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Accounting standards, law original, tax rates and the development of corporate debt security markets

Abstract

In this study, the factors affecting the development of the domestic corporate debt market are investigated and linear models modeling the development are built. It is found that the accounting standards, corporate tax rates and effective legal systems have positive effects on the development of the domestic corporate debt market. The estimated results show that the development of the domestic government debt securities as well as the development of the domestic equity market influence the development of the domestic corporate debt market positively. The regional analysis not shows that claim that Asia Crisis in 1997 resulted from the weak financial systems and the underdeveloped debt markets in Asian countries may not be correct.

Keywords: development, corporate debt market, linear models, accounting standards, legal systems, tax rates, equity market, financial systems, Asia Crisis.
JEL Classification: G15, D53, G39.

Introduction

There are several good reasons for developing corporate debt (bond) market. The most fundamental one is to make financial and capital market more complete by generating market interest rates that reflect the opportunity cost of funds at each maturity. This is essential for efficient investment and financing decisions. Moreover, the existence of tradable instruments helps risk management. Further, the use of financial guarantees and other types of underwriting is becoming increasingly common in corporate debt market as financing deals become more complex. If borrowers have at their disposal only a narrow range of instruments (e.g., in terms of maturity, currency, etc.) then they can be exposed to significant mismatches between their assets and their liabilities.

The corporate bond markets play a significant role in economic development. From the perspective of developing countries, a liquid corporate bond market can play a critical role in supporting economic development. First, it supplements the banking system to meet the requirements of the corporate sector for long-term capital investment and asset creation. Second, it provides a stable source of finance when the equity market is volatile. Third, a well developed liquid corporate debt market has become even more crucial as an alternative source of finance since the decline in the role of development financial institutions (DFIs).

For most countries, where dependence on bank loans is substantial, corporate bond markets are small, marginal and heterogeneous in comparison with corporate bond markets in developed countries. Indeed, an underdeveloped domestic market can push the better-quality issuers abroad, thereby accentuating the problems of developing the corporate debt market. The ability to raise funds efficiently has implications for the overall growth of the economy. The development of the corporate debt market, therefore, remains critical for achieving and sustaining high economic growth rates. Due to the importance that bond markets have to build a sound capital market, governments should lead the process supported by a comprehensive and well-thought framework. Moreover, bond markets are one of the principal means to achieve a developed and sound domestic capital market. Thus, governments have the duty of leading the process of development not only because of their role of developers, but also because as issuers, they are the most important players of capital markets and bond markets in particular. In that sense, policymakers face important questions at developing bond markets: What is the right sequence of development? What are the essential initiatives that have to be addressed to encourage the bond market development? What is the role of the government? This paper provides general policy guidelines and recommendations on these and other thoughtful questions for market development. Liquid public debt markets proved to be key for the development of corporate debt markets as the yield curve associated with government securities markets is important for the correct pricing of corporate bonds. Most countries have developed their fixed-income government securities markets pressed by the necessity of financing fiscal deficits. Are there any other drivers for the development of the corporate debt markets? Currently, there is not any work concentrating on searching for the drivers from an econometric analysis with a comprehensive view and extensive data.

There are numerous differences in the development of regional corporate bond markets in the world. In the US, for instance, the corporate bonds (like mortgage bonds) became popular in the 1980s. However,

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in Greece, the corporate debt market is very limited. The corporate debt markets exhibit a much lower volatility than equities, and all corporate debts are priced based on the same macroeconomic information. The corporate debt market liquidity is normally much higher than the stock market liquidity in most of the countries. The performance of the market for debt is directly related to the interest rate movement as it is reflected in the yields of government bonds, corporate debentures, MIBOR-related commercial papers, and non-convertible debentures.

The fragility of economies during the Asian crisis of 1997-98 was in part attributed to the lack of domestic debt markets that forced infrastructure providers and corporate to borrow overseas to finance longer-term projects (Summers, 1999, Tornell, 2002). An anomaly in the literature is that the development of securities markets has been treated on a unified basis, whereas in Asia, some of the largest equity markets in the world co-exist with nascent debt markets. This article attempts to address this anomaly by looking at the development of domestic corporate debt markets on a global basis to discern the variables that explain their development and to shed some light on debt market development in Asia.

In relation to the development of debt markets, the enforcement of adequate accounting standards as well as prompt and full disclosure are also likely to be highly significant. Thus, banking and regulatory institutions are seen to influence firms' financial decisions. However, the decisions involve the efficiency of legal systems and the relevance of the legal systems to finance which has been highlighted by La Porta et al. (1998). As Mayer and Sussman (2001) point out, it would be expected to see non-market processes where legal systems perform poorly as in Asia and, as a result, less delegation of control from investors to managers, less developed financial markets and more reliance on financial intermediaries than financial markets.

The main goal of this paper is to search for the drivers for the domestic corporate debt market development wich will be helpful for the policymakers who want to build and speed up their corporate debt markets, and also to explore whether or not Asia is different from other regions in terms of the development of its domestic corporate debt markets. It is found that the accounting standards, corporate tax rates and effective legal systems have positive effects on the development of the domestic corporate debt market. The estimated results show that the development of the domestic government debt securities as well as the development of the domestic equity market influence the development of the domestic corporate debt market positively. The regional analysis does not show that Asia Crisis in 1997 resulted from the weak financial systems and the underdeveloped debt markets in Asian countries may not be correct.

1. Frameworks

There are millions of debt securities which will never be paid by the borrowers or issuers in the world. Why do so many investors buy those kinds of useless papers? Why do some countries have so much bigger corporate debt markets than others? For example, the United States has the biggest corporate debt markets with 24% of its GDP value in 2000 among wealthy economies; Malaysia is the number one with 48% of its GDP in 2000 among emerging economies. In earlier studies, such as La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) it is shown that common-law countries give both shareholders and creditors stronger protection than the others do. If the creditors in a market are not protected from the risk of the default well, they will not enter the market. It is possible that the common-law countries have a bigger corporate debt market than the others. It is noticed that the both common law countries, US and Malaysia, have high accounting standards.

Customers want to know the quality of the goods before they buy it. They do not want to be cheated. If they are cheated, they want some agents to represent and speak for them. The asymmetric information exists, between creditors and borrowers in corporate debt markets, in which the borrowers have better knowledge about their assets than the creditors. Therefore, the transparency about the assets and the agency activities is necessary to protect the creditors' assets. However, it is impossible for a company to operate in a perfect transparency state because there are free-riders in the markets. Good accounting practice rules are important to investors to understand the quality of the assets and know the corporate operational, financial and investment activities. Thus, accounting standards may be matter to the development of the corporate debt markets.

Whatever the agency relationship exists, the agency costs incur when an agent has monopoly power over an event, has the discretion to decide its development direction to make himself better off, and the results of the various directions are not accountable. It is a kind of agency behaviors. Corporate agency behaviors result in the agency costs. In general, the less efficient judicial systems result in high agency costs. In order to reduce the agency costs, the monitoring of the management board's activities and the penalty for the illegal activities have to be enforced. The function of laws will be weak if there are no efficient judicial systems to force them. The opaque

accounting system and inefficient legal system lower the security of the property rights and misallocating resources, reduce the quality of agents, increase agency costs, make the regulations be vague and lax. And then, they could negatively affect the smooth operation of the corporations, distort the values, policies and rules and reduce the motivation of the corporate stakeholders to behave because the penalty if caught is avoided or weak.

If we want to sell a product, we need to set a price which makes potential buyers acceptable so that your product can be sold. We need to find a benchmark from the market of similar kinds of goods. The price discovery process in the corporate debt market is not complex if there is a risk free debt with the same maturity. The price can be generated with the risk free rate and the risk premium. In general, government debt securities are treated as risk free debt. Thus, if the government debt market in a country is developed well, the corporate debt securities price formation will be easy. The development of the government debt market could positively impact the development of the corporate debt market.

Price discovery concerning inflation outlook and macroeconomic fundamentals has generally occurred within the government securities market. Government securities have generally been used to price all other debt securities and, in particular, corporate ones. Governments are perceived to provide the best proxy for the risk free rate as they usually carry the AAA rating in local currency terms. In most markets there is a large amount of government debt securities outstanding and governments are generally able to offer a wider range of debt securities than many other borrowers. The existence of well developed repurchase and derivative markets for government securities enables participants to take positions that reflect their views of future interest rates. There are exceptions to these general conditions. For example, before the Asian crisis Indonesia was operating under a balanced budget policy and there were no government bonds on issue that could offer the corporate issuers a benchmark. This was believed to be a major stumbling block for development of the domestic corporate bond market (Rhee, 2000). Increasingly, there is an emerging view that collateralized obligations and interest rate swaps could provide benchmark yield curves, and in the future, the role of government securities may not be so vital to the development of corporate bond markets (Woolridge, 2001).

It is unclear if the development of the corporate debt market is affected by the development of the equity market. Do they develop hand in hand or substitute each other? There are some similarities between debt investors and the equity investors. Both of them face the agency costs and require the transparency and the efficient legal systems.

It may be interesting to see if the people in a richer country buy more corporate debt securities so that it has a bigger corporate debt market. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997) examined if the people in a richer country invest less in equity markets and more in debt markets. The ratio of the sum of bank debt of the private sector and outstanding nonfinancial bonds to GNP was used to measure the development of a debt market. The results of their regression analysis cannot confirm any of them. It is also be investigated if the GDP growth influences the development of debt markets. It was found that the GDP growth positively affects the development of debt markets at the 10% significance level and does not influence on the development of equity markets. Obviously, it keeps interesting to investigate if the GDP growth statistically significantly positively influences the development of the domestic corporate debt markets.

2. Data description and analysis

The data on legal origin are from Foreign Law Encyclopedia Commercial Laws of the World which has been used by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). In the sample, there are 10 countries whose origin of their company laws is the English Common Law, 11 countries whose origin is the French Commercial Code, 7 countries whose origin is the German Commercial Code, 5 countries whose origin is Scandinavian Commercial Code and one country China, whose legal origin is unclear. The details on the legal origin are reported in Table 1 of Appendix A. English origin, French origin, German origin, and Scandinavian origin are numbered as 1, 2, 3 and 4, respectively. The legal origin of China is recorded as zero.

The data on accounting standards are from International Accounting and Auditing Trends, which is used by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) too. The accounting standard is scaled from 0 to 100. The higher it is, the better accounting standard a country has. It is created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items. These items fall into seven categories which are General Information, Income Statements, Balance Sheets, Funds Flow Statement, Accounting Standards, Stock Data and special items. It is used to measure the transparency in this study. The highest standard (83) is held by Sweden and the lowest standard (36) is held by Portugal. The mean is 64.3. The standard deviation is 1.72. The data for China, Hungary and Iceland are generated from The Opacity Index http://www.opacityindex.com/ind_index2.html.

As for The Opacity Index, the higher it is, the worse accounting standard a country has. The accounting standards of China and Hungary are 85 and 65, respectively. Comparing them with the scores of the other countries in two indexes, we set the scores 50 and 54 to China and Hungary. The details on the accounting standards are reported in Table 1 of Appendix A.

The data on the efficiency of judicial systems are from Business International Corporation, which is used by La Porta, Lopez-de-Silanes, Shleifer, and also Vishny (1998). The efficiency of judicial systems is scaled from 0 to 10. The higher mark represents higher efficient systems. 13 countries which score 10 have the perfectly efficient judicial systems. Similar to the accounting standards, the data on the efficiency of judicial systems for China and Hungary are generated from The Opacity Index. The data referring to the effect of legal and judicial opacity are used. In the index, China scores 100 and Hungary scores 48. The scores of China and Hungary in this study are 2.15 and 7 after a series of comparisons and transformations. The details on the efficiency of judicial systems are reported in Table 1 of Appendix A.

The data on the corporate tax rate are from DELOITTE in New Zealand. In the samples, the minimum tax rate 8.5% is held by Switzerland, and the maximum tax rate 40.17 is held by Belgium. The median tax rate of the samples is 30%.

The data on domestic corporate debt securities (CDS) and domestic government debt securities (GDS) are from Bank for International Settlements (BIS). The data on corporate and government debt securities are for twelve years, from 1989 to 2000. BIS regularly publishes domestic and international securities statistics in the annex tables of the BIS Quarterly Review. The data on the domestic debt securities are presented by sector and country of issuer. They include short-term notes, commercial papers, and long-term domestic debt securities. The data on the domestic debt securities are reported for three sectors: Public Sector, Financial Institutions, and Corporate Issuers. In each sector, there are 36 countries data available in 2000. The data for Poland, New Zealand and Russia in the sector of the Corporate Issuers are reported as zeros during the whole period. According to our knowledge, they are not zeros. This can be explained by the fact that some data on corporate bonds, short-term notes and commercial papers have not been collected in those countries. The data for New Zealand in 2000 are from Credit Suisse First Boston (CSFB), which is not zero. There are four countries, Brazil, Greece, Hungary, and Turkey, whose data are recorded as zeros in some years. Because the reported data are kept one digital number and use the unit in billions of US dollars, it is possible that the issued amounts in the corporate debt securities are very small but not zeros in some years in the countries (e.g., 45 millions) so that the reported amounts are zeros. In order to reduce the statistic bias from inaccurate date, the data reported as zeros are not included in our sample sets in this study. As regards the data for Czech Republic, some data on GDP, exchange rate, population, government debt securities are not available either. Thus, Czech Republic is not included in this study. The data for Taiwan are from Economic Research Department of the Central Bank of China.

The data on market equity (ME) are from the table of World Market Capitalization in IFC's Emerging Markets Data Base (EMBD) from 1989 to 2000. The data on Gross Domestic Product (GDP) in local currency, Population and Exchange Rate (EXR) in local currency per US dollar are from International Financial Statistics (IFS) web site: http://imf.largo.apdi.net. The data for Taiwan are from the National Statistics of Taiwan of The Republic of China. All the data as for the end of periods are taken. All available data from above sources are used in this study. 378 observations from 34 countries in 12 years could be used. The details on the data structure are listed in Table 1 of Appendix A. The second column in the table is the number of the years. There are five countries that provide less than 12 years data. They are Brazil, Greece, Hungary, New Zealand and Turkey.

In general, the bigger the country is, the bigger the amount of the domestic corporate debt securities is issued. It may not be suitable to use the amount to measure the development level of the debt market. It is common that the GDP is used as a normalizer (e.g., Beck, Demirguc-Kunt and Levine (1999)). We define the measure of the domestic corporate debt market development as the percentage of the domestic corporate debt securities to GDP (CDSGDP). Similarly, the percentage of the domestic government debt securities to GDP (GDSGDP) is used to measure the development of the government market. And, the percentage of the outstanding market equity to GDP (MEGDP) is used to measure the development of the equity market. The GDP per capita (GDPpc) in the thousands of US dollar is used to measure a country's richness. As in La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997), the GDP growth rate (GDPgrth) is used to measure the change in economic activities. The definitions and summary statistics of CDSGDP, GDSGDP, MEGDP, GDPpc and GDPgrth are presented in Table 1.

Table 1. Variable definitions and summary statistics[a]

Symbol	Definition	Mean	Median	St. Dev.	Minimum	Maximum
CDSGDP	Corporate Debt Security/GDP	6.04	4.41	6.45	0.07	47.69
GDSGDP	Government Debt Security/GDP	38.57	32.80	25.74	1.47	111.53
MEGDP	Market Equity/GDP	68.02	43.89	67.26	0.00	384.39
GDPpc	Per Capita Income in US dollars	17.53	19.69	10.55	0.30	44.86
GDPgrth	GDP growth rate	2.70	2.61	3.91	-19.36	17.91
EJS	Efficiency of Judicial Systems	8.24	9.00	2.01	2.15	10.00
ASD	Accounting Standards	64.65	64.00	9.98	36.00	83.00
Tax	Corporate Tax Rate	28.57	30.00	7.03	8.50	40.17
English	English legal original dummy	0.29	0	0.45	0	1
French	French legal original dummy	0.30	0	0.46	0	1
German	German legal original dummy	0.22	0	0.41	0	1
Scandinavian	Scandinavian legal original dummy	0.16	0	0.37	0	1

Note: [a] Based on the pooled sample of 378 observations for the period (1989-2000). The items with the unit in domestic currencies are transformed in US dollar before the ratios are calculated. GDP growth rates are calculated in domestic currencies after the inflations are deflated.

It can easily be found that the development of the corporate debt markets is far behind the development of the government debt markets and the equity markets. In 2000, Malaysia's corporate debt market is near half its GDP, which is the highest percentage to GDP until now. In our sample, the average size of the government debt markets is more than six times of the corporate debt markets. The average size of the equity markets is more than eleven times of the corporate debt markets even though a lot of countries have their corporate debt markets before they build their equity markets, e.g., China, Iceland, Ireland, and Hungary (see Tables 1, 2 and 3 in Appendix B for details). There are only five countries in the world whose corporate debt markets are more than ten percent of their GDP on average: they are US 23.1%, Malaysia 20.16%, Korea South 18.01%, Japan 12.01% and Switzerland 10.3% (see Table 1 in Appendix B for details). Except Hong Kong, the average sizes of the government debt markets of all other countries are more than ten percent. Belgium has the biggest government debt market which is 103.32% on average (see Table 2 in Appendix B for details). Although Brazil had the biggest issue of the government debt securities in 1993 which is 119.87% of its GDP, this observation is not included in our samples because the data for the corporate debt securities in 1993 are not available so that the maximum of the government debt securities to GDP is 111.53 which is held by Belgium in 1996. In our sample, the richest country is Switzerland. The second is Japan. US is behind Japan, Norway and Denmark on the fifth position. In 2000, US has the highest GDP per capita in our sample set (see Table 4 in Appendix B for details). In other words, US became the richest country in 2000.

The average economic growth rate of the samples is 2.7%. Germany holds the quickest growth (17.91%) in 1991 and the slowest growth (-19.36%) in 1989 among the countries of the samples from 1989 to 2000. The country with the highest average economic growth rate (7.73%) from 1989 to 2000 in our sample is Ireland. The countries following it are China (6.76%), South Korea (5.39%), Malaysia (5.05%) and Singapore (4.5%). On the other hand, Hungary experienced the slowest average economic growth (0.07%) in 12-year period (see Table 5 in Appendix B for details).

Table 2. Correlation analysis

Variable	CDSGDP	GDSGDP	MEGDP	GDPpc	GDPgrth	EJS	ASD	Tax	English	French	German	Variance
CDSGDP	1											41.60
GDSGDP	0.19	1										662.51
MEGDP	0.26	-0.01	1									4523.24
GDPpc	0.17	0.34	0.18	1								111.22
GDPgrth	-0.01	-0.07	0.05	-0.18	1							15.29
EJS	0.23	0.30	0.39	0.70	-0.20	1						4.03
ASD	0.24	0.12	0.40	0.47	-0.06	0.68	1					99.60
Tax	0.06	0.43	-0.32	-0.03	0.00	-0.19	-0.10	1				
English	0.24	0.06	0.38	-0.06	0.05	0.38	0.47	-0.08	1			0.21
French	-0.25	0.24	-0.19	-0.28	-0.01	-0.39	-0.47	0.33	-0.42	1		0.21
German	0.06	-0.20	-0.04	0.15	-0.07	0.03	-0.16	-0.31	-0.34	-0.35	1	0.17
Scandinavian	0.01	-0.05	-0.12	0.40	-0.06	0.25	0.32	0.03	-0.28	-0.29	-0.23	0.13

Table 2 reports the results of Correlation analysis of the samples. The data for time invariant variables legal origins, accounting standards (ASD), the efficiency of judicial systems (EJS) and corporate tax rates (Tax) are pooled with pooling techniques, which each country takes the same value in those variables for all periods even though other variables vary with the time. Because the sample size of the pooled data is 378 and the sample size of the data listed in Table 1 of Appendix A is 34, the variances of the time invariant variables are different in the two tables.

Based on the reported results in Table 2, it can be found that the development of the domestic corporate debt market is positively correlated with the development of the domestic government debt market (GDSGDP), the development of the equity market (MEGDP), the richness of the country (GDPpc), the efficiency of judicial systems (EJS), the accounting standard (ASD) and corporate tax rates (Tax), which is consistent with our expectation and previous findings in the literature on financial market developments. However, the negative correlation between the development of the domestic corporate debt market and the economic growth is not consistent with the findings in La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997) who found the GDP growth significantly positively affects the development of the domestic debt market which is represented by the ratio of the sum of bank debt in private sector and outstanding non-financial debt to GNP in 1994. Anyway, the correlation presented here may not be statistically significant. In the next section, the regression analysis will be done to examine it. The results in Table 2 show that there are positive relationships between English legal origin, German legal origin and Scandinavian legal origin and the development of the domestic corporate debt market. It is interesting to find that there is a negative relationship between French legal origin and the development.

Based on Table 2, it can also be found that the efficiency of judicial systems is strongly correlated with the richness and the accounting standards. It may imply that the rich country's judicial systems are more efficient or the efficient judicial systems make a country richer. Also, it implies that the efficiency of judicial systems and the accounting standards are hand in hand. A country with high efficient judicial systems has high accounting standards and vice versa. The correlation between the accounting standards and the richness of the country is also very high. It implies the richer country has higher accounting standards or the higher accounting standards make the country richer.

The high and positive correlation 0.38 and 0.47 between the efficiency of judicial systems, the accounting standards and the English legal origin implies that the countries with Common Law which is original from English have an efficient judicial system and relatively high accounting standard. On the other hand, the strong and negative correlation -0.39 and -0.47 between the efficiency of judicial systems, the accounting standard and the French legal origin implies that the countries with Civil Law which is original from French have not an efficient judicial system and relatively high accounting standard.

A strong positive correlation 0.39 and 0.40 between the efficiency of judicial systems, the accounting standard and the development of equity markets implies that an efficient judicial system and high accounting standard speed up the development of equity market or the more mature equity market has more efficient judicial system and higher accounting standard. Meanwhile, the high and positive correlation 0.38 between the development of equity market and the English legal origin implies that the Common Law is favorable for the development of equity market or the countries with Common Law have relatively more mature equity markets.

The high and positive correlation 0.43 between the corporate tax rates and the development of government debt markets implies that the high tax rate positively affects the development of government debt markets. On the other hand, the high and negative correlation -0.32 between the corporate tax rates and the development of equity market imply that the low tax rates speed up the development of equity markets.

A strong positive correlation 0.34 and 0.30 between the richness, the efficiency of judicial systems and the development of domestic government debt market implies that the richness and the efficient judicial system help the development of domestic government debt market.

Although the correlation analysis can be helpful in finding the relationship between the variables, it cannot determine if the relationship is statistically significant. In the next section, the regression analysis will be done to confirm these kinds of the relationships.

3. Modeling and empirical estimates

Based on the above analysis, it may be proper to model the development of domestic corporate debt markets as follows:

$$CDSGDP_{it} = \alpha_0 + \alpha_1 GDSGDP_{it} + \alpha_2 MEGDP_{it} + \alpha_3 GDPpc_{it} + \alpha_4 GDPgth_{it} + \alpha_5 EJS_t + \alpha_6 ASD_t + \alpha_7 Tax + \alpha_8 Legal\ Origin\ Dummy_i + \varepsilon_{it}, \quad (1)$$

where *Legal Origin Dummy* = A dummy variable representing legal origin, ε = Disturbance errors. There are several ways to express the Legal Origin Dummy. One is the different legal origin to be treated as the different dummy. The dummy variable matrix is

$$\begin{pmatrix} English & French & German & Scandinavi\ an\ \&\ China \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

In this situation, model (1) will be equivalent to the following model:

$$CDSGDP_{it} = \alpha_0 + \alpha_1 GDSGDP_{it} + \alpha_2 MEGDP_{it} + \alpha_3 GDPpc_{it} + \alpha_4 GDPgth_{it} + \alpha_5 EJS_t + \alpha_6 ASD_t + \alpha_7 Tax + \alpha_{81} English\ Dummy_i + \alpha_{82} French\ Dummy_i + \alpha_{83} German\ Dummy_i + \varepsilon_{it}. \quad (2)$$

Another way to express the Legal Origin Dummy is one legal versus the others. The dummy variable matrix will be:

$$\begin{pmatrix} English & Others \\ 1 & 0 \\ 0 & 1 \end{pmatrix}, \begin{pmatrix} French & Others \\ 1 & 0 \\ 0 & 1 \end{pmatrix}, \begin{pmatrix} German & Others \\ 1 & 0 \\ 0 & 1 \end{pmatrix} \ or \ \begin{pmatrix} Scanadinavian & Others \\ 1 & 0 \\ 0 & 1 \end{pmatrix}.$$

In this situation, there are four possible models to model the effect from the legal origin. They are

$$CDSGDP_{it} = \alpha_0 + \alpha_1 GDSGDP_{it} + \alpha_2 MEGDP_{it} + \alpha_3 GDPpc_{it} + \alpha_4 GDPgth_{it} + \alpha_5 EJS_t + \alpha_6 ASD_t + \alpha_7 Tax + \alpha_{81} English\ Dummy_i + \varepsilon_{it}, \quad (3)$$

$$CDSGDP_{it} = \alpha_0 + \alpha_1 GDSGDP_{it} + \alpha_2 MEGDP_{it} + \alpha_3 GDPpc_{it} + \alpha_4 GDPgth_{it} + \alpha_5 EJS_t + \alpha_6 ASD_t + \alpha_7 Tax + \alpha_{82} French\ Dummy_i + \varepsilon_{it}, \quad (4)$$

$$CDSGDP_{it} = \alpha_0 + \alpha_1 GDSGDP_{it} + \alpha_2 MEGDP_{it} + \alpha_3 GDPpc_{it} + \alpha_4 GDPgth_{it} + \alpha_5 EJS_t + \alpha_6 ASD_t + \alpha_7 Tax + \alpha_{83} German\ Dummy_i + \varepsilon_{it}, \quad (5)$$

$$CDSGDP_{it} = \alpha_0 + \alpha_1 GDSGDP_{it} + \alpha_2 MEGDP_{it} + \alpha_3 GDPpc_{it} + \alpha_4 GDPgth_{it} + \alpha_5 EJS_t + \alpha_6 ASD_t + \alpha_7 Tax + \alpha_{84} Scandinavian\ Dummy_i + \varepsilon_{it}. \quad (6)$$

As the effect of the legal origin can be estimated simultaneously, the estimations of model (2) can be used respectively to compare the different effects of the legal origin. The degree to which the legal origin influences the development of the corporate debt market can be estimated simultaneously. The bigger the estimated coefficient of the legal variable is, the higher the degree of influence on the development is. The estimates of the models (3), (4), (5) and (6) can be used to compare the effect of the one legal origin to the effect of the others in the world. Although the estimates of models (3), (4), (5) and (6) are supplementary and only provide limited statistic information with respect to those of model (2), they are more efficient for the data set to be small.

Because only 12-year data are used in this study, it is significant to analyze the estimating results of models (3), (4), (5) with respect to those of model (2). And then, the estimates of models (3), (4), (5) and (6) can simply provide the information if the English, French, German and Scandinavian legal origins can significanly influence the development of the corporate debt market separately.

The OLS estimates of the models are reported in Table 3. The estimated results of model (2) are reported in column two. In column three, we report the restrictive test results by restricting the variables GDPpc, GDPgrth, EJS, and ASD to be zeros. The F-test with the value 0.6686 does not reject the restriction at the 1% significance level.

Table 3. The estimated results of models (2), (3), (4), (5), (6), (7) and their hypothesis test results

	Model (2)		Model (3)		Model (4)		Model (5)			Model (6)		Model (7)		
	Estimate	Test	Estimate	Test	Estimate	Test	Estimate	Test		Estimate	Test	Estimate	Test	
GDSGDP	0.0527***	0.0484***	0.0300**	0.0386***	0.0580***	0.0509***	0.0422***	0.0381***	0.0428***	0.0338**	0.0367***	0.0342**	0.0366***	0.0316**
	(0.0155)	(0.0133)	(0.0150)	(0.0136)	(0.0152)	(0.0132)	(0.0151)	(0.0135)	(0.0136)	(0.0155)	(0.0138)	(0.0150)	(0.0137)	(0.0146)
MEGDP	0.0238***	0.0226***	0.0196***	0.0215***	0.0260***	(0.0240***	0.0236***	0.0234***	0.0292***	0.0220***	0.0222***	0.0222***	0.0221***	0.0239***
	(0.0055)	(0.0051)	(0.0056)	(0.0053)	(0.0054)	(0.0048)	(0.0055)	(0.0053)	(0.0050)	(0.0058)	(0.0056)	(0.0055)	(0.0054)	(0.0053)
GDPpc	0.0338		0.0875		0.0034		-0.0180			0.0165		0.0145		
	(0.0503)		(0.0495)		(0.0415)		(0.0435)			(0.0459)		(0.0429)		
GDPgrth	-0.0471		-0.0260		-0.0532		-0.0042			-0.0090		-0.0093		
	(0.0803)		(0.0824)		(0.0805)		(0.0820)			(0.0832)		(0.0830)		
EJS	-0.4374		-0.3037		-0.2321		-0.0577			0.0043		0.0063		0.3203*
	(0.2942)		(0.2974)		(0.2732)		(0.2770)			(0.2805)		(0.2796)		(0.1820)
ASD	0.0293		0.0359		0.0071		0.1180***	0.1021***		0.0798*	0.0853**	0.0784*	0.0860***	
	(0.0486)		(0.0466)		(0.0450)		(0.0458)	(0.0345)		(0.0462)	(0.0380)	(0.0446)	(0.0345)	
Tax	0.1484***	0.1520***	0.0799	0.0698	0.1320***	0.1347***	0.1205***	0.1235**	0.1150**	0.0778	0.0732	0.0772	0.0732	0.0849
	(0.0535)	(0.0532)	(0.0532)	(0.0523)	(0.0527)	(0.0517)	(0.0547)	(0.0542)	(0.0547)	(0.0539)	(0.0526)	(0.0537)	(0.0525)	(0.0532)
English	2.0509*	1.5155	2.6742***	2.2450***										
	(1.1339)	(0.9477)	(0.9359)	(0.7427)										
French	-2.9678***	-3.0312***			-4.5096***	-4.1310***								
	(1.0889)	(0.9039)			(0.8377)	(0.7016)								
German	2.0883**	1.8104*					2.7274***	2.5548***	2.2044***					
	(1.0417)	(0.9707)					(0.8562)	(0.8066)	(0.8061)					
Scandinavian										-0.1279	0.0423			
										(1.0310)	(0.9486)			
Constant	-0.7419	-1.6062	-0.7872	0.4511	1.2975	-0.1437	-8.0519***	-7.7015***	-1.3567	-4.4230	-4.4960*	-4.3445	-4.5288*	-1.8686
	(3.2100)	(1.6733)	(2.8953)	(1.5226)	(2.7520)	(1.4786)	(2.8550)	(2.7130)	(1.6791)	(2.7173)	(2.6590)	(2.6391)	(2.5516)	(2.0645)
R^2	0.1986	0.1934	0.1430	0.1303	0.1879	0.1848	0.1475	0.1466	0.1265	0.1241	0.1236	0.1241	0.1236	0.1164
F-value		0.5920		1.3691		0.3496		0.1314	2.2718		0.0719		0.0676	1.0881
Prob		0.6686		0.2441		0.8443		0.9414	0.0611		0.9750		0.9771	0.3540

Note: Dependent variable is CDSGDP. Standard errors of estimate are in parentheses. * indicates significance at 10% level. ** indicates significance at 5% level. *** indicates significance at 1% level. The hypothesis of the tests is that the coefficients of the variables GDPpc, GDPgrth, EJS and ASD are zeros. Prob represents the probability of the hypothesis to be true.

Following the results of model (2), we reported the estimated results and the restrictive test results for models (3), (4), (5) and (6) accordingly. Based on the results, we can find that GDP per capita (GDPpc), GDP growth rate (GDPgrth), and the efficiency of Judicial Systems (EJS) do not statistically significantly influence the development of the domestic corporate debt market. As for models (3) and (4), the tests of the hypothesis that the coefficients of the variables GDPpc, GDPgrth, EJS and ASD are zeros are not rejected at 5% significance level. As regards models (5) and (6), the tests of the hypothesis that the coefficients of the variables GDPpc, GDPgrth, and EJS are zeros are not rejected at 5% significance level. However, as for model (5), the test of the hypothesis that the coefficients of the variables GDPpc, GDPgrth, EJS and ASD are zeros is rejected at 5% significance level because the estimate of the coefficient of ASD is significant at 5% significance level.

Based on the regression results and the test results in Table 3, we can find that the development of the government debt market has a positive effect on the development of the domestic corporate debt market, which confirms the pricing discovering function of the government debt securities in corporate debt securities issuing in some ways.

The results show that the development of the equity market influences the development of the domestic corporate debt market positively too. Their developments are hand in hand. Although the corporate debt financing at some stages has substituting effects for the corporate equity financing, the results in this study confirm that the substituting effects are not so strong to make a firm forget to construct an optimum capital structure. The results are consistent with the previous findings that many companies issue debts and shares in the same year to finance their growth and common cash dividend payment for its optimum capital structure. The results also imply that financial distress makes a lot of firms to give up cheaper debt financing. The development of the equity market provides some frameworks, rules and standards for the development of the corporate debt market. Also, because the information for listed companies are publicly available, it is easier for them to rise fund by issuing the corporate debt securities as compared with unlisted companies. In general, the public listed companies prefer the corporate debt securities to bank loans because the bank loans are subject to a lot of strict restrictions for usages and payback procedures. It is possible that the both markets get the similar support from the same authorities. Therefore, it is acceptable that the development of the equity market and the development of the corporate debt market are hand in hand.

Based on the results, it can be found that the corporate tax rates may affect the development of the domestic corporate debt market positively too.

Based on the sizes of the coefficients of the legal origin dummy variables in Table 3, we can order the legal families, from favorable to unfavorable, for the development of the domestic corporate debt market as follows: English Legal Origin, German Legal Origin, Scandinavian Legal Origin and French Legal Origin. It keeps interesting to investigate why the legal systems originating from English or German are favorable and the legal systems originating from French are unfavorable for the development of the domestic corporate debt markets.

Comparing the estimate of the coefficient of the independent variable GDSGDP with that of the independent variable MEGDP for all models respectively, we can find that the former is almost two times as big as the latter, which means that the marginal effect for the development of the corporate debt market from the change of the development of the government debt market is about four times as big as that from the development of the equity market. The difference of the marginal effects from the development of both markets provides the important referee for policy makers who want to improve the development level of the domestic corporate debt market.

Although the estimate of the coefficient of the independent variable Accounting Standard (ASD) is not significant in models (2), (3) and (4), it is statistically significant in models (5) and (6). The results imply that the dummy variables English and French have explained the part of the functions of the accounting standards with respect to the development, and the dummy variables German and Scand have not, which is consistent with the results of the correlation analysis.

La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) found that Civil-law dummy had strong explanatory power for the efficiency of judicial systems and the accounting standards which are statistically significantly negative, which implies that English Common-law dummy will have strong explanatory power for the efficiency of judicial systems and the accounting standards which should be statistically significantly positive. Also, they found that French Legal Origin dummy had strong explanatory power for the efficiency of judicial systems and the accounting standards which are statistically significantly negative. The results from models (2), (3) and (4) are consistent with their findings. The English Common-law dummy and the French legal origin dummy have statistically significantly explained the development of the domestic corpo-

rate debt markets so that the variables the efficiency of judicial systems and the accounting standard have little power to explain the development. They also found that Scandinavian Legal Origin dummy had little power to explain the efficiency of judicial systems and the accounting standard.

Therefore, based on the results of models (5) and (6), we can say that the accounting standards statistically significantly positively affect the development, which is consistent with our expectation. On the other hand, the effect from the efficiency of judicial systems is not significant. The explanatory power of the variable Accounting Standard in models (2), (3) and (4) may be substituted by the legal origin dummy English and/or French so that the variable is not significant. The result for German Legal Origin dummy in this study is different from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998)'s finding that the dummy statistically significantly negatively affects the accounting standard. In Table 2, it can be found that the correlation between the dummy and the accounting standard is -0.16, which has the right sign but very weak. That the accounting standard statistically significantly positively explains the development implies that the dummy has very limited power to explain the accounting standard. One cannot substitute the other.

It is necessary further to investigate the functions of the variables after deleting the legal origin dummies from the models because they have power to explain the efficiency of judicial systems and the accounting standards. Furthermore, as the efficiency of judicial systems and the accounting standards are highly correlated, it may be interesting to see if the variable Efficiency of Judicial Systems has the similar power to drive the development as the variable Accounting Standards does. The model without including legal original dummy variables is as follows:

$$CDSGDP_{it} = \alpha_0 + \alpha_1 GDSGDP_{it} + \alpha_2 MEGDP_{it} + \alpha_3 GDPpc_{it} + \alpha_4 GDPgth_{it} + \alpha_5 EJS_t + \alpha_6 ASD_t + \alpha_7 Tax + \varepsilon_{it}. \quad (7)$$

The estimated results of model (7) are reported in Table 3 too. It can be found that the variables GDSGDP, MEGDP and ASD are still statistically significant. The results show that the variables GDPpc, GDPgrth and EJS do not statistically significantly affect the development. The hypothesis that the GDPpc, GDPgrth and EJS do not influence the development is not rejected. Based on the results in Table 2 that the variable Efficiency of Judicial Systems is highly correlated with the variable Accounting Standards, we test the hypothesis that the coefficients of the variables GDPpc, GDPgrth, and ASD are zeros. The test does not reject the hypothesis. The estimate of the coefficient of the variable Efficiency of Judicial Systems is statistically significant at the 10% significance level. The result implies that the Efficiency of Judicial Systems also positively influences the development in some ways. Anyway, based on the probabilities 0.9771 and 0.354 and the values of R^2 0.1236 and 0.1164 which are reported in the last two columns, we can say that the variable ASD explains the development better than the variable EJS does.

Because the explanatory variable MEGDP may also be explained by the other variables in the models, people may worry about if there is multi-collinearity in the models. The multi-collinearity is a statistical phenomenon in which two or more explanatory variables in the model are highly correlated. In this situation the estimates of the models may change erratically in response to small changes in the model or the data. The multi-collinearity affects the estimates of the explanatory variables. And then, all inferences from the estimates may be incorrect. This issue is examined. The tests versus models (2), (3), (4), (5), (6) and (7) with the hypothesis that the coefficient of the variable MEGDP is zero are done. The hypothesis that MEGDP is zero is rejected in all models. Therefore, the estimated results reported are reliable, and the policy inferences based on the results will be significantly reliable.

4. The regional analysis of domestic corporate debt markets

It is claimed that Asia Crisis in 1997 was caused by weak financial systems and the underdeveloped debt markets in Asian countries. It is interesting to investigate if the development of the domestic corporate debt markets in Asia is behind the development of the rest of the world. Based on the samples from 34 countries, we will try to shed light on this issue.

The first group data are generated to test if the development of the domestic corporate debt markets in Asia is different from the development in the rest of the world. There are eight countries in the Asia data set: China, Hong Kong, India, Japan, South Korea, Malaysia, Singapore and Taiwan. There are 96 observations in the set because all observations are available for those countries in the period from 1989 to 2000. There are 26 countries in the Non-Asia data set. The number of the observations is 282. The means and the variances of the two data sets are reported in Table 4. It can be found that the means of Asia countries are more than four times higher than those of the rest of the world. Its variance is more than twenty times higher. The results of F-test

two sample for the same variance are reported in Table 4 too. F-test with the value 23.5643 statistically rejected the hypothesis that the two samples have the same variance. The results of t-test of two samples for the same mean assuming unequal variances are reported in the third part of Table 4. t-test with the value of 8.723303 statistically rejected the hypothesis that the two samples have the same mean. It may be interesting to see if the result of the test will be different by assuming the two samples having the equal variances. The results of t-test are reported in the fourth part of Table 4. With the value of the t-test 14.2308, the hypothesis is statistically rejected too. Therefore, the development of the domestic corporate debt markets in Asia is far better than that of the rest of the world, even though the development is not balance, which is represented by statistically significantly bigger mean and variance.

Table 4. The regional analysis of domestic corporate debt markets

	Asia	Non-Asia	Asia_E	Non-Asia_E	Emerging	Developed
Mean	27.3282	5.3654	7.4666	2.5585	5.3255	6.5101
Variance	599.8651	25.4565	93.0207	8.2020	61.6783	28.1885
Observations	96	282	84	65	149	229
F-test for the same variances						
Degree of freedom	95	281	83	64	148	228
Value of F-test	23.5643		11.3413		2.1881	
t-test: for the same mean assuming unequal variances						
Degree of freedom	98		101		236	
Value of t-test	8.7233		4.4191		-1.6165	
t-test for the same mean assuming equal variances						
Pooled variance	170.5863 376 14.2308		56.0928 147 3.9670		41.3707 376 -1.7499	

The second group data are generated to test if the development of Asian emerging domestic corporate debt markets is different from the development in the other emerging markets. The data for Asian emerging domestic corporate debt markets are noted as Asia_E. The data for the other emerging domestic corporate debt markets are noted as Non-Asia_E. The means and the variances are reported in Table 4 with respect to the above names. The similar tests for the data as for the first group data are done and the results are reported in Table 4 too. It is easy to find that the development of the Asian emerging domestic corporate debt markets is far better than the development of the other emerging domestic corporate debt markets.

The third group data are generated to test if the development of the emerging domestic corporate debt markets is different from the development in the other markets which consist of developed countries. The data for the emerging domestic corporate debt markets are noted as Emerging, and the data for the other are noted as Developed. Although F-test two-sample for the same variances is rejected, the t-tests for two samples for the same mean whether the variances are assumed to be equal or not are not statistically rejected at the 5% significance level. Therefore, the development in the emerging markets is not statistically significantly different from that in the rest of the world.

Conclusions

In summary, the development of the domestic government debt market as well as the development of the domestic equity market have positive effects on the development of the domestic corporate debt market. The results show that high accounting standards are better off for the development of the domestic corporate debt market. Also, legal origin affects the development of the domestic corporate debt market, the investment legal environment has positive effect on the development of the domestic corporate debt market. If the investors are well protected, the development of the domestic corporate debt market is well. Based on the regional analysis, we have found that the development of the domestic corporate debt markets in Asia is far better than the development of the rest of the world although the development is not balanced; the development of the Asian emerging domestic corporate debt markets is far better than the development of the other emerging domestic corporate debt markets and the development in the emerging markets is not statistically significantly different from the development in the rest of the world. Therefore, the claim that Asia Crisis in 1997 resulted from the weak financial systems and the underdeveloped debt markets in Asian countries may not be correct. It keeps unclear that the GDP growth speeds up the development of financial markets or vice versa. It will be interesting to make this issue clear.

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Appendix A

Table 1. The data structure of time invariant samples

Country	Years	Accounting standard	Efficiency of judicial systems	Legal origin	Emerging market dummy
Australia	12	75	10	1	0
Austria	12	54	9.5	3	0
Belgium	12	61	9.5	2	0
Brazil	5	54	5.75	2	1
Canada	12	74	9.25	1	0
Chile	12	52	7.25	2	1
China	12	50	2.15	0	1
Denmark	12	62	10	4	0
Finland	12	77	10	4	0
France	12	69	8	2	0
Germany	12	62	9	3	0
Greece	5	55	7	2	1
Hong Kong	12	69	10	1	1
Hungary	10	54	7	3	1
Iceland	12	64	7	4	0
India	12	57	8	1	1
Ireland	12	70	8.75	1	0
Italy	12	62	6.75	2	0
Japan	12	65	10	3	0
South Korea	12	62	6	3	1
Malaysia	12	76	9	1	1
Mexico	12	60	6	2	1
Netherlands	12	64	10	2	0
New Zealand	1	70	10	1	0
Norway	12	74	10	4	0
Portugal	12	36	5.5	2	1

Table 1 (cont.). The data structure of time invariant samples

Country	Years	Accounting standard	Efficiency of judicial systems	Legal origin	Emerging market dummy
Singapore	12	78	10	1	1
Spain	12	64	6.25	2	0
Sweden	12	83	10	4	0
Switzerland	12	68	10	3	0
Taiwan	12	65	6.75	3	1
Turkey	9	51	4	2	1
United Kingdom	12	78	10	1	0
United States	12	71	10	1	0
Mean	11.12	64.29	8.19		
Median	12	64	9		
Standard deviation	2.50	10.06	2.05		
Sample variance	6.23	101.12	4.20		
Minimum	1	36	2.15		
Maximum	12	83	10		

Note: English origin, French origin, German origin, and Scandinavian origin are numbered as 1, 2, 3 and 4, respectively. The legal origin of China is recorded as zero.

Appendix B

Table 1. Domestic corporate bond to GDP
(percentage at the end of period)

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Ave.
US	22.18	22.24	22.95	23.27	23.60	22.66	22.93	22.87	22.69	23.66	24.05	24.10	23.10
Malaysia	4.37	5.22	6.05	8.32	9.57	14.93	17.82	23.42	28.72	32.59	43.24	47.69	20.16
South Korea	11.14	13.54	14.97	14.47	14.44	14.83	16.24	18.24	19.89	27.61	24.78	25.99	18.01
Japan	10.07	9.33	8.99	9.90	10.63	10.70	11.33	12.20	12.51	15.24	16.22	16.97	12.01
Switzerland	6.01	10.82	7.96	8.42	8.16	7.96	13.46	12.37	12.15	12.36	12.30	11.65	10.30
Denmark	4.36	4.97	5.24	7.33	8.05	7.43	9.06	9.08	10.09	10.33	9.63	8.86	7.87
Iceland	3.97	4.51	2.79	3.19	3.53	4.67	4.34	5.53	8.25	15.61	18.62	15.18	7.52
Finland	9.49	9.80	10.26	10.34	9.39	7.45	5.71	5.63	4.69	4.80	6.03	5.80	7.45
Portugal	3.76	4.47	4.15	4.72	5.52	6.20	7.85	9.49	9.34	10.09	10.23	9.80	7.14
Belgium	7.12	6.81	6.34	6.93	6.80	6.54	6.51	6.61	6.56	6.40	8.05	8.61	6.94
Canada	5.04	5.81	5.71	5.71	5.50	5.74	6.04	6.57	7.87	8.71	9.72	10.24	6.89
New Zealand	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	6.20	6.20
Australia	4.65	4.47	4.41	4.99	4.35	4.27	4.51	5.80	7.45	7.62	9.42	11.43	6.11
Sweden	7.53	6.54	5.65	6.59	6.20	3.83	3.89	4.62	5.43	6.78	7.69	8.01	6.06
India	2.13	1.53	2.85	2.14	8.22	9.35	8.07	8.05	7.65	6.76	6.22	6.07	5.75
UK	3.57	2.93	2.79	3.61	3.94	4.14	4.41	4.60	5.76	8.15	10.33	13.20	5.62
France	3.47	4.10	4.02	4.60	4.35	4.15	3.92	5.31	5.09	5.47	7.54	9.40	5.12
Spain	5.70	6.98	5.77	6.59	5.65	4.17	3.58	3.33	2.94	3.42	4.42	4.75	4.77
Ireland	1.77	2.36	3.08	5.06	6.04	4.06	3.31	2.09	5.04	5.99	7.49	9.76	4.67
Chile	3.63	5.10	5.89	5.29	5.28	4.72	3.78	3.46	2.65	3.24	4.00	4.85	4.32
Netherlands	2.96	3.18	3.00	3.33	3.39	3.42	3.41	3.82	3.96	4.40	6.50	10.22	4.30
Singapore	4.88	4.46	3.97	4.11	3.45	3.42	2.99	2.72	2.50	2.52	2.43	2.18	3.30
Taiwan	1.15	1.20	1.35	1.25	1.02	1.09	1.31	3.26	3.88	5.81	6.35	7.32	2.92
Norway	1.84	2.29	1.96	1.94	2.19	2.42	2.45	2.28	2.34	2.19	2.29	2.46	2.22
Austria	1.69	1.65	1.43	1.49	1.71	1.91	2.13	1.70	1.86	1.98	1.87	1.72	1.76
Hong Kong	0.45	0.67	0.81	0.89	0.26	0.08	1.36	1.23	1.46	2.21	2.52	3.00	1.25
Mexico	1.11	0.80	0.71	0.75	0.96	0.90	0.67	0.53	1.04	1.31	1.31	1.41	0.96
China	1.06	1.14	1.58	1.33	0.96	0.71	0.58	0.52	0.70	0.65	0.64	0.58	0.87
Hungary	n.a.	n.a.	0.30	0.57	0.28	0.25	0.50	0.48	1.67	1.09	1.33	1.55	0.80
Turkey	0.63	0.45	0.40	1.25	2.39	0.60	0.92	0.07	0.07	n.a.	n.a.	n.a.	0.75
Italy	0.49	0.37	0.27	0.25	0.25	0.36	0.39	0.43	0.49	0.52	1.01	2.09	0.58
Germany	0.11	0.10	0.35	0.64	0.48	0.27	0.24	0.26	0.35	0.39	0.72	1.33	0.44
Brazil	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.15	0.58	0.32	0.41	0.38	0.37
Greece	0.29	0.12	0.11	n.a.	n.a.	n.a.	0.09	n.a.	0.09	n.a.	n.a.	n.a.	0.14

Table 2. Domestic government bond
(percentage at the end of period)

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Ave.
Belgium	91.64	94.85	94.15	111.39	109.98	104.99	108.42	111.53	108.34	103.47	100.87	100.17	103.32
Italy	73.07	75.89	76.31	101.88	102.60	105.83	103.68	102.83	99.50	96.73	94.72	89.99	93.59
US	74.39	78.37	84.32	87.23	90.00	90.11	90.22	90.01	87.68	87.08	86.84	80.64	85.58
Japan	61.94	54.04	52.30	56.80	61.21	65.18	69.95	73.63	76.77	82.18	93.42	101.99	70.78
Canada	60.26	64.85	71.83	77.95	78.11	76.27	76.54	74.56	71.16	67.75	65.78	59.82	70.41
Greece	37.80	50.13	50.87	65.41	71.93	69.18	72.76	82.11	80.16	78.30	76.97	77.59	67.77
Denmark	46.08	46.19	49.37	59.04	63.88	63.05	64.32	63.21	59.74	56.16	52.77	47.67	55.96
Singapore	70.97	62.73	57.99	77.55	66.15	57.65	55.40	57.42	15.63	20.62	24.53	22.20	49.07
Sweden	26.37	28.12	38.85	52.61	53.51	56.93	56.31	55.90	53.13	55.65	53.78	48.25	48.29
Netherlands	34.94	37.06	38.26	47.24	50.14	47.65	50.91	52.66	50.90	50.18	47.95	43.57	15.96
Spain	31.76	32.82	31.69	38.59	47.13	45.15	46.72	52.37	54.20	52.11	49.97	48.64	44.26
Brazil	n.a.	n.a.	n.a.	31.91	19.87	24.61	22.60	29.02	33.87	37.42	43.27	43.78	42.93
Malaysia	60.12	56.26	51.61	48.88	48.64	41.13	37.02	30.10	26.78	30.32	31.32	31.12	41.11
Portugal	40.63	40.53	42.10	45.78	46.62	42.99	43.40	42.43	37.47	34.46	33.40	33.74	40.30
Ireland	50.31	45.89	43.72	45.55	44.54	41.30	39.11	37.80	34.05	28.52	28.38	22.43	38.47
France	21.87	23.43	23.24	30.70	35.42	37.73	40.97	44.12	45.87	48.01	47.71	48.61	37.31
Germany	19.85	22.72	20.86	28.70	35.46	36.73	35.90	37.01	38.00	38.28	38.96	38.95	32.62
Austria	21.99	24.61	24.39	27.93	30.85	31.22	31.66	32.95	35.69	36.48	43.94	47.46	32.43
New Zealand	31.88	28.85	33.96	34.87	32.72	34.04	32.21	31.86	29.75	30.93	30.43	29.57	31.76
UK	27.15	21.98	21.91	30.36	32.75	33.51	37.30	36.40	34.94	32.77	32.08	30.59	30.98
Chile	19.76	29.15	32.53	32.98	32.13	31.92	29.74	31.72	33.44	29.72	31.41	32.14	30.55
Australia	23.66	21.91	25.47	33.71	34.15	36.22	33.53	30.92	27.64	24.89	22.89	19.14	27.85
Finland	6.06	5.56	8.69	14.97	21.02	25.88	33.43	37.81	39.41	38.36	38.09	34.93	25.35
Norway	23.85	22.23	20.50	26.29	29.66	27.20	27.08	25.22	24.56	23.57	22.65	17.66	24.21
Iceland	13.89	15.03	16.72	22.35	26.48	26.46	27.46	27.64	28.89	28.81	27.92	24.04	23.81
Hungary	2.54	2.35	4.54	16.84	29.52	30.18	28.57	35.41	30.98	32.79	34.80	34.27	23.56
India	20.57	21.58	19.02	16.69	19.10	18.89	19.53	20.55	18.76	20.17	22.22	25.27	20.20
Switzerland	7.22	8.08	8.57	14.20	17.05	18.05	19.54	20.87	21.40	22.69	24.67	21.41	16.98
Turkey	7.46	7.02	7.96	14.50	16.14	15.42	15.52	19.26	21.11	22.03	28.07	28.91	16.95
Mexico	23.48	22.48	18.09	11.82	10.73	12.00	7.32	5.75	7.84	7.46	9.48	9.73	12.18
South Korea	10.04	8.17	9.70	10.01	9.70	8.73	8.48	8.86	9.50	13.87	17.14	17.92	11.01
Taiwan	5.66	4.38	7.23	10.33	12.20	12.34	12.36	12.98	12.42	11.68	13.40	15.32	10.86
China	6.54	5.42	5.54	7.32	7.51	8.34	9.33	10.27	12.45	14.59	17.57	16.04	10.08
Hong Kong	1.49	1.47	2.33	2.78	3.19	5.28	6.17	7.92	7.84	8.18	9.40	10.24	5.52

Table 3. Equity outstanding to GDP
(percentage at the end of period)

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Ave.
Hong Kong	115.49	111.68	141.98	170.99	331.65	206.30	218.01	291.67	241.84	211.22	384.39	382.17	233.95
Malaysia	102.36	110.28	118.19	162.95	345.67	261.00	254.49	306.17	129.24	131.65	184.44	130.92	186.45
Switzerland	90.13	65.34	70.64	83.05	114.92	104.23	137.31	147.99	225.46	249.04	285.04	318.26	157.62
Singapore	116.96	90.05	105.04	100.43	229.26	184.19	177.10	163.35	126.82	113.24	229.58	166.31	150.19
UK	100.31	79.16	90.35	100.82	121.61	114.31	127.20	135.56	149.87	167.59	203.67	184.82	131.27
US	63.87	52.72	68.28	70.98	77.33	71.83	92.66	108.59	136.24	153.03	178.89	151.60	102.17
Netherlands	62.36	39.22	42.95	43.13	60.96	80.78	89.40	99.78	134.43	151.79	185.08	171.83	96.81
Taiwan	156.75	62.27	66.19	47.67	86.94	100.41	72.73	97.96	112.79	93.71	127.07	84.53	92.42
Chile	38.67	49.72	86.69	74.64	107.00	128.80	116.21	99.13	100.38	73.07	105.06	91.57	89.24
Sweden	60.26	41.03	38.55	38.29	61.65	61.20	69.19	96.71	118.49	118.86	161.36	150.32	84.66
Japan	153.84	88.74	83.54	62.14	68.96	75.44	75.76	70.15	55.20	55.93	90.67	70.88	79.27
Finland	25.09	15.79	11.81	13.14	27.67	34.76	34.08	50.00	62.54	114.20	288.69	239.66	76.45
Canada	51.83	41.93	45.59	44.22	59.63	57.58	61.97	79.86	92.82	92.22	120.68	121.51	72.49
Australia	48.19	35.35	48.88	50.48	69.06	60.70	66.96	75.08	82.50	92.52	107.12	102.64	69.96
Greece	9.23	186.16	14.17	10.85	14.53	14.94	14.85	19.95	29.17	63.01	175.82	99.08	54.31
Belgium	42.80	30.75	32.28	29.27	37.94	34.36	37.96	46.05	57.94	93.52	78.81	79.72	50.12

Table 3 (cont.). Equity outstanding to GDP
(percentage at the end of period)

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Ave.
France	33.66	24.34	26.15	27.14	37.19	32.22	32.97	38.91	49.21	65.09	108.81	110.62	48.86
New Zealand	31.61	20.56	36.33	39.65	56.20	48.51	52.77	56.48	52.46	47.05	51.98	38.22	44.32
Spain	29.88	21.53	26.04	19.19	27.83	31.48	34.41	43.22	56.55	69.39	76.31	89.38	43.77
South Korea	64.63	44.31	33.86	34.48	40.60	46.77	37.36	28.00	17.22	32.83	93.27	41.96	42.94
Denmark	33.64	27.34	30.92	22.99	31.44	34.27	30.88	40.17	57.34	54.02	63.36	65.81	41.01
Brazil	45.81	9.12	27.57	31.81	83.64	45.86	22.23	28.96	32.76	21.28	42.44	40.57	36.00
Germany	27.88	21.82	20.30	17.81	24.73	21.47	23.49	29.09	40.33	48.36	71.92	67.17	34.53
Mexico	10.85	13.04	31.77	38.50	49.62	48.84	37.73	33.12	39.88	23.52	31.94	22.06	31.74
Norway	24.51	21.36	17.25	15.72	24.99	28.42	30.34	36.39	44.38	32.16	42.93	41.02	29.96
India	9.54	12.26	18.87	22.83	35.78	39.62	37.86	32.34	33.29	25.41	41.02	34.99	28.65
Portugal	19.00	12.47	11.40	10.60	16.31	17.69	17.36	22.94	39.99	56.21	61.86	57.19	28.58
Italy	17.98	12.73	12.69	12.52	14.84	17.76	18.58	20.77	30.41	45.34	65.44	70.84	28.33
Turkey	7.13	14.23	12.50	7.74	26.31	21.63	15.96	21.90	43.56	19.77	73.59	36.81	25.09
Iceland	0.00	0.00	0.00	0.00	0.00	7.53	10.41	16.72	25.57	37.29	55.93	56.17	17.47
China	0.00	0.00	0.52	4.06	6.82	7.87	5.98	13.81	22.81	23.98	33.37	53.79	14.42
Austria	15.69	6.76	4.22	12.00	16.25	14.84	13.84	15.18	17.96	15.32	16.68	15.61	13.70
Hungary	0.00	0.00	1.53	1.60	2.30	4.07	5.96	12.62	35.68	30.46	36.17	26.58	13.08
Ireland	0.00	0.00	0.00	0.00	0.00	0.34	0.3129	0.28	0.23	0.20	0.10	0.07	0.13

Table 4. GDP per capita
(percentage at the end of period in thousands of US dollars)

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Ave.
Switzerland	28.52	36.50	36.20	34.18	34.07	38.99	44.86	38.43	35.99	38.92	34.11	34.72	36.29
Japan	23.20	26.63	30.23	31.03	34.85	39.39	38.58	35.01	31.85	35.30	39.60	35.11	33.40
Norway	24.39	28.85	30.00	26.42	25.42	29.70	33.71	36.03	33.98	32.95	33.27	35.31	30.84
Denmark	23.26	27.80	28.16	27.45	25.61	30.53	34.81	33.93	30.97	34.54	31.18	30.64	29.91
US	22.19	23.22	23.69	24.74	25.74	27.07	28.13	29.43	30.97	32.49	34.10	35.40	28.10
Iceland	20.15	26.61	27.61	24.09	21.79	23.80	25.63	26.80	26.92	30.85	30.70	28.23	26.10
Sweden	23.32	27.88	30.37	23.61	19.97	24.37	29.14	28.92	26.01	26.50	26.11	24.63	25.90
Germany	16.65	20.51	24.23	24.26	23.08	26.92	30.10	28.16	24.93	27.58	24.26	23.06	24.48
Austria	18.53	21.97	23.31	22.91	21.91	25.41	29.19	27.75	24.65	27.55	24.47	23.67	24.28
France	19.21	22.76	23.33	22.54	21.27	24.19	27.24	26.02	23.38	25.89	22.94	22.21	23.42
Finland	24.63	28.84	24.12	18.42	16.80	21.63	25.35	24.64	22.81	26.27	23.41	23.65	23.38
Belgium	17.53	21.35	22.14	21.81	20.41	24.26	27.27	25.61	23.22	25.73	22.94	22.33	22.88
Netherlands	17.04	20.43	21.04	20.56	19.51	22.80	25.79	24.44	22.35	25.29	23.76	23.50	22.21
Canada	20.60	20.83	20.88	19.36	19.08	18.84	20.14	22.52	20.39	19.48	21.77	22.52	20.37
Hong Kong	11.79	13.10	14.94	17.35	19.69	21.63	22.62	24.42	26.05	24.48	23.58	23.99	20.30
UK	14.37	18.63	18.92	15.85	16.27	18.13	18.88	21.83	22.57	23.92	24.21	23.43	19.75
Italy	16.37	20.27	22.05	18.15	16.08	17.74	19.68	21.66	19.64	21.85	19.34	18.85	19.31
Singapore	10.48	12.62	14.68	15.29	17.76	21.74	24.08	25.47	22.42	21.56	22.22	22.87	19.26
Australia	17.40	17.84	17.58	16.38	16.79	20.20	20.27	22.69	19.36	18.98	21.05	18.90	18.95
Ireland	11.27	14.51	14.71	14.47	13.46	15.78	18.47	21.13	20.62	24.35	23.49	25.40	18.14
New Zealand	12.81	12.79	11.34	11.03	12.83	15.58	16.54	18.44	15.47	13.99	14.32	12.67	13.98
Spain	10.58	13.32	14.60	13.22	10.96	12.57	14.66	14.30	13.06	14.72	14.35	14.29	13.39
Taiwan	7.56	7.99	9.22	10.27	10.69	11.63	12.05	12.98	11.74	12.65	13.39	13.15	11.11
Greece	6.84	8.21	9.03	8.47	8.17	9.58	10.99	11.56	11.16	12.07	10.97	11.18	9.85
Portugal	5.62	7.45	8.54	8.81	7.71	9.28	10.66	10.82	9.80	11.23	10.87	10.60	9.28
South Korea	5.14	5.82	6.57	7.12	7.77	9.19	10.80	10.89	5.81	7.95	9.05	8.65	7.90
Mexico	2.54	3.01	3.64	4.18	4.60	2.98	2.66	3.47	4.17	4.07	4.91	5.83	3.84
Hungary	2.65	3.28	3.19	3.40	3.42	3.84	3.93	4.10	4.13	4.56	4.48	4.51	3.79
Chile	1.91	2.10	2.42	2.93	3.03	3.78	4.48	4.61	4.91	4.79	4.32	4.34	3.64
Malaysia	2.20	2.44	2.67	3.03	3.26	3.80	4.23	4.74	3.34	3.38	3.47	3.84	3.37
Brazil	0.68	1.24	1.05	0.95	0.78	2.69	4.26	4.75	4.89	4.67	3.28	3.36	2.72
Turkey	1.73	2.39	2.20	2.21	2.44	1.67	2.15	2.23	2.25	2.69	2.38	2.81	2.26

Table 4 (cont.). GDP per capita
(percentage at the end of period in thousands of US dollars)

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Ave.
China	0.31	0.30	0.33	0.38	0.50	0.46	0.58	0.67	0.73	0.77	0.78	0.83	0.55
India	0.35	0.38	0.30	0.37	0.31	0.36	0.36	0.40	0.40	0.43	0.46	0.43	0.37

Table 5. GDP per capita growth rate
(percentage at the end of period in local currency)

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Ave.
Ireland	8.37	9.26	-0.30	2.45	5.90	4.48	9.98	7.42	13.08	10.89	10.65	10.61	7.73
China	-6.80	6.45	10.77	12.99	15.17	7.81	6.17	6.76	5.61	6.54	3.31	6.29	6.76
South Korea	5.08	10.03	9.69	5.72	6.73	8.62	10.54	4.65	2.70	-9.68	6.77	3.84	5.39
Malaysia	6.28	7.60	6.09	3.70	7.44	6.44	7.04	7.60	5.77	-6.38	0.13	8.92	5.05
Singapore	9.05	7.11	5.14	2.75	11.04	7.83	5.47	3.26	3.26	-4.44	3.38	5.56	4.95
Taiwan	7.21	3.42	6.34	6.27	4.24	5.48	2.95	5.87	7.11	4.21	3.02	1.47	4.80
Portugal	5.27	4.25	3.42	3.50	-1.30	3.27	3.62	3.05	3.89	4.54	9.79	2.36	3.81
Norway	1.55	1.49	1.66	-0.24	2.13	3.63	3.53	7.60	4.40	-1.48	4.37	13.34	3.50
Chile	4.46	-1.31	5.69	6.95	3.25	5.13	10.09	0.21	3.78	-0.01	-2.27	4.36	3.36
Spain	4.84	4.15	3.21	1.35	-1.58	1.39	2.70	1.89	3.46	4.06	10.66	3.96	3.34
India	6.23	4.75	-1.11	0.34	5.97	4.56	4.10	3.76	2.14	0.80	4.65	-3.25	2.74
Mexico	11.29	4.29	2.78	0.75	-0.13	3.83	-5.17	-0.15	2.48	2.88	-0.13	8.98	2.64
Netherlands	4.19	3.27	1.02	0.45	-1.01	1.61	2.63	0.95	3.57	3.90	6.73	4.16	2.62
Greece	3.99	-0.50	2.46	-0.89	-2.13	1.81	4.04	1.30	4.58	3.24	2.93	9.96	2.57
Belgium	5.08	1.98	1.39	2.08	-0.89	2.35	2.36	0.12	2.91	2.78	2.41	2.50	2.09
Austria	3.86	3.79	2.77	0.35	-1.30	1.76	3.34	1.35	1.13	2.97	3.02	2.02	2.09
Denmark	0.58	1.75	1.32	1.00	-0.25	4.98	1.82	2.30	2.57	2.43	2.06	3.50	2.01
Italy	2.92	3.41	4.25	0.05	-1.73	1.40	2.53	2.23	2.12	2.55	1.53	2.62	1.99
Finland	4.43	-1.20	-8.67	-5.53	-1.50	4.48	6.62	2.94	6.78	6.79	2.30	5.52	1.91
Iceland	-0.56	3.51	-2.46	-3.53	-1.13	0.99	1.19	4.81	6.55	8.19	0.89	2.08	1.71
Sweden	3.29	-0.94	-3.34	-3.18	-4.69	7.27	4.09	1.92	2.58	4.39	3.74	4.44	1.63
UK	1.44	-1.36	-1.15	-0.05	3.19	3.07	1.51	3.03	2.92	1.85	2.57	1.89	1.58
Australia	2.11	-2.00	-2.84	1.80	2.36	2.92	-0.01	2.07	3.83	3.37	2.61	1.46	1.47
US	1.56	-0.74	-2.09	1.36	1.03	2.50	1.10	1.64	2.83	3.29	2.72	0.42	1.30
France	1.46	1.56	0.29	0.31	-1.03	1.44	1.38	0.12	1.51	3.25	2.40	2.74	1.29
Hong Kong	3.44	1.16	1.94	5.71	5.36	1.19	-4.23	1.60	1.00	-8.63	0.60	6.03	1.26
Japan	6.66	4.34	2.42	0.52	-0.56	0.11	1.06	2.25	0.20	-2.05	-0.50	0.34	1.23
Canada	0.79	-3.25	-5.46	0.48	0.77	4.44	1.84	0.63	2.03	1.30	3.60	4.65	0.98
Germany	-19.36	5.56	17.91	1.47	-2.57	1.81	1.73	0.07	0.15	2.31	1.77	0.65	0.96
Brazil	-18.47	-6.84	-3.59	-0.45	6.87	12.25	9.97	2.77	3.39	0.33	-1.04	4.57	0.81
Turkey	4.88	8.83	-3.71	-0.28	11.88	-10.88	5.09	3.94	3.53	-0.95	-7.41	-5.29	0.80
New Zealand	-0.29	-3.87	-5.29	1.31	5.55	3.17	0.63	0.84	0.62	-1.42	3.70	2.00	0.58
Switzerland	3.64	1.40	-1.99	-2.52	-1.92	0.60	-0.86	-0.55	0.70	2.18	1.08	2.54	0.36
Hungary	2.66	-5.60	-10.83	-3.92	-1.24	3.79	0.54	-0.15	5.12	3.89	3.09	3.45	0.07

Source: IFS, line 99b; national sources for Taiwan.