

## **CORRUPTION AND CORPORATE FINANCE PATTERNS: AN INTERNATIONAL PERSPECTIVE**

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**Abstract.** This study demonstrates the importance of government corruption in shaping corporate finance patterns across countries. Corruption contributes to a more prevalent and higher degree of corporate equity ownership concentration and more reliance on bank financing in raising external finance. It argues that corporate governance under corrupt governments is particularly poor. Firm management, taking advantage of political capital acquired through bribery, is especially powerful in expropriating from outside investors. Ownership concentration and reliance on bank financing are means of mitigating the corporate governance problem under a corrupt government.

### 1. INTRODUCTION

Corruption occurs when government officials abuse public power for private benefits (Tanzi 1998). Business surveys show that despite the stunning terrorist attacks of 11 September, corruption, not terrorism or security risk issues, constitutes the biggest risk to business operations. Security risks tend to be highly concentrated in certain countries or regions, but corruption is rampant with very severe consequences for corporate profitability (Economist Intelligence Unit 2002).

Recent literature documents one direct effect of corruption on corporate finance – that corruption diminishes the size of both domestic investment and foreign direct investment (Mauro 1995; Wei 2000). This study examines an indirect effect of corruption on corporate finance – that corruption contributes to the prevalence of concentrated corporate ownership structures and greater reliance on bank financing. More concretely, more severe corruption leads to a larger proportion of corporations having controlling block shareholders, a higher average ownership share of large shareholders and banking sector dominance of the equity market in providing external finance for corporations.

We provide one unified theoretical explanation for these empirical findings. Under corrupt governments, corporate managers may take advantage of paying bribes to blur the distinction between the legitimate corporate expenses that include bribery payments for the sake of firm survival and growth and the

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illegitimate expenditure for managers' private benefits. Due to the fear of bribe taking being discovered, corrupt government officials may collude with corporate managers in covering up both bribery and managerial expropriation. Government officials may, for example, weaken the legal rights of outside shareholders in corporate decision-making, and keep lax accounting standards to make corporate information flows opaque. In short, corruption worsens corporate governance. Concentrated corporate ownership and the dominance of bank financing may improve investor protection to some extent and help enlarge the amount of external finance that can be raised. Deposit insurance, particularly implicit deposit insurance, may further enhance the safety of bank deposits, contributing to the dominance of banks in corporations' external financing.

In earlier studies, Demircuc-Kunt and Levine (2001) find some positive correlation between corruption and a bank based financial system, whereas La Porta *et al.* (1998) find a higher incidence of widely-owned corporations in low corruption countries. Our research conducts a systematic empirical analysis that substantially improves on earlier research. First, we provide a conceptual framework to explain why corruption shapes the corporate finance pattern, an issue which was not addressed in the earlier studies. Second, we expand the data set on the prevalence of widely-owned corporations across countries. Furthermore, the earlier studies mainly conducted correlation analysis. We apply instrumental variable regressions and panel data analysis as well as multivariate OLS regression analysis to this issue. This helps us better deal with various issues such as the potential endogeneity problem in econometric analysis. We also analyse the channels through which corruption affects corporate finance patterns. Third, we introduce a new comprehensive corruption index into the analysis of this issue – the corruption index constructed by the World Bank. This makes our analysis more powerful in explaining the impact of corruption on corporate finance patterns.

The rest of the paper is organized as follows. Section 2 presents the conceptual framework linking corruption with corporate finance patterns across countries. Section 3 provides an empirical analysis of how corruption shapes cross-country corporate finance patterns. Section 4 analyses how corruption affects corporate finance patterns through its impact on corporate governance channels. Section 5 concludes the paper.

## 2. CONCEPTUAL FRAMEWORK

Recent research has shown us substantial variation in the relative importance of banks and equity markets for corporate financing and corporate ownership concentration across countries (La Porta *et al.* 1998, 1999a; Allen and Gale 2000). The cross-national difference in the severity of corruption could help explain this diversity in corporate finance patterns.

Under corrupt governments, bribing government officials becomes a primary precondition for the survival and growth of a firm (Fisman 2001; Johnson and Mitton 2003). To minimize transactions costs, it is optimal to delegate the task of bribing to the firm's management, which runs the company on a day to

day basis. Through frequent interaction with government officials, firm managers acquire the political capital that is vital to the firm's success. However, this adds to their capability in expropriating from outside investors at the same time. For example, firm managers can expand business expenditure for their own personal gains by reducing payouts to outside investors. To conceal their expropriation, firm managers can collude with government officials to blur the distinction between 'legitimate' business expenditure, including paying bribes for the firm's sake, and 'illegitimate' expenditure for their own empire building.

Uncovering managerial expropriation requires intensive monitoring and in-depth investigation and involves the risk of exposing government officials' bribe taking activity to the public. In order to avoid their illegal bribe taking being uncovered, government officials may collude with firm managers to deter outside investors and auditors from exercising corporate governance mechanisms. For instance, government officials do not enact and enforce laws and rules that are designed to protect outside minority shareholders; and they will not impose stringent corporate accounting standards and corporate information disclosure codes.

Under these circumstances, concentrated ownership and reliance on bank financing can be regarded as institutional solutions to the corporate governance problems under corrupt governments.

Concentrated equity ownership can overcome the free rider problem in corporate monitoring because block shareholders enjoy a large share of the benefits from the strengthening of corporate governance (Burkart *et al.* 2003). As large shareholders usually participate and even control corporate management (La Porta *et al.* 1999a), they often get involved in bribing government officials to acquire political capital; they can easily distinguish between 'legitimate' and 'illegitimate' corporate expenditure; and they can prevent managerial expropriation without exposing government officials' bribe taking to the public. Because large shareholders have also acquired political capital, there is no advantage to firm managers asking government officials to deter corporate monitoring by block shareholders. This would dramatically diminish the firm management's power in expropriating from outside investors and would enhance economic efficiency.

Concentrated shareholding, however, can have a negative side. When their shareholding reaches some critical level, large shareholders tend to expropriate from small shareholders for their own corporate control benefits (Morck *et al.* 1988). Block shareholders may conduct tunnelling to siphon corporate financial resources out of the firm to increase their own wealth or private benefits through means such as self-dealing (Johnson *et al.* 2000). Clearly, this harms small shareholders' interests, which in turn restricts the size of external equity finance. However, as large shareholders own substantial interests in the corporation, expropriation from shareholders may also reduce firm value and harm to some extent large shareholders' own interests in the corporation. Thus the expropriation by block shareholders may not be as severe as that by managers in widely-owned corporations. We therefore expect concentrated ownership to be more prevalent under more corrupt governments.

As argued earlier, capital market regulation and investor protection are expected to be more deficient under more corrupt governments. Small investors will make less investment in the form of equity into corporations and there are fewer minority shareholders in corporations in more corrupt countries. As a result, the ownership proportion of block shareholders will typically be larger. This higher degree of ownership concentration may reflect the lower participation rate of minority shareholders in the equity market.

Raising external funds through the banking system may potentially be a more effective way to constrain management expropriation. Banks also need to bribe government officials to obtain access to government protection in banking operations. Thus bankers will work with a firm's management to bribe government officials. Having acquired political capital, bankers can conduct corporate monitoring in a similar manner to large shareholders. However, bank financing has its unique strength in disciplining bankers so that they have less opportunity to expropriate from small outside investors than large shareholders do.

First, expropriation from deposit investors is much easier to detect than that of equity investors. Deposits have a fixed claim where the obligation of the bank to depositors is contractually pre-specified and independent of any variation in the firm's cash flow or asset value. If a banker reduces promised repayments to depositors, it is easy to detect and verify that this is a breach of contract. In contrast, equity investors, particularly small stock investors, are not promised or guaranteed any return for their investment. Corporate management or block shareholders may easily misuse corporate earnings and lower the equity return and justify their action through excuses such as the unexpected negative corporate earnings.

Second, the market discipline mechanism may further constrain banker expropriation. Banks have a fragile financial structure as they take demand deposits and make longer-term loans. This maturity mismatch can be employed to constrain the bankers' expropriation from outside depositors (Diamond and Rajan 2000). If the bankers start expropriation by reducing the promised repayment to depositors, a bank run will occur. Under the first come first served sequential service arrangement, it is rational for each individual depositor to withdraw his deposits ahead of the others. This gives rise to a credible threat of bank disintermediation should bank managers expropriate from outside depositors. As a result, a depositor faces a smaller expropriation risk, and it is better to be a small depositor than a small shareholder under a corrupt government; this situation in turn helps to create more liquidity and raise a larger amount of external bank finance than external equity finance.

Third, deposit insurance further enhances the safety of deposit investment and its attractiveness to small investors. In practice, the market discipline mechanism against bankers' expropriation may not be brought into full play due to explicit and implicit government guarantees for the banking sector. Explicit deposit insurance typically requires a government to have substantial fiscal resources and strong prudential regulation of banks. It therefore more often exists in more developed countries (Li 2003). Moreover, it usually contains limited coverage for depositors (Kane & Demircug-Kunt 2001). Implicit

deposit insurance thus plays an important role in most countries. As indicated by Krugman (1998) and Kang (2003), depositors in many countries take government guarantees for bank safety for granted.

Under corrupt governments, the implicit government guarantee may play an even larger role. Because an implicit guarantee is not institutionalized, it offers much room for manipulation by corrupt government officials and bank and corporate managers. With their political capital, bankers can lobby for government protection over deposits which gives them an element of safety. As this implicit guarantee is offered in the name of protecting small depositors' interests, it sounds totally legitimate and can be a safe way for the graft taking government officials to return the favour to bribe making bankers and managers.

As a consequence of this government insurance, small investors will find it even safer to put their money into banks rather than into corporations through capital markets. This further biases corporate finance toward bank credit instead of equity issuance which, at the aggregate level, leads to a bank oriented financial system.

### 3. EMPIRICAL ANALYSIS

#### 3.1. *Hypotheses*

Our theoretical argument leads to the following predictions.

**HYPOTHESIS 1.** *More corrupt governments contribute to the prevalence of corporations with concentrated ownership rather than widely-owned companies.*

**HYPOTHESIS 2.** *The ownership share of large shareholders in companies is on average larger under more corrupt governments.*

**HYPOTHESIS 3.** *In countries with more corrupt governments, bank credit is more likely to be the dominant source for external corporate finance, leading to bank oriented financial systems.*

We further argue that corruption shapes the corporate finance pattern mainly through its negative impact on corporate governance.

#### 3.2. *Measuring corruption*

A complete description of the data used in this study is in the appendix. However, here we note how we measure the degree of government corruption. The standard way of measuring corruption across countries in the literature is to rely on corruption indices. These are survey based subjective indices rather than objective and quantitative measures of actual corruption. In this study, we adopt the index of control of corruption constructed by the World Bank to measure the degree of corruption across countries. This measures the exercise of public power for private gain, including both petty and grand corruption

and state capture. The World Bank corruption index relies on a large number of individual data sources consisting of surveys of firms and individuals as well as the assessments of commercial risk rating agencies, non-governmental organizations and a number of multilateral aid agencies. The aggregate control of corruption index is constructed by applying an unobserved components model. This aggregation approach allows the aggregate corruption index to be more informative about unobserved governance than any individual data source (Kaufmann *et al.* 2005). We choose the World Bank corruption index because, as far as we know, it is the most comprehensive and most carefully constructed corruption index that combines various data sources and applies some statistical methods in aggregating the data sources. A higher score in this corruption index indicates less severe corruption, and the index value ranges from  $-1.11$  to  $2.41$ . Table 1 gives a summary of the major variables used in this research.

### 3.3. Benchmark regressions<sup>1</sup>

#### 3.3.1. Corruption and the prevalence of widely-owned companies

La Porta *et al.* (1999a) construct a cross-country data set on the prevalence of widely-owned corporations (the proportion of widely-owned corporations among large corporations) for the world's 27 richest countries. We extend this data construction to 40 countries around the world that include both developed and emerging economies. A firm is said to have a controlling shareholder if the sum of a shareholder's direct and indirect voting rights exceeds 20%.<sup>2</sup> Widely-owned companies are those companies without a controlling shareholder.

The first regression in Table 2 examines how corruption affects the proportion of widely-owned large corporations around the world. We see that a lower degree of corruption is statistically significantly associated with a larger proportion of widely-owned corporations. In the regression, we control for the logarithm of population and the logarithm of GDP per capita. We control for the logarithm of population as a measure of country size on the basis that larger countries may have larger firms, which might have a lower ownership concentration. Our results remain qualitatively equivalent when we replace population with GDP. Population has a lower correlation with GDP per capita than GDP does; this helps us mitigate the concern for the potential multicollinearity problem. We control for the logarithm of GDP per capita on the grounds that richer countries might have different ownership patterns than poorer ones. The regression demonstrates that larger and richer economies have more prevalent widely-owned corporations.

In unreported regressions, we also control for the Gini coefficient because countries with unequal income and wealth distribution tend to produce a small

<sup>1</sup> Because different dependent variables and independent variables have different number of observations available, there is a variation in the sample size for different regression specifications.

<sup>2</sup> We also adopt an alternative criterion – a 10% ownership share – in defining a large shareholder. The results are qualitatively equivalent.

Table 1. Data summary: statistics

	Number of observations	Mean	SD	Minimum	Maximum
Corruption index	86	0.48	1.05	-1.11	2.41
Proportion of widely-owned companies (20% cut off)	40	0.28	0.27	0	1.00
Mean ownership share of the largest shareholders	48	0.48	0.13	0.18	0.78
Stock market capitalization/deposit money bank assets	85	0.64	0.67	0.0043	3.81
Stock market value traded/domestic bank credit	86	0.27	0.34	0.00025	1.69
Aggregate financial structure index	67	0.011	0.37	-0.26	2.58
Dividend tax disadvantage	48	0.19	0.31	-1.47	0.54
Capital gain tax disadvantage	48	0.036	0.33	-0.74	0.62
Explicit deposit insurance dummy	61	0.21	0.41	0	1
Antidirector rights index	48	3.02	1.31	0	5
Antidirector rights index – creditor rights index	46	0.80	1.77	-2	4
Accounting standards index	40	60.95	13.57	24	83

*Pairwise correlation of selected variables*

	Corruption index	Widely-owned company	Mean large share-holding	Stock cap/bank assets	Stock value traded/bank credit	Aggregate financial structure index	Antidirector rights index	Antidirector rights index – creditor rights index
Widely-owned companies	0.53							
Mean large shareholding	-0.45	-0.77						
Stock capitalization/bank assets	0.22	0.13	-0.25					
Stock value traded/bank credit	0.41	0.17	-0.47	0.64				
Aggregate financial structure index	0.25	0.20	-0.36	0.61	0.24			
Antidirector rights index	0.21	0.32	-0.39	0.43	0.22	0.39		
Antidirector rights index – creditor rights index	0.24	0.31	-0.30	0.36	0.33	0.23	0.63	
Accounting standard index	0.58	0.52	-0.58	0.48	0.54	0.53	0.35	0.12

Table 2. Corruption and corporate finance patterns

	Corruption index	Log of population	Log of GDP p.c.	Dividend tax disadvantage	Capital gains tax disadvantage	Explicit deposit Insurance	No. of Observations	Adjusted $R^2$
Prevalence of widely-owned corporations	0.17* (0.054)	0.12* (0.027)	0.073*** (0.043)				40	0.53
Ownership concentration	-0.094* (0.027)	-0.050* (0.013)	0.014 (0.022)				48	0.40
Log (market cap/bank assets)	0.38*** (0.22)	0.091 (0.073)	-0.096 (0.15)				85	0.036
Log (market cap/bank assets)	0.39*** (0.23)	0.22 (0.14)	-0.23 (0.14)	-0.24 (0.37)	-0.25 (0.44)	-0.50 (0.28)	44	0.018
Log (market value traded/domestic bank credit)	0.59** (0.24)	0.52* (0.080)	0.20 (0.16)				86	0.38
Log (market value traded/domestic bank credit)	0.39*** (0.23)	0.22 (0.14)	-0.23 (0.14)	-0.24 (0.37)	-0.25 (0.44)	-0.50 (0.28)	44	0.018
Financial structure Index	0.052 (0.043)	-0.040 (0.051)	0.019 (0.044)				67	0.047
Financial structure Index	0.12* (0.034)	0.054* (0.019)	-0.032 (0.030)	-0.12 (0.070)	-0.079 (0.077)	-0.17* (0.051)	44	0.13

\*, \*\*, and \*\*\* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The OLS regression estimated is  $Y = \alpha + \beta_1 \text{Corruption Index} + \beta_2 X + \epsilon$ , where  $Y$ , the dependent variable, as shown in the first column, is the proportion of widely-owned large companies, ownership concentration (the mean proportion of shares owned by large shareholders), the logarithm of market capitalization/bank assets, the logarithm of market value traded/domestic bank credit and the aggregate financial structure index respectively.  $X$  is a set of control variables and  $\alpha$  is a constant term. The independent variables are shown in the first row. The major independent variable is the corruption index constructed by the World Bank. Control variables include the logarithm of population, the logarithm of GDP per capita, the dividend tax disadvantage, the capital gains tax disadvantage, and the explicit deposit insurance dummy. Robust standard errors are in parentheses. See the data appendix for detailed variable definitions and sources.



group of ultra-rich people who may have acquired block shares, while the majority of investors are small ones who are short of the cash needed to purchase a significant number of shares. As a result, a higher inequality in income and wealth distribution may lead to a more prevalent concentrated corporate ownership structure. However, our analysis does not detect any strong and clear connection between the Gini coefficient and the proportion of widely-owned companies.

It is worth noting that the impact of corruption on the prevalence of widely-owned companies is not only statistically but also economically significant. A one-point increase in the corruption index will raise the proportion of widely-owned companies by 17%. For example, if Mexico dramatically cleaned up its government so that its corruption index increased from its present level of  $-0.365$  to the US level of  $1.83$ , the proportion of widely-owned companies in Mexico would surge from its current ratio of zero to 37.3%.

### 3.3.2. *Corruption and the degree of ownership concentration*

The second regression in Table 2 confirms a strong positive relationship between the mean ownership share of the top three largest shareholders and the severity of corruption. The impact of corruption is again economically significant. A unit increment in the corruption index (a decrease in the degree of corruption) would reduce the mean proportion of shareholding of the top three largest shareholders by 9.4%.

There is also some strong evidence that large shareholders own a smaller mean proportion of stocks in larger countries. However, the richness of a country does not affect the mean ownership share of large shareholders. In unreported regressions, we do not detect a strong impact of inequality in income distribution on ownership concentration. Again in unreported regression analysis, we also examine the impact of corruption on the median ownership share of the top three largest shareholders. The results are qualitatively equivalent to those with the mean ownership share.

### 3.3.3. *Corruption and bank oriented vs. market oriented financial systems*

Our theoretical argument points out the pronounced impact of corruption on the relative importance of equity markets and banks in financing corporations, that is, the financial system orientation. We use three alternative measures of bank oriented versus market oriented financial systems. The first two measures we use are based on the ratio of the size of the market system over that of the banking system. We first use the logarithm of the ratio of stock market capitalization of listed companies over deposit money bank assets (the average in 1990–1997); that is, the relative size of stock markets versus banks in terms of the value of asset stock. We then use the logarithm of the ratio of stock market value traded over domestic bank credit (the average in 1990–1997) to measure the relative importance of capital markets and commercial banks in corporate finance. This measure represents the ratio of two financial activity variables. The higher these two ratios are, the more market oriented is the financial system. The last measure of financial system orientation is an aggregate

financial structure index constructed by Levine (2002). A higher value of this index indicates a more market oriented financial system.

In the remaining regressions in Table 2, we conduct OLS regressions with different specifications to examine the relationship between the degree of corruption in a country and the three measures of financial system orientation. We control for logarithm of population and logarithm of GDP per capita on the grounds that financial system orientation may be affected by the size of the country and the economic development level. It has often been argued in the literature that developing countries tend to have bank oriented financial systems. We try to see if the impact of corruption on financial system orientation only reflects the level of economic development. Standard corporate finance theory indicates that debt has a tax advantage over equity. We thus control for the two variables that measure the dividend tax disadvantage and capital gains tax disadvantage in different countries.

As we notice in the theoretical argument, explicit deposit insurance may enhance the safety of bank deposits and the size of deposit investments. We thus include a dummy variable in our regressions indicating if an explicit deposit insurance scheme existed in a country in 1980, a year before the period over which the data for our financial system orientation measures are drawn. We expect that an explicit deposit insurance scheme promotes a bank based financial system since it enhances the safety of bank deposits.

The regression results show quite consistently and statistically significantly that countries with less severe corruption tend to have a more market oriented financial system. Moreover, larger countries are more likely to have a more market oriented financial system. The logarithm of GDP per capita does not produce any significant effect. We thus conclude that the impact of corruption on financial system orientation goes well beyond the effect of the level of economic development. The dividend tax disadvantage and capital gains tax disadvantage tend to promote a more bank oriented financial system, but their effects are not statistically significant. There is strong evidence to suggest that explicit deposit insurance promotes a bank based financial system.

The effect of corruption on financial system orientation is economically significant. According to the estimated coefficient on the corruption index in the fourth regression in Table 2 (0.39), a one standard deviation increase in the corruption index (1.05) would increase the logarithm of the ratio of market capitalization to deposit money bank assets by 0.41, where the mean and standard deviation of the log ratio are  $-0.95$  and  $1.15$ , respectively. Moreover, the estimates can explain why countries such as Bolivia and China with severe government corruption (corruption index values of  $-0.64$  and  $-0.075$  respectively) have more bank oriented financial systems (log ratios of  $-3.34$  and  $-2.37$  respectively) than Sweden (log ratio of  $0.28$ ), which has a corruption index of  $2.37$ .

### 3.4. *IV regressions*

One potential concern with our OLS regressions is the possible endogeneity of the corruption index. For instance, some countries may exhibit ownership

concentration and a bank oriented financial system for reasons unrelated to corruption. However, the prevalence of block shareholders and large bankers may aggravate government corruption; they may initiate bribery to seek favourable treatment from government officials. Moreover, observation of centralized financing modes such as corporations controlled by large shareholders and the dominance of bank financing may induce people to have a perception of a high degree of corruption stemming from their close connection with government officials; this could be a problem as our corruption index is a survey based subjective measure.

To address this concern, we adopt an instrumental variable approach. First, starting from the cultural theory of institutional development, we choose religious composition, that is, the proportions of the population that follow the Protestant, Roman Catholic and Muslim religions in each country, as our instrumental variables. The cultural theory of institutions states that different societies developed different cultures, including different work ethics, tolerance, trust and other characteristics of a society, that help shape different government and legal institutions. Religions play an important role in shaping the culture and thus government quality (see La Porta *et al.* 1999b). As corruption is one central feature of government quality or government efficiency, religions are expected to cast a profound impact on the degree of corruption. Similarly, Putnam (1993), Landes (1998) and Inglehart (2000) also argue that the Roman Catholic and Muslim religions tend to generate hierarchical bonds of authority and centralized organization in churches, while Protestant churches are more decentralized. Hierarchical churches led to less horizontal interpersonal trust, which might generate state intervention and facilitate government corruption. We thus make use of religious composition as instrumental variables for the corruption index.

To see whether the instrumental variables are strongly correlated with the corruption index, we present in Column 2 of Panel 1 in Table 3 the regression of the corruption index on religious composition variables. This is also the benchmark case of first stage regression with other exogenous variables excluded. We find statistically significant evidence that countries with a larger proportion of Protestant followers typically have a lower degree of corruption, while countries with a larger Muslim population tend to have more severe corruption.

The two stage least squares (TSLS) regressions using religious composition as instrumental variables are shown in Panel 2 of Table 3. For both ownership concentration and financial system orientation, the TSLS regressions basically confirm the results derived from the OLS regressions: widely-owned corporations, a lower degree of ownership concentration and a market oriented financial system are more likely to prevail in less corrupt countries.

We present the adjusted  $R^2$  and the  $P$ -value of  $F$ -test for the first stage regressions with both instrumental variables and other exogenous variables included. These numbers show that the instrumental variables we choose are strong ones. The results of the over-identifying restrictions tests indicate that the instrumental variables are valid. In other words, we conclude that the

Table 3. Corruption and corporate finance patterns: IV regressions

Panel 1 First stage regressions (dependent variable: corruption index)										
Proportion of Protestants	0.019*									
	(0.0036)									
Proportion of Roman Catholics	0.00075									
	(0.0032)									
Proportion of Muslims	−0.0058**									
	(0.0026)									
Log of settler mortality								−0.62*		
								(0.14)		
Constant term	0.26							2.70*		
	(0.20)							(0.59)		
Number of observations	82							38		
Adjusted $R^2$	0.23							0.46		
Panel 2 Instrumental variables: religious composition										
	Corruption index	Log of population	Log of GDP p.c.	Dividend tax disadvantage	Capital gains tax disadvantage	Explicit deposit insurance	No. of observations	1st stage Adj. $R^2$ ( $F$ -test $P$ -value.)	OIR test $P$ -value.	Hausman test $P$ -value
Prevalence of widely-owned corporations	0.19*** (0.11)	0.13* (0.035)	0.059 (0.067)				40	0.69 (0.00)	0.39	0.81
Ownership concentration	−0.18* (0.055)	−0.060* (0.019)	0.073*** (0.037)				48	0.69 (0.00)	0.98	0.76
Log(market cap/bank assets)	0.78*** (0.48)	0.094 (0.085)	−0.33 (0.33)				84	0.71 (0.00)	0.70	0.76
Log(market cap/bank assets)	0.59 (0.47)	0.25*** (0.17)	−0.35 (0.28)	−0.33 (0.40)	−0.23 (0.44)	−0.56*** (0.33)	44	0.80 (0.00)	0.24	0.60
Log(market value traded/ domestic bank credit)	1.18*** (0.62)	0.53* (0.087)	−0.16 (0.38)				85	0.69 (0.00)	0.34	0.47
Log(market value traded/ domestic bank credit)	0.99*** (0.56)	0.64** (0.25)	−0.12 (0.33)	−0.92 (0.69)	−0.17 (0.48)	−0.71 (0.44)	44	0.77 (0.00)	0.93	0.48
Financial structure index	−0.044 (0.22)	−0.043 (0.058)	0.079 (0.17)				67	0.69 (0.00)	0.61	0.52
Financial structure index	0.15*** (0.087)	0.068** (0.029)	−0.047 (0.054)	−0.14*** (0.075)	−0.076 (0.077)	−0.18** (0.067)	44	0.77 (0.00)	0.49	0.62

Panel 3 Instrumental variable: settler mortality

	Corruption index	Log of population	Log of GDP p.c.	Dividend tax disadvantage	Capital gains Tax disadvantage	Explicit deposit insurance	# of obs	1st stage Adj. $R^2$ ( $F$ -test $P$ -val.)	Hausman test $P$ -value
Log(market cap/bank assets)	0.37 (0.22)						38	0.38 (0.00)	0.55
Log(market cap/bank assets)	0.71 (0.61)	0.39 (0.33)	-0.15 (0.36)	-0.65 (0.61)	-0.30 (0.78)	-0.93 (0.83)	22	0.73 (0.00)	0.40
Log(market value traded/ domestic bank credit)	1.42* (0.34)						39	0.38 (0.00)	0.031
Log(market value traded/ domestic bank credit)	1.58*** (0.92)	1.01** (0.47)	-0.041 (0.46)	-1.64*** (0.90)	0.97 (0.95)	-1.82 (1.53)	22	0.73 (0.00)	0.16
Financial structure index	0.12*** (0.069)						37	0.38 (0.00)	0.65
Financial structure index	0.29*** (0.16)	0.095 (0.063)	-0.066 (0.083)	-0.28*** (0.14)	0.15 (0.14)	-0.34 (0.25)	22	0.73 (0.00)	0.096

\*, \*\*, and \*\*\* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The regression estimated in Panels 2 and 3 is  $Y = \alpha + \beta_1 \text{Corruption Index} + \beta_2 X + \varepsilon$ , where  $Y$ , the dependent variable, as shown in the first column, includes the proportion of widely-owned large companies, ownership concentration (the mean ownership share of large shareholders), the logarithm of the ratio of stock market capitalization of listed companies to deposit money bank assets, the logarithm of the ratio of stock market value traded to domestic bank credit and the aggregate financial structure index.  $X$  is a set of control variables and  $\alpha$  is a constant term. The regressions are estimated by two stage least squares method. The endogenous independent variable is the corruption index constructed by the World Bank. In Panel 2, we choose religious compositions, that is, the proportion of population that is Protestant, Roman Catholic and Muslim as instrumental variables. In Panel 3, we choose the logarithm of settler mortality as our instrumental variable. Settler mortality is the annualized deaths per thousand European soldiers in European colonies in the early nineteenth century. Panel 1 displays the first stage regressions of the corruption index on religious composition and settler mortality respectively. Exogenous control variables include the logarithm of population, the logarithm of GDP per capita, the dividend tax disadvantage, the capital gain tax disadvantage and the explicit deposit insurance dummy. Robust standard errors are in the parentheses. See the data appendix for detailed variable definitions and sources.

religious composition variables affect the corporate ownership structure and financial system orientation only through their effects on government institutions, that is, the corruption index. The religious composition variables do not have a direct impact on the dependent variable. The Hausman tests show that in all cases there is no significant difference between the results of the OLS regressions and those of the IV regressions.

Second, we employ settler mortality as an alternative instrumental variable for corruption. Endowment theory provides an explanation for institutional development in former European colonies from the perspective of geography and the colony's susceptibility to disease. As different colonies were endowed with different environmental conditions, Europeans adopted different types of colonization strategy. Settler colonies and extractive colonies are two benchmark cases. Settler colonies have favourable endowments with moderate weather and few epidemics, enabling Europeans to settle in large numbers and set up institutions to protect private property rights and constrain executive power. In contrast, extractive colonies were typically based in inhospitable environments that posed a serious threat to Europeans' health and settlement prospects. As a consequence, Europeans did not intend to stay permanently and so did not build up good institutions; instead they attempted to extract as many resources as they could as quickly as possible. The institutions created by European colonizers persisted after the colonial era. Post-independent regimes tend to resemble pre-independent regimes. Settler colonies tend to have strong institutions, producing post-colonial governments that are more accountable and democratic, while extractive colonies typically inherited extractive institutions where the post-colonial elite frequently assumed power and exploited the pre-existing extractive institutions (Acemoglu *et al.* 2001). Since corruption is one central aspect of government efficiency, we expect that settler colonies have on average a lower degree of corruption than extractive colonies do.

Endowment theory constructed settler mortality to serve as the primary measure of environmental conditions and thus the institutional quality for former colonies. Settler mortality is an overall measure of annualized deaths per thousand European soldiers in the early nineteenth century with each death replaced with a new soldier. To diminish the impact of outliers, we use the logarithm of settler mortality. The data on the log of settler mortality show enormous variation, ranging from 2.15 (New Zealand) to 7.99 (Mali). A higher settler death rate indicates a more inhospitable geographical environment and greater susceptibility to disease for colonial settlers; this led to an extractive colonization strategy and weak institutions in the post-colonial era.

To see whether settler mortality is strongly correlated with the corruption index, we present in Column 3 of Panel 1 in Table 3 the regression of the corruption index on the logarithm of settler mortality among former European colonies within our sample. It is clear that a higher level of settler mortality leads to more severe government corruption and the effect is significant at the 1% level. Acemoglu *et al.* (2001) have shown convincingly that settler mortality is a valid instrumental variable for institutional strength. This first stage regression confirms to us that settler mortality is truly a strong instrumental variable.

Utilizing settler mortality as an instrumental variable, however, has its own limitations. It only applies to former European colonies rather than the world sample. As too few former European colonies have data on corporate ownership structure to warrant a regression analysis, we focus on financial system orientation in our TSLS regressions using settler mortality as an instrumental variable. Because of the lack of data in many of the former colonies on some of our control variables, we present two types of regression specifications in Panel 3 of Table 3. First, we let the corruption index be the lone independent variable to see how corruption affects financial system orientation. Second, we introduce various control variables to test the robustness of our results. It is clear that less corrupt countries do tend to have a more market oriented financial system in most of the regressions.

The adjusted  $R^2$  and the  $p$ -value of  $F$ -test for the first stage regressions with both instrumental variable and other exogenous variables included show that settler mortality is a strong instrumental variable. The Hausman tests indicate that in some cases there are significant differences in results between the OLS regressions and the TSLS regressions.

### 3.5. *Panel data analysis*

In addition to the cross-section regressions based on the period 1990–1997, we also conduct panel data analysis on financial system orientation.<sup>3</sup>

The financial system orientation measured as the ratio of stock market capitalization to deposit money bank assets can be traced back to 1976 for our sample. However, the World Bank corruption index starts compilation as late as 1996. This index is certainly not suitable for our panel data analysis spanning several decades. As far as we know, the corruption index constructed by the International Country Risk Guide (ICRG) has the longest history of continuous compilation with data available going back to 1985. We thus adopt the ICRG corruption index in our panel data analysis.

Because of the stability of financial system structure and the ranking of different countries in the corruption index during a relatively short period of time, we examine the relationship between corruption and financial system orientation for every five year period starting with 1985. In other words, we treat every five years as a period and divide the sample of the dependent variable into three periods: 1986–1990, 1991–1995 and 1996–1997.<sup>4</sup> We take the mean value of the dependent variable over these three periods. We then use the ICRG corruption index for 1985, 1990 and 1995 to match these three periods.

The explanatory variables that we examine can be classified into two types. Population size and GDP per capita have time variation, whereas the dividend

<sup>3</sup> There is no time variation in the currently available data on the proportion of widely-owned corporations among large companies and the mean or median proportion of shareholding of the top three largest shareholders in large companies. So we cannot conduct panel data analysis.

<sup>4</sup> The sample ends in 1997.

tax disadvantage, capital gain tax disadvantage and explicit deposit insurance dummy variables do not vary with time for our sample countries. To accommodate these two types of variables, we choose both fixed effects and random effects models to conduct the panel data regressions. Furthermore, random effects regressions are essential for another important reason. There is no substantial variation in the relative ranking of different countries in the ICRG corruption index over 1985–1995. The pairwise correlation of the 1985 and 1990 indices is as high as 0.91; that of the 1990 and 1995 indices is 0.77; and even that of the 1985 and 1995 indices amounts to 0.70. Given the limited time variation in the corruption index, it is especially advisable to conduct random effects regressions.

In Table 4, we first present regression results controlling for country fixed effects. We include regressors with time variation such as the corruption index,

*Table 4. Corruption and financial system orientation: panel data analysis*

Estimation method	FE	FE	RE	RE	RE
Corruption index	0.10*** (0.054)	0.093*** (0.053)	0.14* (0.048)	0.12** (0.051)	0.13** (0.063)
Log of population		1.61** (0.70)		0.16** (0.081)	0.23** (0.12)
Log of GDP per capita		0.044 (0.32)		0.12 (0.090)	0.036 (0.11)
Dividend tax disadvantage				−0.12 (0.076)	−0.046 (0.42)
Capital gains tax disadvantage					−0.41 (0.38)
Explicit deposit insurance dummy					−0.49 (0.30)
Number of observations	198	198	198	198	127
Number of countries	78	78	78	78	44
<i>P</i> -value of <i>F</i> -test of all fixed error = 0	0.00	0.00			
<i>P</i> -value of Breusch and Pagan Lagrangian multiplier test			0.00	0.00	0.00
<i>R</i> <sup>2</sup>	0.52	0.57	0.51	0.55	0.51

\*, \*\* and \*\*\* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The regression estimated is  $Y = \alpha + \beta_1 \text{Corruption Index} + \beta_2 X + \varepsilon$ , where  $Y$ , the dependent variable, is the logarithm of the ratio of stock market capitalization of listed companies to deposit money bank assets,  $X$  is a set of control variables and  $\varepsilon$  is the error term. A higher value of the dependent variable  $Y$  suggests a more market oriented financial system. The independent variables are shown in the first column. The major independent variable is the corruption index constructed by the International Country Risk Guide (ICRG). The control variables include the logarithm of population, the logarithm of GDP per capita, the dividend tax disadvantage, the capital gains tax disadvantage and the explicit deposit insurance dummy. In our panel data analysis, we use the mean value of the logarithm of stock market capitalization of listed companies/deposit money bank assets over the periods 1986–1990, 1991–1995 and 1996–1997 as the dependent variable. Correspondingly, we use the 1985, 1990 and 1995 values of the corruption index constructed by ICRG, the logarithm of population and the logarithm of GDP per capita to match these three periods. These variables with time variation are included in the fixed effects (FE) regressions. The random effects (RE) regressions incorporate all variables mentioned. Robust standard errors are in the parentheses. *P*-values for *F*-test of fixed effects and Breusch and Pagan Lagrangian multiplier test for random effects are reported. Period dummies and constant term are included in the regressions but not reported to save space. See the data appendix for detailed variable definition and sources.



the logarithm of population and the logarithm of GDP per capita. Despite its limited time variation, the corruption index still produces quite strong positive effects on market oriented financial systems in the fixed effects regressions. This result further relieves us of our concern for reverse causality. In addition, it also helps mitigate the potential concern that both financial system orientation and corruption are driven by an unspecified exogenous variable.

We next present several specifications for random effects regressions in Table 4. The regression results again show quite strongly and consistently that a lower degree of government corruption contributes to a more market oriented financial system.

### 3.6. *Corruption, financial development and corporate finance pattern*

We argue that corruption restricts the size of equity markets more than that of banks. Could the strong association between corruption and the corporate finance pattern be simply driven by some extremely corrupt countries that are financially underdeveloped?

To address this concern, we examine whether the relationship between corruption and corporate finance patterns remains intact after removing financially underdeveloped countries. By following the methodology of Demirgüç-Kunt and Levine (2001), we classify countries into financially underdeveloped and financially developed ones. A country's financial system is considered to be developed if it has above median values of both bank and market development. Bank and market development are measured by the ratio of domestic bank credit to GDP and the ratio of stock market capitalization to GDP respectively.

In Table 5, we examine the relationship between corruption and corporate finance patterns by focusing on the subsample of financially developed economies. We find that a higher degree of corruption consistently and statistically significantly contributes to the occurrence and the degree of ownership concentration and relative reliance on bank financing, even among financially developed economies. This relieves us of the concern that the results we obtained earlier are primarily driven by some less financially developed countries.

We also focus on the subsample with developed equity markets characterized by an above median ratio of stock market capitalization to GDP. In unreported regressions, we find that our results remain intact, which reconfirms that our results are not primarily driven by a concentration of highly corrupt countries with no actively traded stock markets.

## 4. CORRUPTION, CORPORATE GOVERNANCE AND CORPORATE FINANCE PATTERN

We want to empirically investigate whether corruption casts a shadow on the corporate finance pattern through corporate governance. At the country level, the variation in corporate governance across countries is mainly reflected in areas such as the legal protection of investor rights and corporate information disclosure standards.

Table 5. Corruption and corporate finance patterns: for financially developed economies only

	Corruption index	Log of population	Log of GDP p.c.	Dividend tax disadvantage	Capital gains tax disadvantage	Explicit deposit insurance	No. of observations	Adjusted $R^2$
Prevalence of widely-owned corporations	0.17*** (0.092)	0.13* (0.033)	0.063 (0.059)				31	0.48
Ownership concentration	-0.087*** (0.043)	-0.046* (0.012)	0.0077 (0.031)				35	0.36
Log(market cap/bank assets)	0.35*** (0.20)	-0.029 (0.087)	-0.30** (0.15)				41	0.0060
Log(market cap/bank assets)	0.69* (0.20)	0.16*** (0.088)	-0.52* (0.14)	-0.39 (0.62)	-0.62** (0.28)	-0.44** (0.21)	31	0.18
Log(market value traded/domestic bank credit)	0.61* (0.22)	0.35* (0.078)	-0.15 (0.18)				41	0.32
Log(market value traded/domestic bank credit)	0.74** (0.30)	0.39** (0.15)	-0.25 (0.17)	-1.64** (0.76)	-0.64*** (0.36)	-0.52*** (0.31)	31	0.23
Financial structure index	-0.060 (0.11)	-0.082 (0.081)	0.071 (0.090)				40	0.044
Financial structure index	0.14** (0.057)	0.053** (0.022)	-0.077*** (0.044)	-0.24**** (0.15)	-0.16*** (0.078)	-0.19* (0.057)	31	0.11

\*, \*\*, and \*\*\* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The OLS regression estimated is  $Y = \alpha + \beta_1 \text{Corruption Index} + \beta_2 X + \varepsilon$ , where  $Y$ , the dependent variable, as shown in the first column, includes the proportion of widely-owned large companies, ownership concentration (the mean proportion of shares owned by large shareholders), the logarithm of the ratio of stock market capitalization of listed companies to deposit money bank assets, the logarithm of the ratio of stock market value traded to domestic bank credit and the aggregate financial structure index.  $X$  is a set of control variables,  $\alpha$  a constant term and  $\varepsilon$  the error term. The independent variables are shown in the first row. The major independent variable is the corruption index constructed by the World Bank. Control variables include the logarithm of population, the logarithm of GDP per capita, the dividend tax disadvantage, the capital gains tax disadvantage and the explicit deposit insurance dummy. Regressions are conducted for the subsample of financially developed economies only. A country's financial system is considered to be developed if it has above median values for both bank and market development in the sample. The bank and market development are measured by the ratio of domestic bank credit to GDP and the ratio of stock market capitalization to GDP, respectively. Robust standard errors are in the parentheses. See the data appendix for detailed variable definitions and sources.

#### 4.1. *Corruption, legal codes and corporate finance pattern*

We suggest that, under a corrupt government, in order to deter outside investors from detecting expropriation and to keep bribe taking secret, corporate managers, large shareholders and large bankers may collude with corrupt government officials to weaken legal protections for small investors and slant legal protection toward corporate and bank insiders. For instance, minority shareholder rights are typically weak under corrupt governments, while large bankers, who account for the majority of secured creditors, may ask government officials for more legal protection for secured creditors.

We use the creditor rights index and antidirector rights index constructed by La Porta *et al.* (1998) to measure the legal rights of large bankers (secured creditors) and minority shareholders. The creditor rights index covers issues such as whether or not secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm. The antidirector rights index gauges certain minority shareholder rights such as whether or not shareholders are allowed to mail their proxy votes to the firm. We find that the pairwise correlation between the corruption index and the minority shareholder rights index is 0.21, while that between the corruption index and the creditor rights index is  $-0.17$ . This provides some evidence that a lower degree of corruption is associated with stronger minority shareholder rights and weaker secured creditor rights.

To see whether investor rights are one corporate governance channel through which corruption shapes financial system orientation, we adopt an empirical strategy that is similar to that of Acemoglu *et al.* (2003) – we introduce investor rights indices into our regressions<sup>5</sup> and compare the statistical significance and magnitude of the estimated coefficients from regressions with and without investor rights. If the corruption index loses statistical significance and the investor rights indices are significant, investor protection may be regarded as one primary corporate governance mechanism for corruption to affect corporate finance patterns. If both the corruption index and the investor rights indices are statistically significant, the two variables may both have independent effects on the corporate finance pattern and investor rights can be one significant way through which corruption shapes corporate finance modes. We may further compare the magnitude of estimated coefficients of the corruption index in regressions with and without investor rights indices. If the magnitude of the estimated coefficients decreases substantially, we may conclude that investor rights are still one major channel. Otherwise we can regard investor rights as one mediating channel, but probably not the primary one. Finally, if the corruption index remains statistically significant while the legal codes are not

<sup>5</sup> La Porta *et al.* (1998) also emphasize the importance of legal origins in shaping the cross-country variation in investor protection. Since legal origins are important determinants of the quality of government, including corruption *per se* (La Porta *et al.* 1999b), we avoid putting legal origins into our regressions and focus on the *de jure* rights of investors.

significant, we may conclude that corruption affects the corporate finance pattern through channels other than investor rights.

In terms of ownership concentration, we expect that a higher value in the antidirector rights index is associated with a more dispersed ownership structure because better the legal protection of minority shareholders encourages more active participation from small shareholders, which in turn leads to dispersed shareholding. In Table 6, the first regression shows that both the corruption index and the antidirector rights index are statistically significant in explaining the prevalence of widely-owned companies. The estimated coefficient of the corruption index also diminishes to some extent compared with the corresponding one without the investor rights index in Table 2. This suggests that minority shareholder rights serve as one major channel for corruption to affect dispersed shareholding. The second regression in Table 6 looks at the mean ownership share of block shareholders. Both the corruption index and the antidirector rights index remain statistically significant and the latter is more significant. At the same time, the estimated coefficient of the corruption index diminishes in magnitude compared with the corresponding one without controlling for the antidirector rights index in Table 2. We thus conclude that minority shareholder rights are one major channel that mediates the effects of corruption on corporate ownership concentration.

We then turn to financial system orientation. As shown by the law and finance literature, a higher value on the antidirector rights index leads to a larger equity market because it encourages the participation of small equity investors in stock markets. A higher value of the creditor rights index also leads to greater debt financing, including bank financing. Since the creditor rights index mainly reflects the power of banks in capturing firm assets in the bankruptcy state and small depositors can effectively resist bankers' expropriation to a large extent, we thus expect that a higher creditor rights index would promote bank financing.

As we are studying the relative importance of banks versus equity markets, we use the difference between the antidirector rights index and the creditor rights index to measure the bias of legal protection toward minority shareholders. We expect that a larger difference will mean the financial system slants toward being market based.

The remaining regressions in Table 6 examine the impact of corruption on financial system orientation after controlling for investor protection. Regressions show that stronger legal protection for minority shareholders relative to secured creditors does promote a more market based financial system and this effect is consistently statistically significant, whereas the corruption index loses statistical significance in some regression specifications. We thus conclude that investor rights are one major channel that mediates the effects of corruption.

#### 4.2. *Corruption, accounting standards and corporate finance pattern*

Corrupt government officials may collude with corporate insiders to lower accounting and auditing standards or even to obstruct moves toward improving

Table 6. Corruption, investor right, and corporate finance patterns

	Corruption Index	Anti-director rights index	Antidirector rights-creditor rights	Log of population	Log of GDP p.c.	Dividend tax disadvantage	Capital gains tax disadvantage	Explicit deposit insurance	No. of observations	Adj. $R^2$
Prevalence of widely-owned corporations	0.14** (0.064)	0.050** (0.022)		0.13* (0.027)	0.092*** (0.050)				37	0.58
Ownership concentration	-0.053 (0.029)	-0.026** (0.012)		-0.037* (0.012)	-0.010 (0.022)				47	0.41
Log(market cap/bank assets)	0.21 (0.14)		0.18* (0.049)	-0.061 (0.060)	-0.29 (0.10)				45	0.17
Log(market cap/bank assets)	0.37* (0.13)		0.23* (0.049)	0.14** (0.063)	-0.28* (0.10)	-0.34 (0.25)	-0.31 (0.33)	-0.73* (0.20)	42	0.32
Log(market value traded/ domestic bank credit)	0.27 (0.18)		0.12*** (0.064)	0.17** (0.079)	0.083 (0.16)				45	0.17
Log(market value traded/ domestic bank credit)	0.47** (0.22)		0.16** (0.065)	0.37* (0.11)	0.077 (0.17)	-0.65 (0.57)	-0.14 (0.39)	-0.72** (0.29)	42	0.20
Financial structure index	0.063 (0.042)		0.023*** (0.012)	-0.0070 (0.017)	-0.036 (0.029)				45	0.02
Financial structure index	0.12* (0.037)		0.039* (0.012)	0.052* (0.016)	-0.040 (0.029)	-0.14** (0.055)	-0.098 (0.063)	-0.22* (0.048)	42	0.22

\*, \*\*, and \*\*\* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The regression estimated is  $Y = \alpha + \beta_1 \text{Corruption Index} + \beta_2 \text{Investor Rights Index} + \beta_3 X + \varepsilon$ , where  $Y$ , the dependent variable, as shown in the first column, includes the proportion of widely-owned large companies, ownership concentration (the mean ownership share of large shareholders), the logarithm of the ratio of stock market capitalization of listed companies to deposit money bank assets, the logarithm of the ratio of stock market value traded to domestic bank credit and the aggregate financial structure index. The independent variables are shown on the first row. The major independent variables are the corruption index constructed by the World Bank and the investor rights index. The investor rights index is the antidirector rights index for the prevalence of widely-owned corporations and ownership concentration analysis and the difference between the antidirector rights index and the creditor rights index for financial system orientation analysis respectively.  $X$  is a set of control variables and  $\alpha$  is a constant term. The regressions are estimated by the OLS method. Control variables include the logarithm of population, the logarithm of GDP per capita, the dividend tax disadvantage, the capital gains tax disadvantage and the explicit deposit insurance dummy. Robust standard errors are in the parentheses. See the data appendix for detailed variable definitions and sources.

transparency in corporate information disclosure in order to cover up both bribe taking and managerial expropriation.

To see whether corporate information disclosure serves as a corporate governance channel, we introduce the accounting standards index into our basic regressions. This index measures the accuracy and transparency of corporate accounting information. A higher score in this index indicates that corporations follow higher accounting standards.

In Table 7, we present regression results derived after controlling for the accounting standards index. First, we take a look at the prevalence and degree of ownership concentration. The regressions show that both the corruption index and the accounting standards index remain consistently statistically significant, though the significance of the latter is sometimes higher. The magnitude of the estimated coefficients of the corruption index is also smaller to some extent than those in the corresponding regressions in Table 2 without controlling for the accounting standards index. This suggests that the accounting standards index serves as one major channel mediating the effects of corruption on the corporate ownership pattern.

In terms of financial system orientation, the remaining regressions in Table 7 show that better accounting standards contribute to a more market oriented financial system, whose effect is consistently statistically significant. The corruption index loses statistical significance after the introduction of transparency in corporate information disclosure. This suggests that accounting standards are one primary channel through which corruption shapes the financial system's orientation.

#### 4.3. *Some further robustness tests*

In our regression analysis, reviewing the prevalence of widely-owned companies (the proportion of companies without large controlling shareholders at the 20% criterion) shows a few countries with zero values. Would it cause any bias in estimation? To deal with this potential concern, we re-estimate the equation using a Tobit model. In unreported results, we find that the Tobit estimations yield qualitatively equivalent results to the OLS regressions. This further confirms our earlier results.

In an earlier version of this paper which is available upon request, we use the average of the corruption indices constructed by Transparency International and International Country Risk Guide to measure corruption and obtain qualitatively equivalent results.

It is sometimes suggested that the correlation between corruption and the financial system's orientation may also be related to government interventionism. Often decision making in banks (or block shareholder controlled companies) is more centralized than that in shareholding companies (or widely-owned companies). Bankers usually make decisions on lending policies on behalf of the bank's depositors and block shareholders dominate in corporate decision-making over minority shareholders. An interventionist government finds it easier to guide bankers or block shareholders in the allocation of financial resources

Table 7. Corruption, accounting standard, and corporate finance patterns

	Corruption index	Accounting standards index	Log of population	Log of GDP p.c.	Dividend tax disadvantage	Capital gains tax disadvantage	Explicit deposit insurance	# of obs.	Adj. $R^2$
Prevalence of widely-owned corporations	0.13** (0.058)	0.0069** (0.0028)	0.14* (0.025)	0.073 (0.043)				35	0.64
Ownership concentration	-0.064*** (0.032)	-0.0035* (0.0012)	-0.053* (0.014)	0.0028 (0.024)				40	0.50
Log(market cap/bank assets)	-0.19 (0.21)	0.050* (0.011)	-0.050 (0.091)	-0.26 (0.16)				40	0.41
Log(market cap/bank assets)	-0.15 (0.24)	0.049* (0.011)	0.057 (0.10)	-0.19 (0.16)	0.23 (0.59)	-0.24 (0.33)	-0.40*** (0.21)	39	0.41
Log(market value traded/domestic bank credit)	-0.11 (0.21)	0.052** (0.020)	0.17 (0.14)	0.076 (0.24)				40	0.26
Log(market value traded/domestic bank credit)	0.065 (0.31)	0.041*** (0.023)	0.34*** (0.20)	0.096 (0.24)	-1.23 (1.13)	-0.18 (0.52)	-0.55*** (0.31)	39	0.25
Financial structure index	-0.0088 (0.037)	0.010* (0.0026)	-0.012 (0.022)	-0.044 (0.034)				40	0.31
Financial structure index	0.018 (0.039)	0.0091* (0.0028)	0.027 (0.022)	-0.025 (0.034)	-0.067 (0.12)	-0.083 (0.056)	-0.16* (0.043)	39	0.38

\*, \*\*, and \*\*\* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The regression estimated is  $Y = \alpha + \beta_1 \text{Corruption Index} + \beta_2 \text{Accounting Standards Index} + \beta_3 X + \varepsilon$ , where  $Y$ , the dependent variable, shown in the first column, includes the proportion of widely-owned large companies, ownership concentration (the mean ownership share of large shareholders), the logarithm of the ratio of stock market capitalization of listed companies to deposit money bank assets, the logarithm of the ratio of stock market value traded to domestic bank credit and the aggregate financial structure index. Independent variables are shown on the first row. The major independent variables are the corruption index constructed by the World Bank and the accounting standards index. A higher value of the accounting standards index indicates a more transparent corporate accounting system.  $X$  is a set of control variables and  $\alpha$  is a constant term. The regressions are estimated by OLS method. Control variables include the logarithm of population, the logarithm of GDP per capita, the dividend tax disadvantage, the capital gains tax disadvantage and the explicit deposit insurance dummy. Robust standard errors are in the parentheses. See the data appendix for detailed variable definitions and sources.

than to deal with widely-owned companies where minority shareholders may sell off their shareholdings when they disagree with the business strategy adopted. Hence government intervention may promote bank financing and concentrated ownership. As corrupt governments usually impose overregulation on the economy, we try to see whether corruption casts an independent shadow on the corporate finance pattern. We construct a government intervention index that synthesizes three indices produced by the Economic Freedom of the World. These indices reflect government intervention in aspects such as government subsidy and transfer, government enterprises and the top marginal tax rate. In unreported results, we include this index into our various regressions and find that the corruption index remains statistically significant and the results described in this study remain qualitatively equivalent.

## 5. CONCLUSION

This study points out the importance of corruption in shaping corporate finance patterns across countries. We argue that corruption worsens corporate governance because firm managers and corrupt government officials collude to weaken financial regulations to facilitate bribery and managerial expropriation. Minority equity investors are particularly vulnerable to expropriation by corporate managers and block shareholders. Many cross-country variations in corporate finance patterns are institutional responses to the corporate governance issues under government corruption.

Though concentrated ownership may improve corporate governance to some extent, large shareholders may also expropriate from minority shareholders. The fixed claim nature of deposit investment, the bank run threat stemming from the sequential service arrangement for bank deposits and deposit guarantees enhance the safety of bank deposits against the expropriation by bankers and corporate insiders. We thus observe more prevalent ownership concentration and bank oriented financial systems in countries with more corrupt governments.

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## APPENDIX

Proportion of widely-owned corporations: percentage of large firms that are widely held, using the 20% definition of control, from La Porta *et al.* (1999a), complemented by own collection from Worldscope data set.

Mean proportion of shares owned by large shareholders: the average percentage of common shares owned by the three largest shareholders in the 10 largest non-financial, privately owned domestic firms in a given country. The data are from La Porta *et al.* (1998).

Corruption index: the 'Control of Corruption' governance index constructed by the World Bank. We use the average of the index value for 1996 and 1998. The data are available from [www.worldbank.org/wbi/governance/govdata/](http://www.worldbank.org/wbi/governance/govdata/).

Stock market capitalization/deposit money bank assets: this is computed as the ratio of (stock market capitalization of listed companies/GDP) over (deposit money bank assets/GDP), averaged in the period 1988–1997. Data on the stock market capitalization of listed companies/GDP are from World Development Indicator CD-ROM, while data on deposit money bank assets/GDP are from the World Bank Financial Structure database website at [www.worldbank.org/research/projects/finstructure](http://www.worldbank.org/research/projects/finstructure).

Stock market trading value/domestic bank credit: this is computed as the ratio of (stock market value traded/GDP) over (domestic credit provided by

banking sector/GDP), averaged over the period 1988–1997, from World Development Indicator CD-ROM.

Aggregate financial structure index: constructed as the average of the deviations from the mean for the inverse of relative bank size, relative bank activity and relative bank efficiency. Higher values indicate a more market-based financial system. Data are available from World Bank Financial Structure database website at [www.worldbank.org/research/projects/finstructure](http://www.worldbank.org/research/projects/finstructure).

Dividend tax disadvantage: tax disadvantage on dividends, available from World Bank Financial Structure database website at [www.worldbank.org/research/projects/finstructure](http://www.worldbank.org/research/projects/finstructure).

Capital gain tax disadvantage: tax disadvantage on capital gains, available from World Bank Financial Structure database website at [www.worldbank.org/research/projects/finstructure](http://www.worldbank.org/research/projects/finstructure).

Explicit deposit insurance: dummy variable equal to one if the country had an explicit deposit insurance scheme in 1980, zero otherwise, available from World Bank Financial Structure database website at [www.worldbank.org/research/projects/finstructure](http://www.worldbank.org/research/projects/finstructure).

GDP per capita: GDP per capita in 1995 constant \$US, averaged over the period 1970–1990, from World Development Indicators CD-ROM.

Population: total population, averaged over the period 1970–1990, from World Development Indicators CD-ROM.

Creditor rights index: an index aggregating different creditor rights constructed by La Porta *et al.* (1998). The index value ranges from zero to four. A higher value means a higher level of creditor rights.

Antidirector rights index: an index aggregating the shareholder rights constructed by La Porta *et al.* (1998). The index value ranges from zero to six. A higher value means a higher level of minority shareholder rights.

Accounting standards index: an index assessing the adequacy of accounting system in each country, created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items. A higher score indicates a higher level of accounting standards observed. The data are available from La Porta *et al.* (1998).