Corruption and Financial System Structure

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Abstract

This paper shows the importance of government corruption in shaping the financial system structure in different countries. It argues that firm management under corrupt governments is particularly powerful in expropriating outside investors because corrupt government officials and firm management collude to loosen financial market regulation and weaken outside investors' legal protection. Corporate ownership concentration and a bank-oriented financial system under corrupt governments are means of improving corporate governance and protecting outside investors that make up for the absence of adequate legal protection for investors.

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0.1 Introduction

Corruption poses a major threat to corporations in many countries where government officials tend to abuse their executive power to seek personal gains in dealing with private businesses. Firms often give irregular extra payments or bribes when they apply for import and export permits, bid for public contracts or investment projects, and file loan applications etc. (World Economic Forum, 2001). Corruption exerts a wide-range impact upon corporate business activities. In terms of corporate finance, the earlier literature documents one direct effect of corruption: that is, corruption reduces the size of domestic investment and foreign direct investment (Mauro, 1995; Wei, 2000). This paper examines an indirect effect of corruption — corruption contributes to the prevalence of a bank-oriented financial system and concentrated corporate ownership structure. [2]

Recent research presents a diverse financial system structure pattern around the world. For instance, some countries have a bank-based financial system, while others a market-based one (Allen and Gale, 2000). Some countries have many widely-held corporations, while in many other countries concentrated ownership prevails (La Porta et al 1999a).

This research demonstrates that one critical factor in accounting for the variation in financial systems across countries is the severity of government corruption. Under corrupt governments, businesses must pay bribes to obtain government protection and substantial rents, and thus bribery becomes a primary precondition for the survival and growth of a firm. The empirical work of Fisman (2001) and Johnson and Mitton (2003) demonstrate clearly the contribution of political connections to firm value in crony capitalism.

Since the bribing of government officials by multiple parties from one corporation or bank would result in unnecessary transactions costs, the efficiency criterion dictates that it is optimal to delegate the task of bribing to the firm management, who runs the company on a day-to-day basis. The firm management thus acquires the government-relationship-specific human capital, which is vital to the firm's success. However, this has a dark side because it adds to the firm management's capability in expropriating outside investors. For example, firm managers can expand business expenditure for their own private benefits by reducing payouts to outside investors. To conceal their expropriation, firm managers can collude with government officials to blur the distinction between the "legitimate" business expenditure including paying bribes

[2] In earlier studies, Demirguc-Kunt and Levine (1999) detect a positive correlation between corruption and a bank-based financial system, whereas La Porta et al (1998) document a higher incidence of widely-held corporations in low-corruption countries. However, corruption is not the focus of their analysis. This research provides a framework and conducts systematic empirical analysis to study the relationship between corruption and financial system structure across countries.

for the firm's sake, and the "illegitimate" expenditure for their own empire building or perks. In order to uncover managerial expropriation, outside investors, accountants and auditors need to conduct intensive monitoring and in-depth investigation, which involve the risk of exposing government officials' bribe-taking activity to the public. To keep bribery a secret, government officials agree to collude with firm managers to deter outside investors and auditors from exercising corporate governance mechanisms. Government officials may, for instance, weaken the legal rights of outside shareholders in participating corporate decision-making, loosen the regulations of capital markets and listed companies, increase the procedural difficulty for shareholders to recover their investment losses arising from managerial misbehavior, and keep lax accounting standards to make corporate information flows opaque.

Under these circumstances, exercising corporate monitoring is costly and painstaking. Being a small shareholder in dispersed equity financing is simply unattractive because each small shareholder lacks the incentive to incur the cost to intensively monitor corporate management, while the government and legal institutions do not provide sufficient protection. This naturally lowers economic efficiency and shrinks the scale of external finance raised.

We argue that in the absence of adequate legal protection for outside investors, concentrated corporate ownership and a bank-oriented financial system can improve corporate governance or provide insurance to small investors to a large extent and thus expand the external funds raised.

Concentrated ownership structure 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 (Shleifer and Vishny, 1986; Burkart, Panunzi and Shleifer, 2003). It is also found that large shareholders usually participate and even control corporate management (La Porta et al, 1999a). Large shareholders thus often acquire government-relationship-specific human capital by bribing government officials; they can easily distinguish between "legitimate" and "illegitimate" corporate expenditure; they can prevent managerial expropriation without exposing government officials' bribe-taking to the public. Having acquired political capital themselves, large shareholders can prevent firm managers from asking government officials to deter corporate monitoring. This dramatically diminishes the firm management's power in expropriating outside investors and enhances economic efficiency. In some countries where family firms prevail, family owners as large shareholders may have a long tradition of maintaining close connections with government officials through bribery. Then large shareholders may exclusively acquire government-relationship-specific human capital, ruling out the possibility of managerial expropriation of shareholders by taking advantage of political connections.

Concentrated shareholding, however, can have a negative side. Block shareholders tend

to expropriate small shareholders for their own corporate control benefits (Morck, Shleifer and Vishny, 1988). This harms small shareholders' interests, which in turn restricts the size of external equity financing. However, as large shareholders own substantial interests in the corporation, expropriation of shareholders may harm firm value and thus large shareholders' interests in the corporation to some extent. Compared with dispersed equity financing where firm management has no block ownership, block equity interests may prevent large shareholders from excessively expropriating outside equityholders to a certain degree. We thus expect a more prevalent concentrated ownership pattern under more corrupt governments. Moreover, more severe corruption is expected to be associated with a higher degree of ownership concentration. Under a more corrupt government, as minority shareholders find the expropriation risk more threatening, they make less equity investment, which brings down market liquidity and contributes to ownership concentration. On the other hand, only a larger ownership share can align the interests of large shareholders and those of the firm by constraining their expropriation of minority shareholders. We thus expect to see a higher degree of ownership concentration under a more corrupt government.

Raising external funds through the banking system may be a more effective way to constrain management expropriation. In bank financing, depositors delegate corporate monitoring and investment decision-making to the bankers. By monitoring corporate management, making the lending policy fit the government's preferences and bribing government officials, bankers are able to acquire government-relationship-specific human capital. This enables bankers to have corporate monitoring strength similar to that of large shareholders. Bankers can easily distinguish "legitimate" bribe payments from "illegitimate" managerial expropriations without revealing bribe-taking by government officials; bankers with political connections can effectively prevent firm managers from asking government officials to deter their corporate monitoring.

More importantly, bank financing is appealing because it provides more protection for small outside investors against bankers' expropriation. This is a natural result of the market discipline power of demand deposits and government guarantee for deposits.

Banks have a unique capital structure: the bulk of finance comes from deposits that are fixed claims where the obligation of banks to depositors is contractually pre-specified and independent of the variation in the firm or bank's cash flow or asset value. Obviously, the expropriation of deposit investors by reducing promised payout is much easier to detect than that of equity investors. The bank run threat may generate market discipline that may effectively constrain bankers' expropriation: the contractual provision for bank depositors to claim investment on demand and the first-come-first-served sequential service arrangement create a credible threat of bank disintermediation should bank managers expropriate outside depositors.

In modern times, governments care about the banking system stability and often provide explicit, and particularly implicit, guarantee for bank deposits. This means the market discipline mechanism may not be brought into full play. However, the government guarantee for bank deposits enhances the safety of deposit investment and its attractiveness to small investors, and slants the financial system orientation toward a bank-oriented one. Implicit government guarantee for bank deposits is expected to be particularly relevant under corrupt governments[3]. Because implicit guarantee is not institutionalized, it offers much more room for corrupt government officials and bank and corporate managers to manipulate. With political capital, the bankers would lobby for government protection for banks and deposits, which brings safety to bankers. As any government rescue of insolvent banks is conducted 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 reward the bribe-making bankers and corporate managers.

Both the market discipline and government protection mechanisms encourage small investors to prefer to make deposit investments rather than equity investments. As a result, banks may create more liquidity and raises a larger amount of external investment than equity markets.

Under more corrupt governments, the corporate governance problem becomes more severe, and the strength of banks in raising external finance looms larger. We therefore expect to see a more prevalent bank-oriented financial system in countries with more corrupt governments.

The rest of the paper is organized as follows. Section 2 presents a simple reduced-form model showing why concentrated shareholding and bank-based financial systems prevail in countries with corrupt governments. Section 3 presents some empirical evidence that supports the model's predictions. Section 4 concludes the paper.

0.2 A Simple Model

0.2.1 Economic Setup

We consider an economy that consists of a government, an entrepreneur, a bank operated by a banker and outside private investors. The entrepreneur is capable of conducting some investment project but has no funds, so that she must turn to outside investors for external finance. Outside private investors can make equity investment into the firm, or they can pool their funds into a bank and delegate the banker to make the investment on their behalf by

[3] Explicit deposit insurance is much more prevalent in developed economies where governments have sufficiently large fiscal resources and maintain prudential regulation of banks (Li, 2003). Thus, in more corrupt and less developed economies, implicit deposit insurance should play a larger part.

extending loans to the firm. In any case, the entrepreneur does not own any shares in the firm. In other words, the entrepreneur is treated simply as a firm manager.

In this paper, we model corruption by assuming that the government conducts excessive regulation by setting up entry barriers to some segments of the economy under government protection. In approving firms for entry to these segments, government officials demand bribes in granting the permits to the firms. This kind of over-regulation creates a dichotomy in the economy. One side is the protected or favored sector where the government grants firms privileges and favorable treatment, and the other is the unprotected or unfavored sector where there is no government protection or privileges. Those firms that successfully curry favor with government officials are able to enter the protected sector.

There are three periods in the model. At date 0, the firm raises funds from investors to conduct an investment project. The firm management negotiates with the government official and pays a certain amount of bribes to the government official in order to enter the government-protected sector. The firm may borrow money from an outside creditor to cover the bribes. Because bribery is illegal, the firm manager justifies the funding needs as business expenditure for the purpose of establishing a good business nexus and covering various transactions costs such as licence fees. The firm may give priority to the repayment of this borrowing once the project is completed and the revenue is realized. For simplicity, we normalize the interest rate on the borrowing to be zero.

After paying bribes, the firm enters the protected sector, making a level of fixed investment I at date 0 to start the investment project. The firm manager promises to use the funds appropriately for investment purposes and to pay back all the remaining corporate earnings to investors (after repaying the borrowings for business expenditure including bribes) when the investment project is finished. Date 1 is an intermediate date when production is in process and no revenue is generated. The investment project is completed at date 2.

For an investment level I, the firm obtains revenue $Y_1(I)$ and $Y_2(I)$ from the unprotected and protected sectors respectively. Both $Y_1(I)$ and $Y_2(I)$ are concave functions, i.e., $\frac{dY_1}{dI} \geq 0$, $\frac{d^2Y_1}{dI^2} \leq 0$, $\frac{\partial Y_2}{\partial I} \geq 0$, and $\frac{\partial^2 Y_2}{\partial I^2} \leq 0$ hold. To ensure that investments in both sectors at least break even, we assume $Y_1(I) \geq I$ and $Y_2(I) \geq I$. If the investment project is liquidated at date 1, the liquidation value is $L(I)$. Again $L(I)$ is concave in I and satisfies $\frac{\partial L(I)}{\partial I} \geq 0$ and $\frac{\partial^2 L(I)}{\partial I^2} \leq 0$.

Enjoying various privileges and support, the firm in the government-protected sector reaps higher corporate earnings than a firm in the unprotected sector. We thus have the following assumption:

Assumption 1 For a given I, $Y_2(I) > Y_1(I) > L(I)$ and $\frac{\partial Y_2(I)}{\partial I} > \frac{\partial Y_1(I)}{\partial I} > \frac{\partial L(I)}{\partial I}$ hold.

Under this assumption, a firm in the government-protected sector receives higher levels of

total revenue and marginal revenue from investments than its counterpart in the unprotected sector. Moreover, the total and the marginal values from liquidation are smaller than those derived from operations in both the protected and the unprotected sectors.

After bribing government officials, the firm may be able to request government support and protection for various business plans in the changing business environment. Clearly, the maintenance of a long-term relationship with government officials requires constant interaction and communication. Firm management, who runs the company on a daily basis, is most likely to be responsible for the task and is thus able to acquire political connections. However, this human capital may strengthen the entrepreneur's ability to expropriate outside investors.

At date 1, the firm manager may expropriate shareholders by reneging on her promise to pay out all corporate earnings. She may put a proportion ϕ of the disposable corporate earnings (earnings after repaying borrowings) under her discretion, so that investors only receive the remaining $1 - \phi$. The manager may produce "reasonable" excuses to justify the increase in earnings retention. For instance, she may claim that higher-than-expected legitimate business expenditure is needed to complete the investment project. The manager can employ various tactics to make this excuse look legitimate. As shown by Clinard (1990), extensive and sizeable corporate bribery significantly distorts the corporation's actual financial picture, thus misleading stockholders as well as regulators and auditors.

However, this kind of expropriation could potentially be suspected and detected by shareholders, auditors and the courts. Realizing *ex post* that they were expropriated by corporate insiders, shareholders will lodge a complaint or bring a lawsuit against corporate insiders. As a result, the firm manager faces the cost of potential censure and punishment in expropriating shareholders. But this cost varies tremendously across countries with different degrees of corruption. The more corrupt the country is, typically the smaller the cost.

Because of the illegal nature of both managerial expropriation and bribe-taking, government officials and firm managers may collude to cover them up. For instance, government officials do not enact and enforce laws and rules to protect outside minority shareholders, make the procedure cumbersome for shareholders to recover losses from the managerial expropriation, and refrain from imposing stringent corporate accounting standards. This collusion is expected to increase in the severity of corruption as bribe-taking is more severe and prevalent under a more corrupt government.

We thus argue that the expected cost the firm manager faces (denoted as c) in expropriating shareholders is lower under a more corrupt government. It is a function of the degree of corruption and the amount expropriated. We use k to indicate the corruption index, where $k \in [0, \bar{k}]$, and $\bar{k}$ is a constant upper limit. As a convention in index construction, a higher

value of k corresponds to a lower degree of government corruption. The amount of expropriation is the product of ϕ and the amount of disposable corporate earnings after repaying the borrowing for the bribe. The cost function c satisfies the following property:

Assumption 2 c is a convex function in the amount of managerial expropriation, that is, $\frac{\partial c}{\partial \phi} \geq 0$ and $\frac{\partial^2 c}{\partial \phi^2} \geq 0$. A higher value corruption index implies a higher cost and a higher marginal cost of expropriation, i.e., $\frac{\partial c}{\partial k} \geq 0$ and $\frac{\partial^2 c}{\partial \phi \partial k} \geq 0$.

Through expropriation, the firm manager may obtain benefits B, which is a function of the amount extracted. B can be monetary benefits (for example, extra compensation to firm managers) or non-monetary private benefits (for instance, private benefits from perks) or a combination of the two.

Assumption 3 B is a concave function in the amount of managerial expropriation, that is, $\frac{\partial B}{\partial \phi} \geq 0$ and $\frac{\partial^2 B}{\partial \phi^2} \leq 0$.

In addition, we suppose that in a corruption-free society, the marginal cost of expropriation is much larger than the marginal benefit; in contrast, in an extremely corrupt country, the marginal benefit of expropriation will be much larger than the marginal cost.

Assumption 4 When k approaches $\bar{k}$, $c_\phi >> B_\phi$; when k approaches 0, $c_\phi << B_\phi$.[4]

0.2.2 Equity Financing

Dispersed Equity Financing

We start by considering the case where the firm is entirely financed by dispersed outside equityholders.

At date 0, the government establishes protected and unprotected sectors. Bribing government officials allows the firm to receive $Y_2(I)$ in the protected sector rather than $Y_1(I)$ in the unprotected sector. The differential in the earnings from the two sectors $(Y_2(I) - Y_1(I))$ constitutes the source of bribes.

Owing to the free-rider problem, in the dispersed equity financing scenario no equityholder has the incentive to participate in corporate management. Hence the entrepreneur will bribe the government official on behalf of outside investors.

Without loss of generality, we assume that the government official and the entrepreneur have equal bargaining power. Nash bargaining dictates that the firm and the government official will

[4] Assumptions 2 to 4 also apply to the case of concentrated equity financing where it is often the controlling block shareholders who expropriate outside minority shareholders. The benefits B can be extra earnings from self-dealing with related firms under the control of block shareholders. The controlling shareholders also face cost c in conducting expropriation.

equally share any gains to be made from entering the protected sector. The bribe that the firm makes to the government official is thus $b_0 = \frac{1}{2}(Y_2(I) - Y_1(I))$. The firm manager uses the borrowed funds to cover the bribe payment.

After the bribe is made, the firm enters into the protected sector and makes a fixed investment I. Through bribery, the entrepreneur exclusively acquires the government-relationship-specific human capital as no shareholder actively involves in corporate management. The firm manager can take advantage of her political connections to facilitate her expropriation of outside shareholders. [5]

At date 1, the disposable corporate earnings after repaying the borrowings for bribes are $Y_2(I) - \frac{1}{2}(Y_2(I) - Y_1(I)) = \frac{1}{2}(Y_1(I) + Y_2(I))$. The firm management may expropriate a proportion ϕ of this $(\frac{1}{2}\phi(Y_1(I) + Y_2(I)))$, and can in addition obtain benefits of $B(\frac{1}{2}\phi(Y_1(I) + Y_2(I)))$. For technical convenience, we assume that $B'(0) > 1$ and $B'(\frac{1}{2}(Y_1 + Y_2)) < 1$. In expropriation, the manager also faces an expected cost of $c(k, \frac{1}{2}\phi(Y_1(I) + Y_2(I)))$ for being punished *ex post* by legal institutions for her misconduct. The manager will choose a proportion of expropriation that maximizes her private benefits after subtracting the expected expropriation cost. To ensure that outside investors are willing to provide funds, the manager also needs to make them at least break even. At date 0, the equityholders rationally expect that for any investment I, they are able to obtain $\frac{1}{2}(1 - \phi)(Y_1(I) + Y_1(I))$ at date 2. Hence, the amount of funds that could be raised (I) must satisfy the individual rationality condition of $\frac{1}{2}(1 - \phi)(Y_1(I) + Y_2(I)) \geq I$. We have the following program for the optimal level of managerial expropriation in dispersed equity financing (ϕ^{DE}):

$$\max_{\phi} \quad B(\tfrac{1}{2}\phi(Y_1(I) + Y_2(I)) - c(k, \tfrac{1}{2}\phi(Y_1(I) + Y_2(I)))$$
$$s.t. \quad \tfrac{1}{2}(1 - \phi)(Y_1(I) + Y_2(I)) \geq I \qquad (1)$$

It is easy to see that no managerial expropriation occurs in a corruption-free society, whereas managerial expropriation reaches the highest level when corruption is most severe. In practice, almost all countries have some minimum legal institutions, but at the same time legal institutions are not perfect or adequate enough to ensure a society without corruption. Hence we focus on the most realistic case where the corruption index (and thus the degree of corruption) lies between the two extreme ends.

Lemma 1 *When the value of the corruption index* (k) *lies in the intermediate range, a*

[5] As argued by Shleifer and Vishny (1997), the shareholders cannot bribe the firm manager not to expropriate investors because of the legal duty of loyalty to shareholders that managers are supposed to have. This further implies that paying excessive salaries and bonuses to managers may be regarded as a covert act of bribing managers and may arouse public resentment. As a result, a high-powered managerial compensation scheme may not be able to fully align management's and owners' interests. Managerial expropriation hence becomes a serious concern.

decrease in the degree of corruption corresponds to a lower level of managerial expropriation.

The optimal level of investment funds that can be raised is determined by:

$$\max_{I} \; Y_2(I) - \tfrac{1}{2}(Y_2(I) - Y_1(I)) - \tfrac{1}{2}\phi^{DE}(Y_1(I) + Y_2(I)) - I \qquad (2)$$

In other words, the optimal investment I^{DE} is chosen to maximize profits after subtracting bribes, managerial expropriation and initial investment from corporate earnings. We therefore reach the following conclusion:

Proposition 1 *In the dispersed equity financing case, the optimal amount of investment funds raised is higher when corruption is less severe.*

This result suggests that corruption and the resultant deterioration in corporate governance may prevent the development of equity markets.

Concentrated Equity Financing

In the concentrated equity financing scenario, one block shareholder owns a substantial proportion of the total stocks outstanding, while the remaining stocks are held by dispersed small shareholders. Each small shareholder is still prone to the free-rider problem in monitoring the manager. To make our analysis interesting, we consider the situation where the block shareholder finds the expected benefit from monitoring overwhelms the cost. The large shareholder typically participates in corporate decision-making on various aspects including bribery. As with the case of dispersed equity financing, the firm and the government officials negotiate over the bribe payment, which leads to the same amount of bribe payment, i.e., $b_0 = \frac{1}{2}(Y_2(I) - Y_1(I))$.

After the bribery process, both the block shareholder and the firm manager are able to acquire the essential government-relationship-specific human capital. In some countries, family owners have a long tradition of controlling and operating the company. Oftentimes several generations of those family owners have maintained close connections with government officials through means such as bribery (see, for example, Fisman, 2001 and Johnson and Mitton, 2003). Then the government-relationship-specific human capital may be mostly or entirely endowed in the large shareholder rather than in the firm management.

The possession of government-relationship-specific human capital helps the block shareholder establish resistance to managerial expropriation. If the firm manager expropriates shareholders by reducing corporate payouts, the large block shareholder can intervene to investigate whether the excuse offered by the firm manager is justifiable. The firm manager cannot take advantage of her political connections to petition government officials to prevent the large shareholder from conducting corporate monitoring because the large shareholder also has the political capital. Furthermore, as the large shareholder participates in bribing government officials, he

can ensure the government officials that he will be able to distinguish managerial expropriation from bribe payments without revealing government officials' bribe-taking.

However, the large shareholder can potentially expropriate small shareholders by siphoning corporate financial resources out of the firm to increase his own wealth or private benefits (Johnson et al, 2000; Claessens et al, 2002). As tunneling often occurs in the process of conducting investment and business operations, we model tunneling as the block shareholder siphoning a proportion ϕ of corporate earnings.

Suppose that a block shareholder contributes a proportion α to the investment funds. α can take value such as 10%, 20%, 50%, etc.[6] Conducting tunneling, the block shareholder siphons off a proportion ϕ of the corporate earnings after bribery, i.e., $\frac{1}{2}\phi(Y_1(I)+Y_2(I))$. The block shareholder obtains benefits B from tunneling as a function of the amount tunneled $(B(\frac{1}{2}\phi(Y_1(I)+Y_2(I))))$. However, as a stockholder, he also incurs a loss of $\frac{1}{2}\alpha\phi(Y_1(I)+Y_2(I))$. Here B can include both private benefits and monetary revenue. The block shareholder will decide on the proportion of tunneling by maximizing his net benefits subject to equityholders at least breaking even, that is,

$$\max_{\phi} \; B(\tfrac{1}{2}\phi(Y_1(I)+Y_2(I))) + \alpha[\tfrac{1}{2}(Y_1(I)+Y_2(I)) - \tfrac{1}{2}\phi(Y_1(I)+Y_2(I)) - I] - c(k, \tfrac{1}{2}\phi(Y_1(I)+Y_2(I)))$$

$$s.t. \;\; \tfrac{1}{2}(1-\phi)(Y_1(I)+Y_2(I)) \geq I \qquad (3)$$

We thus have the following conclusion:

Proposition 2 *When k is in the intermediate range, for a given level of k, concentrated equity financing can yield a smaller expropriation than dispersed equity financing does. When corruption worsens (k becomes smaller), if $\frac{\partial^2 c}{\partial\phi\partial k}$ is sufficiently small, concentrated equity financing can be a way of preventing the expropriation of small investors from worsening, and produces a lower degree of expropriation than dispersed equity financing does. A higher degree of corruption requires a higher degree of ownership concentration to reach this end.*

The condition of a sufficiently small $\frac{\partial^2 c}{\partial\phi\partial k}$ implies that the marginal cost of expropriation faced by the block shareholder would not drop too much when corruption worsens. This makes it possible for concentrated corporate ownership to play a role in mitigating the expropriation of outside investors.

The optimal level of investment funds that can be raised in concentrated equity financing is thus determined by the following program:

$$\max_{I} \; Y_2(I) - \tfrac{1}{2}(Y_2(I)-Y_1(I)) - \tfrac{1}{2}\phi^{CE}(Y_1(I)+Y_2(I)) - I \qquad (4)$$

[6] For simplicity, here we consider the case where the block shareholder doesn't face wealth constraints so that he may maintain a certain proportion of ownership share when the total amount of equity funds raised expands.

Comparing the size of equity financing raised in the cases with and without concentrated ownership, we have the following result:

Proposition 3 *When k lies in the intermediate range, concentrated equity financing may raise a larger amount of funds than dispersed equity financing does.*

Propositions 2 and 3 suggest that small shareholders may be subject to a less expropriation in concentrated equity financing than in dispersed equity financing because the large shareholder can exercise corporate monitoring on the one hand and expropriate small shareholders to a lesser extent on the other hand. The results imply that in more corrupt countries we may observe a more prevailing and higher degree of corporate ownership concentration because the more serious corporate governance problem in corrupt countries requires concentrated ownership to strengthen corporate governance and enlarge external finance raised. [7]

0.2.3 Bank Financing

We now turn to bank financing. For simplicity, we assume away bank capital and let deposits be the bank's only financial resource. As a benchmark case, the bank extends a loan to the firm, and the entrepreneur conducts business operations. Before the investment is started, the entrepreneur and the banker coordinate their efforts to bribe government officials in order to enter the protected sector at date 0.

Typically the bank also needs to bribe government officials to secure government protection and favorable treatments in its banking operations. Moreover, in our framework, if the banker does not bribe the official to acquire political capital, the bank could easily be expropriated by the entrepreneur. For instance, the firm may maliciously default on its loan and prevent the bank from capturing firm assets or collateral under the auspices of the corrupt government officials. It is therefore in the interests of the banker to work with the entrepreneur to bribe government officials, and both of them acquire political capital. The amount of bribe made at

[7] One may be tempted to explain the association between ownership concentration and corruption by arguing that large shareholders may find it more worthwhile to bear the transactions costs involved in bribing government officials. In this view, there may be some fixed costs associated with the bribery that include the costs of the bribe itself and those of making efforts to keep close contact with government officials. Block shareholders with a large stake in the company are more likely to be willing to bear these costs because their proceeds from business operations after bribery are more likely to cover the cost of bribery. This explanation has its weakness. It is not necessarily the case that the bribery cost should be borne by one or a few shareholders. Under a corrupt government, bribery is essential to firm survival and growth. The cost of bribery can be treated as part of the legitimate business expenditure and be shared by all equityholders. As shareholders understand the central importance of bribery in business success, they are willing to share in bribery costs according to the proportion of their stockholding, and delegate the task of bribing to the firm managers who do not need to hold any stock in the company, which turns out to be equivalently efficient in fulfilling the bribery task. We therefore emphasize the role of large shareholders in strengthening corporate governance rather than initiating bribery per se.

date 0 is the same as that in the case of equity financing. For simplicity and consistency, we suppose that the bank may borrow funds from another bank to cover the bribe.

Bank Financing with Market Discipline

At date 1, endowed with the government-relationship-specific human capital, the banker can constrain the entrepreneur's opportunistic behavior. If the entrepreneur tries to expropriate the bank by strategically defaulting on bank loans, the banker can investigate her excuses and distinguish between bribes and managerial expropriation. The banker can assure the government officials that he will detect managerial expropriation without revealing their bribe-taking. To avoid unnecessary complications, we follow Diamond and Rajan (2000) in assuming that the bank would have claim to the full value of the firm upon liquidation.

The strength of bank financing lies more in preventing bankers from expropriating outside small investors. 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 banker's expropriation of outside depositors. If the banker misuses a proportion ϕ of bank earnings and reduces the promised repayment to depositors, there would be a run on the bank. Under the first-come-first-served sequential service arrangement, it is rational for each individual depositor to run to the bank and withdraw his deposits ahead of the others.

Since the bank assets are illiquid at date 1, the depositors will liquidate the bank. Then the depositors would negotiate directly with the entrepreneur. Because the firm's assets exist in the form of long-term illiquid investment, the lack of collective action will again lead to the immediate liquidation of the company, which yields a liquidation value of $L(I)$. This is also the market value of the deposits.

As pointed out by Diamond and Rajan (2000, 2001), bank finance has strength in liquidity creation. Suppose that the bank initially raises more than $L(I)$ from depositors. Since the market value of debt is smaller than the total amount of deposits, it is individually rational for each depositor to rush to claim the deposits ahead of others once expropriation occurs, which would lead to the disintermediation of the bank. This would help discipline the banker and in turn enable the banker to build up a pre-commitment to not expropriating outside investors. As a result, for investment I, outside depositors expect to obtain $Y_2(I) - \frac{1}{2}(Y_2(I) - Y_1(I)) = \frac{1}{2}(Y_1(I) + Y_2(I))$ at date 2.

Bank Financing with Implicit Deposit Insurance

In modern societies, governments care about the stability of the banking system. In almost all countries, bank deposits are the most basic form of wealth holding. Instability of the banking system will most likely cause social instability. The fixed claim nature of the bank deposits further facilitates the compensation for depositors once bank insolvency occurs.

At date 0, once the firm and the bank enter the government-protected sector after paying bribes, the close connection between the government and the bank prompts outside investors to believe that government will rescue the bank once bank insolvency occurs. [8]The bank may raise an amount of deposits that is larger than $L(I)$.

At date 1, the banker and the firm manager may collude to expropriate outside deposit investors by misusing a proportion ϕ of the disposable earnings. As they also face the expected cost of punishment after being detected, the determination of ϕ follows the same procedure as in the case of dispersed equity financing. The banker and the firm manager may petition the government official to rescue the bank by using fiscal resources to cover the managerial expropriation. The government official is expected to agree on the basis of the following considerations. First, if government doesn't bail out the banks and insure deposits finally, the bank run would occur, which is what the government doesn't like to see. Second, government officials cannot effectively prevent the firm and bank managers from expropriating outside investors. If they impose strong regulation to maintain the transparency of the corporate sector, their own bribe-taking behavior is likely to be exposed. Third, it sounds totally legitimate to use fiscal resources to cover the bank's operational losses or bail out insolvent banks for the purpose of protecting outside investors' interests. As the reasons for bank losses could be multi-pronged, there is much room to cover up the real cause of bank losses.

Once determined to rescue the bank, the government may signal its intention to ensure the stability of the banking system. The deposit investors would thus keep holding a strong conviction that the government would be responsible for the safety of bank deposits. Hence, for investment I, outside depositors expect to obtain $Y_2(I) - \frac{1}{2}(Y_2(I) - Y_1(I)) = \frac{1}{2}(Y_1(I) + Y_2(I))$ at date 2.

In the scenarios of bank financing with either market discipline or implicit government guarantee, the deposit investors expect to obtain a repayment of $\frac{1}{2}(Y_1(I) + Y_2(I))$ for an initial

[8]As pointed out by Krugman (1998) and Kang (2002), depositors in many countries take government guarantee for bank safety for granted. The close government-business connection in many countries such as those in East and Southeast Asia further reinforces the conviction that governments have an implicit guarantee for banks and will bail out the banks once they are insolvent. In more corrupt countries, this kind of belief is expected to be stronger because bankers may well ask for government rescue as a reward for bribery.

investment of I. The optimal level of investment funds that can be raised through bank financing is determined by

$$\max_{I} Y_2(I) - \tfrac{1}{2}(Y_2(I) - Y_1(I)) - I$$
$$\text{s.t.} \quad \tfrac{1}{2}(Y_1(I) + Y_2(I)) \geq I \qquad (5)$$

Comparing external finance raised from equity financing and bank financing, we reach the following conclusion:

Proposition 4 *Bank financing raises more external funds than both dispersed and concentrated equity financing do. The difference in the size of external funds raised under bank financing and equity financing increases with an increase in the degree of corruption.*

Our theory suggests that bank financing can achieve an effectiveness in monitoring corporate management similar to that of concentrated equity financing, whereas depositors are better protected against expropriation through bank run threat or government implicit guarantee. This allows a larger amount of external finance to be raised through bank financing.

Weaker corporate governance under a more corrupt government would raise a smaller amount of equity investment from outside equityholders, but bank financing may still raise a fairly large amount of external deposit investment. As a result, bank financing is more prevalent under a more corrupt government, and the importance of bank financing relative to equity financing increases in the degree of government corruption.

In practice, both bank run threat and implicit guarantee account for the relative safety of deposits. Even with implicit and explicit deposit insurance, as long as they have limited coverage or there are some chances that the government bailout will not be carried out, the market discipline mechanism still works to a large extent [9]. But it is also true that modern governments tend to rescue ailing banks, and implicit government guarantee for deposits is prevalent. Thus implicit guarantee plays an important role in enhancing bank financing under corrupt governments.

0.3 Some Empirical Evidence

0.3.1 Model Predictions

Our theory mainly produces the following predictions:

1. Government corruption leads to a prevalence of concentrated corporate ownership structure, that is, a larger proportion of corporations will have large controlling shareholders instead

[9] As shown by Kane and Demirguc-Kunt (2001), almost all the countries that have explicit deposit insurance only provide limited coverage.

of being widely-held under a more corrupt government.

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

3. A bank-oriented financial system is more likely to be the primary source of external corporate finance in countries with more corrupt governments.

Our theory further argues that corruption shapes financial system structure mainly through its negative impact on corporate governance. For example, corruption facilitates collusion between government officials and corporate management in keeping an opaque corporate information disclosure system, raising the procedural difficulty for shareholders to recover losses from equity-issuing companies, and weak investor rights in corporate decision making.

0.3.2 Measuring Corruption

A complete description of the data used in this paper is relegated to 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 indexes that compare the degree of corruption in different countries. Rather than objective and quantitative measures of actual corruption, these indexes are based on a survey of how international business people and financial journalists perceive corruption in different countries. The two most widely used corruption indexes are those compiled by the Transparency International (TI) and the International Country Risk Guide (ICRG). For both indexes, the higher the index value, the less corruption a country's government is subject to. The TI corruption index is a synthesis of many international surveys of business people, political analysts and the general public on their perception of corruption in numerous countries around the world. It assesses the perception of corruption on a scale of 0 to 10. Ten refers to a corruption-free country, while zero refers to a country where most transactions or relations are tainted by corruption. Similarly, the ICRG index also assesses government corruption with a scale from zero to ten. A lower (higher) score indicates that government officials are more (less) likely to demand special payments or illegal payments in the form of bribes connected with import and export licenses, exchange controls, tax assessment, policy protection, or loans. Though substantial efforts have been made to reduce bias and ensure consistency of the two corruption indexes, we form a composite corruption index by taking the average of the TI and ICRG corruption indexes to further mitigate the potential bias in index construction.

Table 1 gives a summary of the major variables used in this paper.

0.3.3 Basic Regression Results

1. Corruption and the Prevalence of Widely-held Companies

La Porta et al (1999a) construct a cross-country dataset on the prevalence of widely-held corporations (the proportion of widely-held corporations among large corporations) for the world's 27 richest countries. We extend this data construction to 41 countries around the world that include both developed and emerging economies (see Table 1 for the complete sample data). We adopt two alternative definitions of concentrated ownership. A firm is said to have a controlling shareholder if the sum of a shareholder's direct and indirect voting rights exceeds either 10 or 20 percent, which are called the 10% criterion or the 20% criterion. Widely-held companies are companies that have no controlling shareholder.

Before going to systematic regression analyses, we first have a look at the scatterplot in Figure 1. It presents a positive correlation between the proportion of widely-held companies and the corruption index: that is, a lower degree of corruption is associated with a higher proportion of widely-held companies.

Table 2 shows regression analyses that examine how corruption affects the proportion of large widely-held corporations around the world. We present two sets of regressions where the dependent variable is the proportion of widely-held companies based on the 10% and 20% criteria respectively.

When the corruption index is the lone independent variable, we see that a lower degree of corruption is statistically significantly associated with a larger proportion of widely-held corporations. We then control for the logarithm of population, logarithm of GDP per capita and the Gini coefficient in regressions. 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 ground that the richer countries might have different ownership patterns than poorer ones. We add the Gini coefficient because countries with quite unequal income and wealth distribution tend to produce a small 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 required to purchase a significant number of shares. As a result, a higher inequality may lead to a more prevalent concentrated corporate ownership structure.

The regression results in Columns 3-4 and 6-7 of Table 2 confirm that a lower degree of corruption is statistically significantly associated with larger chances of observing widely-held

companies among the largest firms. The 10% and 20% criteria produce consistent results. It is also the case that larger economies have more widely-held companies. There is significantly positive linkage between how rich the country is and the prevalence of widely-held companies. However, the regression results do not show any strong and clear connection between the Gini coefficient and the proportion of widely-held companies.

It is worth noting that the impact of corruption on the prevalence of widely-held companies is not only statistically but also economically significant. If we take the estimated coefficient on the corruption index in the final column regression (0.085), an increment of one in the corruption index will raise the proportion of widely-held companies using the 20% criterion by 8.5%. For instance, if Mexico dramatically cleaned up its government so that its corruption index increased from its present level of 3.055 to the US level of 6.32, the proportion of widely-held companies in Mexico would surge from its current ratio of zero to 27.75%.

2. Corruption and the Ownership Share of Large Shareholders

In table 3, we conduct regression analysis to investigate the relationship between the mean and median ownership share of the top three largest shareholders and the corruption index. The control variables are the same as those in table 2. The regressions confirm what we observe in Figure 2, i.e., a more serious corruption leads to higher mean and median levels of stock ownership of large shareholders. Take the estimated coefficients of the corruption index in the third and the sixth columns in Table 3 (-0.062 and -0.080 respectively) as an example. A unit increment in the corruption index would reduce the mean and median proportion of shareholding of top three largest shareholders by 6.2% and 8.0% respectively.

There is also some strong evidence that large shareholders own a smaller mean and median proportion of stocks in countries with a larger size. However, there is no significant relationship between the richness of a country or inequality in income distribution and the mean or median ownership share of large shareholders.

3. Corruption and Bank-oriented vs. Market-oriented Financial Systems.

Our theoretical analysis points out the pronounced impact of corruption on financial system orientation. Financial system orientation or financial system structure mainly refers to the relative importance of equity capital markets and banks in a financial system. 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 versus that of the banking system. We first use the ratio of stock market capitalization of listed companies over deposit money bank assets (average over 1990-97): that is, the relative size of stock markets vs. banks in terms of the value of asset stock. We then use the ratio of stock market value traded over domestic bank credit (average over 1990-97) to measure the relative importance of

capital markets and commercial banks in corporate finance. This measure represents the ratio of two flow variables. The higher these two ratios are, the more market-oriented the financial system is. The last measure of financial system orientation is an aggregate financial structure index constructed by Levine (2000). A higher value of this index indicates a more market-based financial system.

Figures 3-5 depict a positive correlation between the corruption index and the measures of the importance of the equity market relative to the banking industry in a financial system. The message conveyed by these figures is quite clear: a country with a lower degree of corruption has a more market-based financial system.

In Table 4, we focus on the logarithm of the ratio of listed companies' stock market capitalization to deposit money bank assets. We run OLS regressions with different specifications to examine the relationship between the degree of corruption in a country and the financial system structure. We control for logarithm of population and logarithm of GDP per capita on the ground 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 dividend tax disadvantage and capital gain tax disadvantage in different countries.

As we noticed in the theoretical argument, explicit deposit insurance may enhance the safety of bank deposits and the size of deposit investment. We thus include a dummy variable in our regressions indicating whether an explicit deposit insurance scheme existed in a country in 1980, a year before the period over which the data for our financial system structure 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 consistently and statistically significantly that countries with more severe corruption tend to have a more bank-oriented financial system. Moreover, larger countries are more likely to have a more market-oriented financial system. We can obtain qualitatively equivalent results when we substitute the logarithm of GDP for the logarithm of population as a proxy for the size of a country. The estimated coefficient of the logarithm of GDP per capita is not stable. It can be statistically insignificant or significantly negative. One conclusion we can reach is that GDP per capita cannot take away the statistical significance of the corruption index; 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 gain tax disadvantage tend to promote a more bank-oriented financial system, but their effects are not statistically significant. There is strong evidence that an explicit deposit insurance scheme will promote a bank-based financial system.

As shown in Table 5, we extend our examination to the two alternative measures of financial system orientation, i.e., the logarithm of the ratio of stock market value traded to domestic bank credit and the aggregate financial structure index. Through various regression specifications, we find consistent and statistically significant evidence that a lower degree of corruption is associated with a more market-oriented financial system. [10]

The effect of corruption on financial system orientation is economically significant. According to the smallest coefficient on the corruption index in Table 4 (0.17), a one-standard-deviation increase in the corruption index (1.84) would increase the logarithm of the ratio of market capitalization to deposit money bank assets by 0.31, where the mean and standard deviation of the log ratio are -0.89 and 1.25 respectively. Moreover, the estimates can explain why countries such as China and Italy with severe government corruption (corruption index values of 3.37 and 3.84 respectively) have more bank-oriented financial systems (log ratios of -2.37 and -1.49 respectively) than Sweden (ratio of 0.28), which has a corruption index of 7.6.

0.3.4 IV Regressions — Religious Composition as IV

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 favorable treatment from government officials. Secondly, 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. The cultural theory of institutions states that different societies developed different cultures, including work ethics, tolerance, trust and other characteristics of a society, that help shape the different government and legal institutions. Religions play an important role in shaping the culture and thus the government quality (see La Porta et al, 1999b). As corruption is one central feature of gov-

[10] Because of the variation in sample size for different dependent and independent variables, there is variation in sample size for different regression specifications in this study.

ernment quality or government efficiency, religions are expected to cast a profound impact on the degree of corruption. Similarly, Landes (1998) and Inglehart (2000) also argue that the Catholic and Muslim religions tend to generate hierarchical bonds of authority and centralized organization in churches, while Protestant churches are more decentralized. The organization of churches helps shape the structure of government institutions. According to Putnam (1993), hierarchical churches led to less horizontal interpersonal trust, generating state intervention and facilitating government corruption. We thus make use of religious composition, i.e., the proportions of population in each country that follow the Protestant, Catholic and Muslim religions 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 Table 8 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 see that, except for the proportion of Catholics followers, the religious variables are strongly correlated with corruption. 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 Panels 1 and 2 of Table 6. For both ownership concentration and financial system orientation, the TSLS regressions basically confirm the results derived from the OLS regressions. 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 religious composition variables affect corporate ownership patterns and financial system orientation only through their effects on the quality of government institutions, i.e., 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.

0.3.5 IV Regressions – A Natural Experiment in Former Colonies

We choose settler mortality as an alternative instrumental variable for corruption. In doing so, we conduct a natural experiment within the former European colonies. Endowment theory argues that different European colonies were endowed with different environmental conditions, for which Europeans adopted different types of colonization strategy. Settler colonies and ex-

tractive colonies are two benchmark cases. Settler colonies have favorable 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 threatened 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 more accountable and democratic post-colonial governments, while in extractive colonies 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.

Settler mortality is constructed to measure the environmental conditions and thus institutional quality for former colonies. It is an overall measure of annualized deaths per thousand European soldiers in the early 19th 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 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 Table 8 the regression of the corruption index on the logarithm of settler mortality among former European colonies within our sample. Clearly, a higher level of settler mortality leads to a higher degree of corruption, and the effect is statistically significant at the 1% level. Acemoglu et al (2001) have shown convincingly that settler mortality is a valid instrumental variable for institutional strength. The first stage regression we conduct here 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 the prevalence of widely-held corporations and the degree of ownership concentration 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 Table 7. Firstly, we let the corruption index be the lone

independent variable to see how corruption affects the financial system orientation. Secondly, 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. Though multivariate regressions produce less statistically significant results than univariate regressions do, we can still conclude that a lower degree of corruption leads to a more bank-oriented financial system.

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 oftentimes significant differences exist between the results of the OLS regressions and those of the TSLS regressions.

0.3.6 Panel Data Analysis

So far, our statistical analyses are cross-section regressions based on the data for the period 1990-97. In this section, we conduct panel data analysis on financial system orientation.[11] The data measured as the ratio of stock market capitalization to deposit money bank assets can be traced back to 1976 for our sample. However, the systematic compilation of corruption indices starts as late as in the 1980s. The ICRG corruption index that we use as a component of our composite corruption index has data available going back to 1985.[12] Because of the stability of financial system structure and the ranking of different countries in the corruption indices during a relatively short period of time, we examine the relationship between corruption and financial system structure for every five years starting from 1985. In other words, we treat every five years as a period and divide the sample of the dependent variable into three periods: 1986-90, 1991-95 and 1996-97[13]. 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 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 data, we choose two methods to conduct the panel data regressions: fixed effects and random effects regressions. Furthermore, random effects regressions are essential for another important reason. There is no substantial

[11] There is no time variation in the currently available data on the proportion of widely-held corporations among large companies, so we cannot conduct panel data analysis.

[12] The systematic compilation of the TI corruption index started only in the mid-1990s.

[13] The sample ends in 1997.

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 9, we first present regression results controlling for country fixed effects. We include regressors with time variation such as the corruption index, the logarithm of population, and the logarithm of GDP per capita. Despite its limited time variation, the corruption index still produces quite strong effects on financial system structure in the fixed effects regressions: a less corrupt government contributes to a more market-oriented financial system. This further relieves us of our concern for reverse causality. In addition, it also helps mitigate the potential concern that both financial structure and government corruption are driven by an unspecified exogenous variable.

We next present several specifications for random effects regressions in Table 9. The regressions incorporate all variables examined in the preceding tables. The regression results again show quite strongly and consistently that a lower degree of government corruption contributes to a more market-oriented financial system.

0.3.7 Corruption, Corporate Governance and Financial System Structure

Our theory emphasizes that corruption shapes financial system structure through its effects on corporate governance. Corporate managers may take advantage of their political capital to facilitate their expropriation of outside investors. In order to cover up their bribe taking, government officials may collude with corporate management to weaken corporate governance. We argue that concentrated corporate ownership and a bank-based financial system may mitigate the corporate governance problem under a corrupt government to some extent. In empirically investigating whether corruption casts a shadow on financial system structure using corporate governance, we adopt some country-level measures of corporate governance such as investor rights, the procedural difficulty in civil lawsuits for investors to recover losses arising from managerial misbehavior and corporate information disclosure standards.

1. Corruption, Investor Rights and Financial System Structure

The law and finance literature emphasizes the role of investor rights, particularly minority shareholder rights and secured creditor rights, in determining the size of external finance around the world (LaPorta et al, 1998). Our theory suggests that under a corrupt government, corporate management, large shareholders and bankers may confuse bribe payments with necessary

business expenditure so as to expropriate outside investors. To deter outside investors and auditors from conducting corporate monitoring and detecting expropriation, those corporate insiders may ask government officials to enact, interpret, and implement the legal codes in their favor, which lead to weak minority shareholder rights. In the same vein, large bankers, who account for the majority of secured creditors, may also ask government officials for more legal protection for secured creditors. Corrupt government officials would like to assist corporate insiders and bankers because outsider monitoring will ultimately expose their illegal bribe-taking activities. This may slant the legal protection toward corporate management, large shareholders and large bankers, while small shareholders and small depositors will receive inadequate legal protection under a corrupt government.

In the absence of strong legal protection, small shareholders are particularly vulnerable to managerial expropriation. Their participation in equity markets is rather limited, and they rely on large shareholders to strengthen corporate governance. In contrast, small depositors are better protected because of the potential bank run threat and implicit government guarantee for deposits. As a consequence, a more corrupt government will lead to a more bank-oriented financial system.

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 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 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 -0.15. 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 structure, we adopt an empirical strategy that is similar to Acemoglu et al (2003): we introduce investor rights indices into our regressions. [14]We 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

[14]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.

investor rights indices are significant, investor protection may be regarded as the primary corporate governance mechanism for corruption to affect financial system structure. If both the corruption index and the investor rights indices are statistically significant, the two variables may both have independent effects on financial system structure, and investor rights can be one significant way through which corruption affects financial system structure. We may further compare the magnitude of estimated coefficients of corruption 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 significant, we may conclude that corruption shapes financial system structure through channels other than investor rights.

In terms of ownership concentration, we expect that a higher value of the antidirector rights index is associated with a more dispersed ownership structure because better legal protection of minority shareholders encourages more active participation from small shareholders, which in turn may lead to a dispersed shareholding. In Table 10, the regressions in Columns 2-5 of Panel 1 show that when we don't include the Gini coefficient, both the corruption index and the antidirector rights index are statistically significant in explaining the prevalence of widely-held companies. Comparatively speaking, the antidirector rights index has higher statistical significance than the corruption index does. The estimated coefficients of the corruption index also diminish to some extent compared with the corresponding ones without investor rights index in Table 2. After the Gini coefficient is included, the corruption index loses statistical significance whereas the antidirector rights index remains significant. This suggests that minority shareholder rights serve as a major channel for corruption to affect ownership concentration.

Columns 6-9 of Panel 1 look at the mean and median ownership share of largest shareholders. The corruption index remains consistently statistically significant. The estimated coefficients of the antidirector rights index are either less significant than those of the corruption index or totally insignificant. We thus conclude that the minority shareholder rights are at most a relatively weak channel to mediate the effects of corruption on the degree of corporate ownership concentration.

We then turn to financial system orientation. As shown by the law and finance literature, a higher value of the antidirector rights index contributes 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 a larger size of 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 through bank run threat and deposit insurance, we thus expect that a higher creditor rights index would promote bank financing.

As we are studying financial system orientation or the relative importance of banks and 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 means the financial system slants toward a market-based system rather than a bank-based one.

Regressions in Panel 2 of Table 10 provide evidence that a lower degree of corruption contributes to a more market-oriented financial system, which exerts a statistically significant effect even after we control for investor protection. At the same time, we also see that stronger legal protection for minority shareholders relative to secured creditors does promote a more market-based financial system, and this effect is statistically significant in most of the regressions. But the estimated coefficients of this difference in investor rights variable are no more statistically significant than those of the corruption index. Compared with the regressions with similar specifications in Tables 4 and 5 without controlling for the investor rights variables, the estimated coefficients of the corruption index change little in regressions with stock market capitalization/bank asset value and aggregate financial structure index as the dependent variables, but become substantially smaller in regression with stock market trading value/bank credit as the dependent variable. We thus conclude that investor rights are one significant corporate governance channel, though not necessarily the only primary channel.

2. Corruption, Liability Standards and Financial System Structure

The minority shareholder rights index mainly gauges their rights to participate in corporate decision-making. Our theory suggests that corrupt government officials and corporate management can collude to deter outside investors from holding corporate management liable for the investment losses arising from managerial expropriation. They may deliberately increase the level of procedural difficulty and thus costs for outside investors to file a lawsuit for misbehaving corporate managers or large shareholders.

LaPorta et al (2004) construct a liability index to reflect the burden of proof for outside investors that want to sue the corporate managers who cause investor losses through ways such as releasing misleading information. It turns out that countries differ substantially in the restrictiveness of liability standards. For example, in dealing with investor losses stemming from corporate managers' misleading information release, the common standards require plaintiffs to prove that the defendants were negligent in omitting essential information (the negligence standard), to prove that they relied on the misleading information to make investment (the reliance standard) and their losses were caused by the misleading information release (the causality

standard). Some countries impose particularly demanding extra standards by requiring the plaintiffs to show that the defendants either knew about the omission or acted with intent or gross negligence in providing misleading corporate information. In contrast, some countries adopt less demanding burden of proof that require the plaintiffs to prove reliance or causality or both, but not negligence. In some countries, the burden of proof is even lower. The plaintiffs only need to show that the information is misleading, but there is no requirement for the reliance or causality standards. It is the defendants that must show that they exercised due diligence in preparing the prospectus in equity issuance. The liability standard index achieves a higher score when there are fewer liability standards to meet and the burden of proof is lighter.

We expect that under a more corrupt government, government officials may increase the liability standards, making it more difficult for outside shareholders to hold corporate managers accountable for their misbehavior. This will reduce the attractiveness of equity as an investment form. In contrast, bank deposits are fixed claim. Any failure to repay depositors the full amount of principal and interest constitutes a breach of contract, and the banks can be held liable for it. In this sense, minority equityholders are particularly vulnerable to the burden of proof in showing managerial expropriation.

To examine whether liability standards act as a channel mediating the effects of corruption on financial system structure, we include the liability standards index in our basic regressions. In Panel 1 of Table 11, we first look at the impact of corruption on the prevalence of widely-held corporations. Both the corruption index and the liability standards index show positive impact. The corruption index remains statistically significant, but its significance weakens compared to regressions in Table 2 (for the case of using the 20% criterion). The liability standard index turns out very statistically significant. This suggests that the liability standards could be an important mediating channel for corruption to affect the prevalence of concentrated ownership. However, the rightmost four regressions in Panel 1 of Table 11 indicate that the liability standards either is not (for mean ownership proportion) or at most a weak channel (for median ownership proportion) for corruption to determine the degree of ownership concentration.

We next turn to financial system orientation. Panel 2 of Table 11 presents regressions where the liability standards index turns out to be consistently statistically significant and positive. In contrast, the positive impact of corruption on a more market-oriented financial system weakens. When we use the ratio of stock market capitalization to bank assets as the dependent variable, the statistical significance of the corruption index diminishes compared with regressions in Table 4. The liability index takes away the statistical significance of the corruption index in regressions where the ratio of stock market trading value to bank credit serves as the dependent variable. If we choose the aggregate financial structure index as the dependent variable, the corruption

index shows the same statistical significance as in Table 5, but its magnitude diminishes to a large extent. These results suggest that the liability standards index works as a major channel in mediating the effects of corruption on financial system orientation.

3. Corruption, Accounting Standards and Financial System Structure

Transparency in corporate information disclosure is another major aspect of corporate governance and capital market regulation that we suggest may serve as a major mediating channel for corruption to affect financial system structure. Corrupt government officials may collude with corporate insiders to lower accounting and auditing standards or even to obstruct moves toward improving transparency in corporate information disclosure in order to cover up both bribe taking and managerial expropriation.

In a business environment where it is impossible or very costly for outside investors to have access to the truthful corporate information, being a minority shareholder is simply unappealing. The low participation rate of minority shareholders may lead to a high prevalence and degree of ownership concentration. Dispersed outside investors may opt to be bank depositors because bank run threat and deposit insurance will offer more safety to outside small investors. This makes a bank-oriented financial system more likely to prevail under corrupt governments.

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 12, we present regression results derived after controlling for the accounting standards index. In Panel 1, we take a look at the prevalence and degree of ownership concentration. The regressions show that the corruption index is consistently statistically significant. The accounting standards index is also mostly significant except in regressions for the prevalence of widely-held corporations using the 10% criterion. More importantly, when significant, the estimated coefficients of the accounting standards index are usually more statistically significant than those of the corruption index. Compared with the corresponding regressions in Tables 2-3 without controlling for the accounting standards index, the magnitude of the estimated coefficients of the corruption index also drops to a fairly large extent. This suggests that the accounting standards index serves as one major channel mediating the effects of corruption on corporate ownership pattern.

In terms of financial system orientation, the regressions in Panel 2 of Table 12 show that higher accounting standards contribute to a market-oriented financial system, whose effect is consistently statistically significant. Compared with regressions with similar specifications but without controlling for the accounting standards index as shown in Tables 4 and 5, the statistical

significance of the estimated coefficients of the corruption index diminishes or disappears after the introduction of transparency in corporate information disclosure. For example, when we use the aggregate financial structure index as the dependent variable, the statistical significance of the corruption index drops from the 1% level in the rightmost column of Table 5 to the 15% level in the rightmost column of Table 11 Panel 2; the magnitude of the estimated coefficient also diminishes dramatically from 0.096 to 0.037. This suggests that accounting standards are one major channel through which corruption shapes the financial system orientation.

0.3.8 Some Robustness Tests

In our regression analysis, the measures of the prevalence of widely-held companies based on the 10% and 20% criteria have a few countries with zero values. Would it cause any bias in OLS estimations? To address this potential concern, we re-estimate the equations using a Tobit model. In unreported results, we obtain qualitatively equivalent results as those from the OLS regressions. This further confirms our earlier results.

One other possible concern with the strong association between corruption and financial system structure may be simply driven by some extremely corrupt countries that are financially underdeveloped. To deal with this issue, we examine whether the relationship between corruption and financial system structure remains intact within the subsample of financially developed countries. We first follow the methodology of Demirguc-Kunt and Levine (1999) by classifying a country as financially developed if it has above median values of both bank and market development, where 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 unreported results, we find that a higher degree of corruption consistently and statistically significantly contributes to the proportion and the degree of concentrated ownership and a bank-oriented financial system even among financially developed economies. Moreover, to capture the potentially particularly large impact of corruption on equity market development, we run regressions within the subsample of countries with above median ratio of stock market capitalization to GDP (developed equity markets) and obtain qualitatively equivalent results. This helps us conclude that our results are not driven by some highly corrupt countries with no actively traded stock markets.

Some people may be tempted to suggest that the correlation between corruption and financial system structure may also be related to government interventionism. It is often argued that decision making in banks (block-shareholder-controlled companies) is more centralized than that in shareholding companies (widely-held companies). Bankers usually make decisions

on lending policies on behalf of the bank 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 than to deal with widely-held companies where minority shareholders may sell off their shareholdings when they disgree with the business strategy adopted. Hence government intervention may promote bank-oriented financial systems and concentrated ownership. As corrupt governments usually impose over-regulation on the economy, we try to see whether corruption casts independent impact on financial system structure. In unreported results, we include a government intervention index in regressions that synthesizes government intervention in terms of government subsidy and transfer, government enterprises, and top marginal tax rate and is constructed by the Economic Freedom of the World. It turns out that the corruption index remains statistically significant and the results described in this study remain qualitatively equivalent.

0.4 Conclusion

This research shows that corruption serves as a significant driving force for the diverse pattern of financial systems around the world. We argue that firm management under a corrupt government is particularly powerful in expropriating outside investors due to weaker corporate governance under a more corrupt government. Corporate ownership concentration and a bank-oriented financial system are different means of constraining managerial expropriation and protecting outside investors under corrupt governments.

Examining the impact of government efficiency and quality on financial systems adds to our understanding of the causes for the large variation in financial system structure across countries. It tells us that corporate ownership structure and financial system orientation are fundamentally shaped by the institutional quality in a country.

Our study demonstrates that small equity investors are particularly vulnerable to managerial expropriation, and this is especially severe under corrupt governments. The development of capital markets, especially corporate finance modes that involve a large number of small equity investors, such as dispersed equity financing and a market-based financial system, requires the support of strong institutions and efficient governments.

Model Appendix

Proof of Lemma 1

From the constraint, we know that ϕ must satisfy the condition of $\phi \leq 1 - \frac{2I}{Y_1(I)+Y_2(I)} \equiv \bar{\phi}$. Since $Y_2(I) > Y_1(I) \geq I$, we have $0 < \bar{\phi} < 1$. Taking the first order derivative of the objective function with respect to ϕ, we have $F_1 \equiv \frac{\partial B}{\partial \phi} - \frac{\partial c}{\partial \phi}$.

By assumption 4, when k approaches 0, $F_1 > 0$, and the managerial expropriation ϕ^{DE} will take the largest feasible value $\bar{\phi}$. When k approaches $\bar{k}$, $F_1 < 0$, and the managerial expropriation ϕ^{DE} will be zero.

When k is in the intermediate range, ϕ will have an interior solution, and is determined by the first order condition of $F_1 \equiv \frac{\partial B}{\partial \phi} - \frac{\partial c}{\partial \phi} = 0$. Using the implicit function theorem, we can obtain that $\frac{\partial \phi^{DE}}{\partial k} = -\frac{\frac{\partial F}{\partial k}}{\frac{\partial F}{\partial \phi}} = \frac{\frac{\partial^2 c}{\partial \phi \partial k}}{\frac{\partial^2 B}{\partial \phi^2} - \frac{\partial^2 c}{\partial \phi^2}} \leq 0$. QED.

Proof of Proposition 1

The optimal level of investment is determined by the first order condition with respect to I, i.e., $Y_2'(I) - \frac{1}{2}(Y_2'(I) - Y_1'(I)) - \frac{1}{2}\phi^{DE}(Y_1'(I) + Y_2'(I)) - 1 = 0$, which can be rewritten as $\frac{1}{2}(1 - \phi^{DE})(Y_1'(I) + Y_2'(I)) = 1$. As ϕ^{DE} is decreasing in k, $\frac{1}{2}(1 - \phi^{DE})(Y_1'(I) + Y_2'(I))$ is increasing in k. Because $\frac{1}{2}(1 - \phi^{DE})(Y_1'(I) + Y_2'(I)) \geq 0$ and $\frac{1}{2}(1 - \phi^{DE})(Y_1''(I) + Y_2''(I)) \leq 0$, a higher k corresponds to a higher level of investment. QED.

Proof of Proposition 2

When k lies in the intermediate region, we know that $0 < \phi < \bar{\phi}$ is satisfied.

Taking first order derivative of the objective function with respect to ϕ, we have the first order condition

$F_2 \equiv \frac{\partial B}{\partial \phi} - \alpha - \frac{\partial c}{\partial \phi} = 0$.

For a given k, in the case of dispersed equity financing ($\alpha = 0$), the expropriation (ϕ^{DE}) is determined by $F_1 \equiv \frac{\partial B}{\partial \phi} - \frac{\partial c}{\partial \phi} = 0$, while in concentrated equity financing, the expropriation (ϕ^{CE}) is determined by $F_2 \equiv \frac{\partial B}{\partial \phi} - \alpha - \frac{\partial c}{\partial \phi} = 0$. Because B is concave in ϕ and c is convex in ϕ, we know that $\phi^{CE} < \phi^{DE}$.

Suppose that we start with dispersed equity financing under a high k. The expropriation is determined by $F_1 \equiv \frac{\partial B}{\partial \phi} - \frac{\partial c}{\partial \phi} = 0$. When corruption worsens (k lowers), $\frac{\partial c}{\partial \phi}$ will decrease, and ϕ tends to increase because we will have $F_1 > 0$. To keep the expropriation unchanged when k goes down (corruption worsens), we may switch to the regime of concentrated equity financing because we know from $F_2 \equiv \frac{\partial B}{\partial \phi} - \alpha - \frac{\partial c}{\partial \phi} = 0$ that if the magnitude of $\frac{\partial^2 c}{\partial \phi \partial k}$ is sufficiently small,

a sufficiently high α can counter the decrease in $\frac{\partial c}{\partial \phi}$ and maintain $F_2 = 0$. Thus concentrated equity financing can be a way to prevent the worsening of expropriation of outside investors in the case of worsening corruption. This also implies that when k decreases, the expropriation of outside investors in concentrated equity financing is less severe than that in dispersed equity financing. Furthermore, under a more corrupt government (lower k and $\frac{\partial c}{\partial \phi}$), a higher α is required to maintain the equality of $F_2 = 0$. Hence, a more corrupt government corresponds to a higher α on average. QED.

Proof of Proposition 3

The objective function can be rewritten as

$\frac{1}{2}(1 - \phi^{CE})(Y_1(I) + Y_2(I)) - I$

The first order condition is thus $F_3 = \frac{1}{2}(1 - \phi^{CE})(Y_1'(I) + Y_2'(I)) - 1 = 0$. Compared with the case of dispersed equity financing where the optimal level of investment is determined by $\frac{1}{2}(1 - \phi^{DE})(Y_1'(I) + Y_2'(I)) = 1$, we see that $I^{CE} > I^{DE}$ because $\phi^{CE} < \phi^{DE}$, $Y_1'(I) + Y_2'(I) \geq 0$ and $Y_1''(I) + Y_2''(I) \leq 0$. QED.

Proof of Proposition 4

Because $Y_1(I) \geq I$ and $Y_2(I) \geq I$, the constraint of $\frac{1}{2}(Y_1(I) + Y_2(I)) \geq I$ is automatically satisfied.

The first order condition for program (5) is $\frac{1}{2}Y_1'(I) + \frac{1}{2}Y_2'(I) = 1$, from which the optimal investment of bank financing (I^{BF}) is determined. Since concentrated equity financing raises a larger amount of funds than dispersed equity financing, we only need to compare the amount of funds raised in bank financing with that in concentrated equity financing (I^{CE}). The first order condition in the case of concentrated equity financing is $\frac{1}{2}(1 - \phi^{CE})(Y_1'(I) + Y_2'(I)) = 1$. Because $Y_1'(I) + Y_2'(I) \geq 0$ and $Y_1''(I) + Y_2''(I) \leq 0$, we know that $I^{BF} > I^{CE}$ holds.

In program (4), we know that $\frac{\partial \phi^{CE}}{\partial k} = -\frac{\partial F_3/\partial k}{\partial F/\partial \phi} = -\frac{-c''}{B''-c''} \leq 0$. Under a more corrupt government with a lower value of k, ϕ^{CE} will be larger, and the difference between I^{BF} and I^{CE} will be larger. QED.

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Data Appendix

Proportion of widely-held corporations: percentage of large firms that are widely held, using either the 10% or the 20% definition of control, from La Porta et al (1999), complemented by own collection from Worldscope dataset. See Table 1 for the data.

Mean and median proportion of shares owned by large shareholders: the average percentage of common shares owned by the three largest shareholders in the 10 largest nonfinancial, privately owned domestic firms in a given country. The data on mean ownership concentration are from La Porta et al (2004), while the data on median ownership concentration are from La Porta et al (1998).

Corruption index: the average of the corruption index constructed by the Transparency International (TI) and the corruption index constructed by the International Country Risk Guide (ICRG). The TI index is average over 1995-98, and the ICRG index is average over 1985, 90, and 95. Available from Transparency International website www.transparency.org.

Classification of bank vs. market-based financial system (dummy variable whose value equal one if a bank-based financial system and zero if a market-based financial system): constructed by Demirguc-Kunt and Levine (1999).

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), averaging over the period of 1988-1997. Data on 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.

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), averaging over the period of 1988-99, 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. Available from World Bank Financial Structure database website at 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.

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

Explicit deposit insurance: dummy variable equal 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.

GNP: the GNP at 1995 constant US$, average over the period of 1970 and 1985, from World Development Indicators CD-ROM.

GNP per capita: GNP per capita in 1995 constant US$, average over the period of 1970 and 1985, from World Development Indicators CD-ROM.

Population: total population, average over 1970-85, from World Development Indicators CD-ROM.

Gini coefficient: average of the data from Barro-Lee dataset and those from *World Development Report* (1998/99 issue).

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.

Liability standards index: Index of the procedural difficulty in recovering losses from the Issuer and its directors in a civil liability case for losses due to misleading statements in the prospectus. The data are from La Porta et al (2004).

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 or 90 items. A higher score indicates a higher level of accounting standards observed. The data are available from La Porta et al (1998).

Table 1 Data Summary

Summary Statistics

	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Corruption Index	82	4.34	1.83	1.25	7.82
Proportion of Widely-held Companies (10% cutoff)	41	0.17	0.23	0	0.90
Proportion of Widely-held Companies (20% cutoff)	41	0.28	0.27	0	1.00
Mean Ownership Share of the Largest Shareholders	49	0.47	0.14	0.18	0.78
Median Ownership Share of the Largest Shareholders	45	0.45	0.16	0.12	0.68
Stock Market Capitalization/Deposit Money Bank Assets	81	0.66	0.68	0.0043	3.81
Stock Market Value Traded/Domestic Bank Credit	82	0.28	0.35	0.00025	1.69
Aggregate Financial Structure Index	66	0.014	0.38	-0.26	2.58
Gini Coefficient	52	37.25	9.60	19.5	59.25
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
Liability Standards Index	49	0.47	0.25	0	1
Accounting Standards Index	40	60.95	13.57	24	83

Pairwise Correlation of Selected Variables

	Corrupt Index	Widely Held Comp'y (20% criterion)	Mean Large Share-holding	Stock Cap/ Bank Assets	Stock Value Traded/ Bank Credit	Aggr. Financial Structure Index	Anti-director Rights Index	Anti-director Rights Index - Creditor Rights Index	Acc'ting Standard Index
Widely Held Companies (20% threshold)	0.51								
Mean Large Shareholding	-0.46	-0.77							
Stock Capitali-zation / Bank Assets	0.27	0.13	-0.25						
Stock Value Traded / Bank Credit	0.38	0.17	-0.47	0.64					
Aggregate Financial Structure Index	0.30	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	0.61	0.52	-0.58	0.48	0.54	0.53	0.35	0.12	
Liability Standard Index	0.29	0.32	-0.42	0.37	0.40	0.40	0.49	0.36	0.41

Countries with data on both corruption index and financial structure measures (stock market capitalization of listed companies/deposit money bank assets and stock market value traded/domestic bank credit)

Argentina, Australia, Austria, Bangladesh, Belgium, Bolivia, Botswana, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Cote d'Ivoire, Cyprus, Czech, Denmark, Ecuador, Egypt, Finland, France, Germany, Ghana, Greece, Guatemala, El Salvador *, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Korea, Latvia, Luxembourg, Malaysia, Mauritius, Mexico, Mongolia, Morocco, Namibia, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russia, Saudi Arabia, Singapore, Slovakia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Trinidad and Tobago, Tunisia, Turkey, United Kingdom, United States, Uruguay, Venezuela, Zambia, Zimbabwe.

*: only available for stock market value traded/domestic bank credit.

Countries with data on both corruption index and aggregate financial structure index

Argentina, Australia, Austria, Bangladesh, Belgium, Bolivia, Botswana, Brazil, Canada, Chile, Colombia, Costa Rica, Cote d'Ivoire, Cyprus, Denmark, Ecuador, Egypt, Finland, France, Germany, Ghana, Greece, Honduras, Hong Kong, India, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Korea, Luxembourg, Malaysia, Mauritius, Mexico, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Saudi Arabia, Singapore, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Trinidad and Tobago, Tunisia, Turkey, United Kingdom, United States, Uruguay, Venezuela, Zimbabwe.

Countries with data on both corruption index and the proportion of widely-held companies

Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Peru, Philippines, Poland, Portugal, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Kingdom, United States.

Countries with data on both corruption index and the mean and median ownership share of largest shareholders

Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Kingdom, United States, Venezuela, Zimbabwe.
Note: the mean ownership data include four more countries: Ecuador, Jordan, Kenya, and Uruguay.

Data on Ownership Concentration

A: Proportion of widely-held companies based on the 10% criterion; B: Proportion of widely-held companies based on the 20% criterion; C: Mean ownership of large shareholders; D: Median ownership of large shareholders.

Country	A	B	C	D	Country	A	B	C	D
Argentina	0	0	0.53	0.55	Korea, Rep.	0.4	0.55	0.23	0.2
Australia	0.55	0.65	0.28	0.28	Malaysia	0	0.15	0.54	0.52
Austria	0.05	0.05	0.58	0.51	Mexico	0	0	0.64	0.67
Belgium	0	0.05	0.54	0.62	Netherlands	0.3	0.3	0.39	0.31
Brazil	0	0	0.57	0.63	New Zealand	0.05	0.3	0.48	0.51
Canada	0.5	0.6	0.4	0.24	Nigeria			0.4	0.45
Chile	0	0.0526	0.45	0.38	Norway	0.05	0.25	0.36	0.31
China	0.0833	0.0833			Pakistan			0.37	0.41
Colombia			0.629	0.68	Peru	0	0	0.56	0.57
Denmark	0.1	0.4	0.45	0.4	Philippines	0	0.25	0.57	0.51
Ecuador			0.543		Poland	0.1	0.25		
Egypt			0.62	0.62	Portugal	0	0.1	0.52	0.59
Finland	0.15	0.35	0.37	0.34	Singapore	0.05	0.15	0.49	0.53
France	0.3	0.6	0.34	0.24	South Africa	0	0.3	0.52	0.52
Germany	0.35	0.5	0.48	0.5	Spain	0.15	0.35	0.51	0.5
Greece	0.05	0.1	0.67	0.68	Sri Lanka			0.6	0.61
Hong Kong	0.1	0.1	0.54	0.54	Sweden	0	0.25	0.28	0.28
Hungary	0	0.1111			Switzerland	0.5	0.6	0.41	0.48
India	0.1	0.15	0.4	0.43	Taiwan	0	0.25	0.18	0.14
Indonesia	0	0.05	0.58	0.62	Thailand	0	0.05	0.47	0.48
Ireland	0.45	0.65	0.39	0.36	Turkey	0	0	0.59	0.58
Israel	0.05	0.05	0.51	0.55	United Kingdom	0.9	1	0.19	0.15
Italy	0.15	0.2	0.58	0.6	United States	0.8	0.8	0.2	0.12
Japan	0.5	0.9	0.18	0.13	Uruguay			0.7788	
Jordan			0.5222		Venezuela, RB			0.51	0.49
Kenya			0.6697		Zimbabwe			0.55	0.51

Table 2 Corruption and the Prevalence of Widely-held Corporations

The OLS regression estimated is $Y = \alpha + \beta_1 \, Corruption\ Index + \beta_2 X + \varepsilon$, where Y, the dependent variable, is the proportion of widely-held companies based on the 10% criterion (A) or the 20% criterion (B). X is a set of control variables and α is a constant term. A higher value of the dependent variable indicates a higher prevalence of widely-held companies without concentrated ownership. The major independent variable is the corruption index, which is the average of the TI and ICRG corruption indices. Control variables include the logarithm of population, the logarithm of GDP per capita, and the Gini coefficient. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. Robust standard errors are in the parentheses. See data appendix for detailed variable definition and sources.

	A	A	A	B	B	B
Corruption Index	0.058 [a]	0.074 [b]	0.070 [b]	0.079 [a]	0.093 [a]	0.085 [b]
	(0.018)	(0.028)	(0.030)	(0.017)	(0.033)	(0.036)
Log of Population		0.12 [a]	0.12 [a]		0.13 [a]	0.12 [a]
		(0.026)	(0.027)		(0.028)	(0.029)
Log of GDP per Capita		0.072 [a]	0.075 [b]		0.080 [b]	0.087 [b]
		(0.027)	(0.028)		(0.038)	(0.040)
Gini Coefficient			-0.000066			-0.00012
			(0.0028)			(0.0033)
Constant Term	-0.15 [c]	-2.91 [a]	-2.91 [a]	-0.14 [d]	-3.07 [a]	-3.05 [a]
	(0.074)	(0.56)	(0.61)	(0.083)	(0.62)	(0.67)
Number of Observations	41	41	39	41	41	39
Adjusted R^2	0.16	0.50	0.48	0.24	0.52	0.50

Table 3 Corruption and the Ownership Share of Large Shareholders

The OLS regression estimated is $Y = \alpha + \beta_1 \, Corruption\ Index + \beta_2 X + \varepsilon$, where Y, the dependent variable, is the mean proportion of shares owned by large shareholders (A) or the median proportion of shares owned by large shareholders (B). X is a set of control variables and α is a constant term. A higher value of the dependent variable indicates a higher degree of ownership concentration. The major independent variable is the corruption index, which is the average of the TI and ICRG corruption indices. Control variables include the logarithm of population, the logarithm of GDP per capita, and the Gini coefficient. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. Robust standard errors are in the parentheses. See data appendix for detailed variable definition and sources.

	A	A	A	B	B	B
Corruption Index	-0.034 [a]	-0.068 [a]	-0.062 [a]	-0.038 [a]	-0.084 [a]	-0.080 [a]
	(0.0083)	(0.016)	(0.020)	(0.0092)	(0.021)	(0.025)
Log of Population		-0.058 [a]	-0.052 [a]		-0.070 [a]	-0.068 [a]
		(0.013)	(0.015)		(0.019)	(0.020)
Log of GDP per Capita		0.024	0.026		0.028	0.029
		(0.019)	(0.023)		(0.025)	(0.028)
Gini Coefficient			0.0019			0.0015
			(0.0017)			(0.0021)
Constant Term	0.64 [a]	1.59 [a]	1.35 [a]	0.64 [a]	1.82 [a]	1.70 [a]
	(0.046)	(0.26)	(0.32)	(0.049)	(0.37)	(0.43)
Number of Observations	49	49	44	45	45	43
Adjusted R^2	0.14	0.46	0.40	0.19	0.45	0.42

Table 4 Corruption and the Bank-based vs. Market-based Financial System (OLS Regressions)

The OLS regression estimated is $Y = \alpha + \beta_1 \, Corruption\ Index + \beta_2 X + \varepsilon$, 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 α is a constant term. A higher value of the dependent variable indicates a more market-oriented financial system. The major independent variable is the corruption index, which is the average of the TI and ICRG corruption indices. 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. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. Robust standard errors are in the parentheses. See data appendix for detailed variable definition and sources.

Corruption Index	0.17 [a]	0.26 [b]	0.36 [b]	0.39 [a]
	(0.058)	(0.11)	(0.14)	(0.14)
Log of Population		0.11 [d]	0.20 [c]	0.33 [b]
		(0.074)	(0.12)	(0.13)
Log of GDP per capita		-0.090	-0.39 [a]	-0.34 [b]
		(0.14)	(0.13)	(0.13)
Dividends Tax Disadvantage			-0.31	-0.35
			(0.38)	(0.38)
Capital Gain Tax Disadvantage			-0.21	-0.24
			(0.40)	(0.41)
Explicit Deposit Insurance Dummy				-0.52 [c]
				(0.29)
Constant term	-1.64 [a]	-3.08 [b]	-2.22	-4.76 [b]
	(0.31)	(1.31)	(1.90)	(2.30)
Number of Observations	81	81	46	43
Adjusted R-squared	0.059	0.070	0.11	0.17

Table 5 Corruption and the Bank-based vs. Market-based Financial System

The OLS regression estimated is $Y = \alpha + \beta_1$ *Corruption Index* $+ \beta_2 X + \varepsilon$, where Y, the dependent variable, is the logarithm of the ratio of stock market value traded to domestic bank credit (A) or the aggregate financial structure index (B), X is a set of control variables and α is a constant term. A higher value of both dependent variables indicates a more market-oriented financial system. The major independent variable is the corruption index, which is the average of the TI and ICRG corruption indices. 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. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. Robust standard errors are in the parentheses. See data appendix for detailed variable definition and sources.

Dependent Variable	A	A	A	B	B	B
Corruption Index	0.36 [a]	0.34 [a]	0.42 [c]	0.059 [b]	0.064 [b]	0.096 [a]
	(0.091)	(0.12)	(0.23)	(0.032)	(0.033)	(0.022)
Log of Population		0.55 [a]	0.61 [b]		-0.036	0.073 [a]
		(0.087)	(0.24)		(0.052)	(0.019)
Log of GDP per capita		0.24 [c]	0.059		-0.016	-0.051 [c]
		(0.14)	(0.22)		(0.040)	(0.026)
Dividends Tax Disadvantage			-0.73			-0.12 [d]
			(0.71)			(0.074)
Capital Gain Tax Disadvantage			-0.22			-0.078
			(0.45)			(0.070)
Explicit Deposit Insurance Dummy			-0.60 [d]			-0.17 [a]
			(0.38)			(0.056)
Constant term	-3.77 [a]	-14.55 [a]	-13.85 [a]	-0.25 [b]	0.44	-1.20 [a]
	(0.13)	(1.88)	(4.35)	(0.11)	(0.80)	(0.39)
Number of Observations	82	82	43	66	66	43
Adjusted R-squared	0.13	0.36	0.22	0.075	0.075	0.26

Table 6 Corruption, Corporate Ownership Concentration and Financial System Structure (IV Regressions)

The regression estimated is $Y = \alpha + \beta_1 \, Corruption\ Index + \beta_2 X + \varepsilon$, where Y, the dependent variable, includes the proportion of widely-held companies based on the 10% criterion (A), the proportion of widely-held companies based on the 20% criterion (B), the mean ownership share of large shareholders (C), and the median ownership share of large shareholders (D) in Panel 1, and the logarithm of the ratio of stock market capitalization of listed companies to deposit money bank assets (E), the logarithm of the ratio of stock market value traded to domestic bank credit (F) and the aggregate financial structure index (G) in Panel 2. X is a set of control variables and α is a constant term. A higher value of the dependent variables A and B suggests a more prevalent pattern of widely-held corporations; a higher value of the dependent variables C and D indicates a higher degree of ownership concentration; a higher value of the dependent variables E, F and G shows a more market-oriented financial system. The regressions are estimated by two stage least squares method. The endogenous independent variable is the corruption index, which is the average of the TI and ICRG corruption indexes. We choose religious compositions, i.e., the proportion of population who are Protestant, Catholic, and Muslim as instrumental variables. Exogenous control variables include the logarithm of population, the logarithm of GDP per capita, the Gini coefficient, the dividend tax disadvantage, the capital gain tax disadvantage, and the explicit deposit insurance dummy. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. Robust standard errors are in the parentheses. See data appendix for detailed variable definition and sources.

Panel 1: Corruption and Ownership Concentration

Dependent Variable	A	B	C	D
Corruption Index	0.087 [b]	0.19 [a]	-0.088 [a]	-0.11 [a]
	(0.040)	(0.068)	(0.026)	(0.033)
Log of Population	0.046 [d]	0.086 [d]	-0.061 [a]	-0.078 [a]
	(0.028)	(0.057)	(0.018)	(0.025)
Log of GDP per Capita	-0.041	-0.098	0.051 [c]	0.055 [d]
	(0.038)	(0.077)	(0.027)	(0.034)
Gini Coefficient	-0.00033	0.0017	0.0011	0.00075
	(0.0015)	(0.0023)	(0.0018)	(0.0022)
Constant Term	-0.79	-1.47	1.45 [a]	1.82 [a]
	(0.66)	(1.30)	(0.35)	(0.46)
Number of Observations	39	39	44	43
First-stage Adjusted-R^2	0.84	0.84	0.82	0.82

p-value of First-stage F-test	0.00	0.00	0.00	0.00
p-value of Over-identifying Restriction Test	0.50	0.14	0.70	0.89
p-value of Hausman Test	0.97	0.59	0.96	0.95

Panel 2: Corruption and Bank-oriented vs. Market-oriented Financial Systems

Dependent Variable	E	E	F	F	G	G
Corruption Index	0.33 [c]	0.37 [c]	0.40 [c]	0.40 [d]	0.068 [d]	0.072 [c]
	(0.20)	(0.19)	(0.24)	(0.24)	(0.045)	(0.041)
Log of Population	0.13 [c]	0.28 [c]	0.51 [a]	0.57 [b]	0.017	0.058 [b]
	(0.075)	(0.15)	(0.092)	(0.23)	(0.012)	(0.026)
Log of GDP per Capita	-0.21	-0.36 [b]	0.14	0.058	-0.050	-0.032
	(0.24)	(0.18)	(0.25)	(0.27)	(0.054)	(0.042)
Dividend Tax Disadvantage		-0.26		-0.64		-0.10 [d]
		(0.38)		(0.66)		(0.074)
Capital Gain Tax Disadvantage		-0.24		-0.23		-0.081
		(0.42)		(0.46)		(0.070)
Explicit Deposit Insurance Dummy		-0.55 [c]		-0.64 [d]		-0.17 [a]
		(0.29)		(0.39)		(0.057)
Constant Term	-2.85 [a]	-3.72 [d]	-13.43 [a]	-13.09 [a]	-0.21	-1.00 [b]
	(1.49)	(2.52)	(1.90)	(4.17)	(0.29)	(0.43)
Number of Observations	79	44	79	44	64	44
First-stage Adjusted-R^2	0.54	0.84	0.54	0.84	0.54	0.84
p-value of First-stage F-test	0.00	0.00	0.00	0.00	0.00	0.00
p-value of Over-identifying Restriction Test	0.66	0.42	0.21	0.64	0.24	0.40
p-value of Hausman Test	0.62	0.95	0.21	0.98	0.58	0.52

Table 7 Corruption, Corporate Ownership Concentration and Financial System Structure (IV Regressions)

The regression estimated is $Y = \alpha + \beta_1 \, Corruption\ Index + \beta_2 X + \varepsilon$, where Y, the dependent variable, includes the logarithm of the ratio of stock market capitalization of listed companies to deposit money bank assets (A), the logarithm of the ratio of stock market value traded to domestic bank credit (B) and the aggregate financial structure index (C). X is a set of control variables and α is a constant term. A higher value of these dependent variables suggests a more market-oriented financial system. The regressions are estimated by two stage least squares method. The endogenous independent variable is the corruption index, which is the average of the TI and ICRG corruption indexes. We choose log of settler mortality as instrumental variable. Settler mortality is the annualized deaths per thousand European soldiers in European colonies in the early 19th century. 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. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. Robust standard errors are in the parentheses. See data appendix for detailed variable definition and sources.

Dependent Variable	A	A	B	B	C	C
Corruption Index	0.21 [c]	0.41	0.81 [a]	0.98 [d]	0.069 [c]	0.17 [b]
	(0.13)	(0.30)	(0.18)	(0.60)	(0.037)	(0.074)
Log of Population		0.38 [b]		0.99 [b]		0.091 [c]
		(0.28)		(0.41)		(0.044)
Log of GDP per Capita		-0.14		-0.11		-0.062
		(0.30)		(0.49)		(0.063)
Dividend Tax Disadvantage		-0.46		-1.26 [d]		-0.20 [b]
		(0.49)		(0.80)		(0.090)
Capital Gain Tax Disadvantage		0.17		0.69		0.095
		(0.73)		(0.88)		(0.081)
Explicit Deposit Insurance Dummy		-0.87		-1.69		-0.32 [d]
		(0.65)		(1.40)		(0.19)
Constant Term	-1.51 [a]	-7.23 [d]	-5.58 [a]	-21.16 [a]	-0.29 [c]	-1.66 [b]
	(0.52)	(4.51)	(0.75)	(6.50)	(0.15)	(0.76)
Number of Observations	38	22	38	22	37	22
First-stage Adjusted-R^2	0.47	0.79	0.47	0.79	0.47	0.79
p-value of First-stage F-test	0.0001	0.00	0.0001	0.00	0.0001	0.00
p-value of Hausman Test	0.043	0.72	0.033	0.061	0.97	0.93

Table 8 Explaining Corruption: First Stage Regression

Two regressions are conducted in this table. The first regression model estimated is *Corruption Index* = $\alpha + \beta_1$ *Proportion of Protestant* + β_2 *Proportion of Catholics* +β_3 *Proportion of Muslim* + ε, where α is a constant term and ε is error term. Corruption index is the average of the TI and ICRG corruption indices. The explanatory variables are the proportions of population who follow Protestant, Catholic, and Muslim religions respectively. This regression can be regarded as the benchmark first stage regression of corruption index on the instrumental variables of religious compositions without including other exogenous variables. The second regression model estimated is *Corruption Index* = $\alpha + \beta_1$ *Log of Settler Mortality* + ε. This regression can be treated as the benchmark first stage regression of corruption index on the instrumental variable of settler mortality without including other exogenous variables. Settler mortality is the annualized deaths per thousand European soldiers in European colonies in the early 19th century. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. Robust standard errors are in the parentheses. See data appendix for detailed variable definition and sources.

Proportion of Protestant	0.035 [a]	
	(0.0063)	
Proportion of Catholics	-0.00054	
	(0.0046)	
Proportion of Muslim	-0.0085 [b]	
	(0.0034)	
Log of Settler Mortality		-1.07 [a]
		(0.24)
Constant term	3.58 [a]	8.19 [a]
	(0.27)	(1.00)
Number of Observations	82	38
Adjusted R-squared	0.25	0.47

Table 9 Corruption and Financial System Orientation (Panel Data Analysis)

The regression estimated is $Y = \alpha + \beta_1$ *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 ε is the error term. A higher value of the dependent variable Y suggests a more market-oriented financial system. The major independent variable is the corruption index, which is the average of the TI and ICRG corruption indices. The control variables include the logarithm of population, the logarithm of GDP per capita, the dividend tax disadvantage, the capital gain tax disadvantage, and 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 1986-90, 1991-95 and 1996-97 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 regressions. The random-effects regressions incorporate all variables mentioned. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. 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 data appendix for detailed variable definition and sources.

Estimation Method	FE	FE	RE	RE	RE
Corruption Index	0.10 [c]	0.093 [c]	0.14 [a]	0.12 [b]	0.13 [b]
	(0.054)	(0.053)	(0.048)	(0.051)	(0.063)
Log of Population		1.61 [b]		0.16 [b]	0.23 [b]
		(0.70)		(0.081)	(0.12)
Log of GDP per Capita		0.044		0.12	0.036
		(0.32)		(0.090)	(0.11)
Dividend Tax Disadvantage				-0.12 [d]	-0.046
				(0.076)	(0.42)
Capital Gain Tax Disadvantage					-0.41
					(0.38)
Explicit Deposit Insurance Dummy					-0.49 [d]
					(0.30)
Number of Observations	198	198	198	198	127
Number of Countries	78	78	78	78	44
p-value of F-test of All Fixed Error=0	0.00	0.00			
p-value of Breusch and Pagan Lagragian Multiplier Test			0.00	0.00	0.00
R^2	0.52	0.57	0.51	0.55	0.51

Table 10 Corruption, Investor Rights, and Corporate Finance Pattern

The regression estimated is $Y = \alpha + \beta_1$ *Corruption Index* $+ \beta_2$ *Investor Rights Index* $+ \beta_3 X + \varepsilon$, where Y, the dependent variable, includes the proportion of widely-held companies based on the 10% criterion (A), the proportion of widely-held companies based on the 20% criterion (B), the mean ownership share of large shareholders (C), and the median ownership share of large shareholders (D) in Panel 1, and the logarithm of the ratio of stock market capitalization of listed companies to deposit money bank assets (E), the logarithm of the ratio of stock market value traded to domestic bank credit (F) and the aggregate financial structure index (G) in Panel 2. A higher value of the dependent variables A and B suggests a more prevalent pattern of widely-held corporations; a higher value of the dependent variables C and D indicates a higher degree of ownership concentration; a higher value of the dependent variables E, F and G shows a more market-oriented financial system. The major independent variables are the corruption index and the investor rights index. Investor rights index is the antidirector rights index in Panel 1 and the difference between the antidirector rights index and the creditor rights index in Panel 2. X is a set of control variables and α 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 Gini coefficient, the dividend tax disadvantage, the capital gain tax disadvantage, and the explicit deposit insurance dummy. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. Robust standard errors are in the parentheses. See data appendix for detailed variable definition and sources.

Panel 1: Corruption, Investor Rights and Corporate Ownership Concentration

Dependent Variable	A	A	B	B	C	C	D	D
Corruption Index	0.056 [c]	0.025	0.073 [c]	0.028	-0.056 [a]	-0.044[c]	-0.072[a]	-0.053[c]
	(0.031)	(0.040)	(0.039)	(0.044)	(0.015)	(0.023)	(0.021)	(0.029)
Antidirector Rights Index	0.040 [b]	0.056 [b]	0.051 [b]	0.073 [a]	-0.012	-0.019[d]	-0.021[d]	-0.031[b]
	(0.019)	(0.024)	(0.022)	(0.026)	(0.011)	(0.012)	(0.013)	(0.014)
Log of Population	0.12 [a]	0.11 [a]	0.13 [a]	0.11 [a]	-0.053 [a]	-0.047[a]	-0.072[a]	-0.063[a]
	(0.026)	(0.026)	(0.029)	(0.031)	(0.012)	(0.015)	(0.018)	(0.020)
Log of GDP per Capita	0.089 [b]	0.11 [b]	0.098 [b]	0.13 [a]	0.0096	0.0076	0.010	-0.0011
	(0.033)	(0.042)	(0.045)	(0.047)	(0.018)	(0.026)	(0.024)	(0.032)
Gini Coefficient		-0.0031		-0.0036		0.0027[d]		0.0028
		(0.0040)		(.0044)		(.0017)		(.0021)
Constant Term	-3.11 [a]	-2.86 [a]	-3.35 [a]	-3.06 [a]	1.59 [a]	1.37 [a]	2.00 [a]	1.77 [a]
	(0.51)	(0.57)	(0.56)	(0.66)	(0.24)	(0.29)	(0.31)	(0.34)
Number of	37	36	37	36	46	43	43	42

Observations								
Adjusted R-squared	0.53	0.53	0.57	0.58	0.46	0.46	0.51	0.52

Panel 2: Corruption, Investor Rights and Financial System Orientation

Dependent Variable	E	E	F	F	G	G
Corruption Index	0.22 [a]	0.32 [a]	0.17 [d]	0.26 [b]	0.062 [b]	0.093 [a]
	(0.082)	(0.076)	(0.10)	(0.13)	(0.025)	(0.022)
Antidirector Rights Index – Creditor Rights Index	0.17 [a]	0.22 [a]	0.11	0.14 [c]	0.021 [c]	0.036 [a]
	(0.047)	(0.046)	(0.073)	(0.075)	(0.011)	(0.011)
Log of Population	-0.011	0.21 [a]	0.20 [b]	0.38 [a]	0.0058	0.067 [a]
	(0.067)	(0.071)	(0.092)	(0.13)	(0.020)	(0.020)
Log of GDP per Capita	-0.38 [a]	-0.37 [a]	0.093	0.10	-0.057 [c]	-0.058 [b]
	(0.10)	(0.077)	(0.16)	(0.17)	(0.030)	(0.024)
Dividend Tax Disadvantage		-0.35		-0.58		-0.14 [c]
		(0.26)		(0.62)		(0.058)
Capital Gain Tax Disadvantage		-0.33		-0.14		-0.10 [c]
		(0.30)		(0.38)		(0.055)
Explicit Deposit Insurance Dummy		-0.75 [a]		-0.65 [b]		-0.22 [a]
		(0.19)		(0.29)		(0.050)
Constant Term	1.73	-2.28 [d]	-6.28 [a]	-9.73 [a]	0.059	-1.04 [b]
	(1.27)	(1.38)	(2.14)	(2.78)	(0.36)	(0.39)
Number of Observations	45	42	44	41	45	42
Adjusted R-squared	0.22	0.40	0.15	0.16	0.073	0.30

Table 11 Corruption, Liability Standard and Corporate Finance Pattern

The regression estimated is $Y = \alpha + \beta_1$ *Corruption Index* $+ \beta_2$ *Liability Standards Index* $+ \beta_3 X + \varepsilon$, where Y, the dependent variable, includes the proportion of widely-held companies based on the 10% criterion (A), the proportion of widely-held companies based on the 20% criterion (B), the mean ownership share of large shareholders (C), and the median ownership share of large shareholders (D) in Panel 1, and the logarithm of the ratio of stock market capitalization of listed companies to deposit money bank assets (E), the logarithm of the ratio of stock market value traded to domestic bank credit (F) and the aggregate financial structure index (G) in Panel 2. A higher value of the dependent variables A and B suggests a more prevalent pattern of widely-held corporations; a higher value of the dependent variables C and D indicates a higher degree of ownership concentration; a higher value of the dependent variables E, F and G shows a more market-oriented financial system. The major independent variables are the corruption index and the liability standards index. A higher value of the liability standards index indicates a less difficult legal procedure of recovering losses from the misbehavior of corporate managers. X is a set of control variables and α 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 Gini coefficient, the dividend tax disadvantage, the capital gain tax disadvantage, and the explicit deposit insurance dummy. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. Robust standard errors are in the parentheses. See data appendix for detailed variable definition and sources.

Panel 1: Corruption, Liability Standards, and Corporate Ownership Concentration

Dependent Variable	A	A	B	B	C	C	D	D
Corruption Index	0.084 [b] (0.033)	0.081[b] (0.036)	0.060 [c] (0.031)	0.060 [c] (0.034)	-0.060 [a] (0.020)	-0.054[b] (0.023)	-0.071[a] (0.025)	-0.067[b] (0.029)
Liability Standard Index	0.30 [a] (0.10)	0.29 [a] (0.10)	0.27 [a] (0.072)	0.27 [a] (0.073)	-0.063 (0.068)	-0.069 (0.069)	-0.12[d] (0.076)	-0.12 [d] (0.077)
Log of Population	0.13 [a] (0.030)	0.13 [a] (0.031)	0.12 [a] (0.025)	0.12 [a] (0.026)	-0.054 [a] (0.013)	-0.048[a] (0.015)	-0.064[a] (0.019)	-0.062[a] (0.020)
Log of GDP per Capita	0.087 [b] (0.040)	0.091 [b] (0.041)	0.085 [b] (0.032)	0.085 [b] (0.034)	0.018 (0.021)	0.020 (0.024)	0.017 (0.027)	0.019 (0.030)
Gini Coefficient		0.00045 (0.0035)		0.000028 (0.0033)		0.0020 (.0017)		0.0017 (.0021)
Constant Term	-3.35 [a] (0.62)	-3.38 [a] (0.71)	-3.13 [a] (0.50)	-3.13 [a] (0.55)	1.56 [a] (0.25)	1.33 [a] (0.31)	1.81 [a] (0.33)	1.67 [a] (0.38)
Number of Observations	37	36	37	36	48	44	44	43

Adjusted R-squared	0.59	0.57	0.57	0.55	0.46	0.40	0.46	0.44

Panel 2: Corruption, Liability Standards and Financial System Orientation

Dependent Variable	E	E	F	F	G	G
Corruption Index	0.21 [d]	0.25 [c]	0.16	0.21	0.049 [b]	0.063 [a]
	(0.13)	(0.14)	(0.20)	(0.21)	(0.021)	(0.018)
Liability Standard Index	0.92 [b]	1.14 [b]	1.24 [b]	1.64 [a]	0.20 [b]	0.28 [a]
	(0.45)	(0.50)	(0.52)	(0.55)	(0.085)	(0.085)
Log of Population	0.044	0.24 [c]	0.26 [d]	0.50 [b]	0.0027	0.055 [a]
	(0.10)	(0.12)	(0.17)	(0.22)	(0.018)	(0.017)
Log of GDP per Capita	-0.33 [b]	-0.26 [b]	0.12	0.23	-0.043 [c]	-0.025
	(0.13)	(0.12)	(0.22)	(0.21)	(0.025)	(0.021)
Dividend Tax Disadvantage		-0.48		-0.94		-0.16 [b]
		(0.39)		(0.71)		(0.074)
Capital Gain Tax Disadvantage		-0.16		-0.12		-0.060
		(0.38)		(0.41)		(0.061)
Explicit Deposit Insurance Dummy		-0.67 [a]		-0.81 [b]		-0.21 [a]
		(0.23)		(0.33)		(0.049)
Constant Term	0.11	-3.85 [c]	-8.16 [a]	-13.23 [a]	-0.021	-1.07 [a]
	(1.58)	(2.06)	(2.83)	(3.99)	(0.31)	(0.31)
Number of Observations	48	44	48	44	48	44
Adjusted R-squared	0.16	0.24	0.21	0.28	0.14	0.34

Table 12 Corruption, Accounting Standards, and Corporate Finance Pattern

The regression estimated is $Y = \alpha + \beta_1$ *Corruption Index* $+ \beta_2$ *Accounting Standards Index* $+ \beta_3 X + \varepsilon$, where Y, the dependent variable, includes the proportion of widely-held companies based on the 10% criterion (A), the proportion of widely-held companies based on the 20% criterion (B), the mean ownership share of large shareholders (C), and the median ownership share of large shareholders (D) in Panel 1, and the logarithm of the ratio of stock market capitalization of listed companies to deposit money bank assets (E), the logarithm of the ratio of stock market value traded to domestic bank credit (F) and the aggregate financial structure index (G) in Panel 2. A higher value of the dependent variables A and B suggests a more prevalent pattern of widely-held corporations; a higher value of the dependent variables C and D indicates a higher degree of ownership concentration; a higher value of the dependent variables E, F and G shows a more market-oriented financial system. The major independent variables are the corruption index 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 α 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 Gini coefficient, the dividend tax disadvantage, the capital gain tax disadvantage, and the explicit deposit insurance dummy. Superscripts of a, b, c and d indicate statistical significance at the 1%, 5%, 10%, and 15% levels respectively. Robust standard errors are in the parentheses. See data appendix for detailed variable definition and sources.

Panel 1: Corruption, Accounting Standards, and Corporate Ownership Concentration

Dependent Variable	A	A	B	B	C	C	D	D
Corruption Index	0.069 [b]	0.068 [c]	0.074 [b]	0.073 [c]	-0.050 [b]	-0.042[c]	-0.062[b]	-0.054[c]
	(0.030)	(0.033)	(0.037)	(0.040)	(0.019)	(0.025)	(0.025)	(0.031)
Accounting Standard Index	0.0032	0.0031	0.0068 [b]	0.0066[b]	-0.0029 [b]	-0.0030[b]	-0.0029[b]	-0.0032[b]
	(0.0026)	(0.0027)	(0.0030)	(0.0031)	(0.0012)	(0.0013)	(0.0014)	(0.0014)
Log of Population	0.14 [a]	0.14 [a]	0.15 [a]	0.15 [a]	-0.058 [a]	-0.053[a]	-0.070[a]	-0.067[a]
	(0.026)	(0.027)	(0.026)	(0.027)	(0.014)	(0.017)	(0.020)	(0.022)
Log of GDP per Capita	0.066 [b]	0.066 [c]	0.074 [c]	0.077 [c]	0.012	0.016	0.013	0.017
	(0.031)	(0.036)	(0.040)	(0.044)	(0.023)	(0.026)	(0.029)	(0.034)
Gini Coefficient		-0.00017		.00025		0.0024		0.0028
		(0.0041)		(.0044)		(.0020)		(.0028)
Constant Term	-3.35 [a]	-3.33 [a]	-3.69 [a]	-3.71 [a]	1.78 [a]	1.53 [a]	2.02 [a]	1.80 [a]
	(0.52)	(0.64)	(0.53)	(0.70)	(0.31)	(0.38)	(0.42)	(0.48)
Number of	35	34	35	34	40	38	39	38

Observations								
Adjusted R-squared	0.57	0.54	0.64	0.61	0.53	0.46	0.46	0.46

Panel 2: Corruption, Accounting Standards, and Financial System Orientation

Dependent Variable	E	E	F	F	G	G
Corruption Index	0.25 [c]	0.34 [c]	0.018	0.14	0.019	0.037 [d]
	(0.13)	(0.14)	(0.15)	(0.19)	(0.023)	(0.023)
Accounting Standard Index	0.044 [a]	0.042 [a]	0.048 [b]	0.036 [c]	0.0090 [a]	0.0078 [a]
	(0.010)	(0.012)	(0.018)	(0.021)	(0.0024)	(0.0026)
Log of Population	-0.0070	0.12	0.19	0.38 [c]	-0.0051	0.037 [d]
	(0.10)	(0.11)	(0.16)	(0.22)	(0.023)	(0.023)
Log of GDP per Capita	-0.40 [b]	-0.34 [b]	0.00086	0.011	-0.065 [d]	-0.046
	(0.17)	(0.15)	(0.26)	(0.23)	(0.040)	(0.036)
Dividend Tax Disadvantage		-0.0054		-1.37		-0.10
		(0.61)		(1.09)		(0.12)
Capital Gain Tax Disadvantage		-0.18		-0.14		-0.074
		(0.34)		(0.48)		(0.053)
Explicit Deposit Insurance Dummy		-0.48 [b]		-0.59 [c]		-0.17 [a]
		(0.21)		(0.32)		(0.045)
Constant Term	0.24	-2.37	-7.55 [c]	-10.23 [b]	0.011	-0.81 [d]
	(2.17)	(2.47)	(3.85)	(4.74)	(0.47)	(0.52)
Number of Observations	40	39	40	39	40	39
Adjusted R-squared	0.40	0.41	0.25	0.26	0.32	0.41

Figures: Corruption and Corporate Finance Pattern

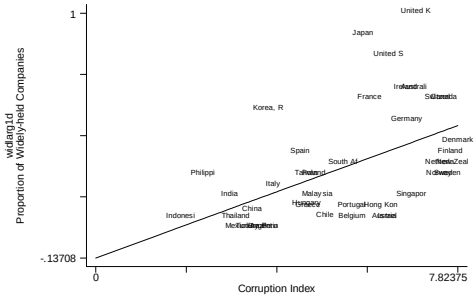

Figure 1 Proportion of Widely-held Companies vs. Corruption Index (20% criterion)

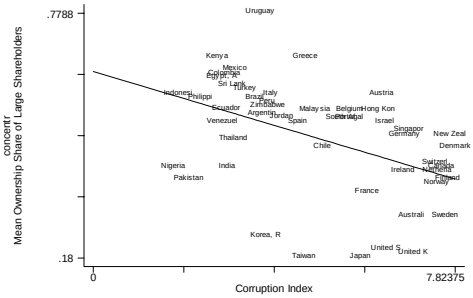

Figure 2 Mean Ownership Share of Large Shareholders vs. Corruption Index

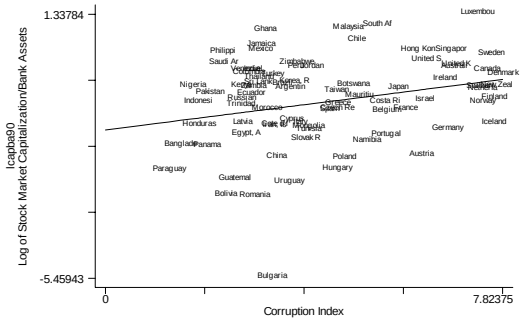

Figure 3 Log of Stock Capitalization/ Bank Assets vs. Corruption Index

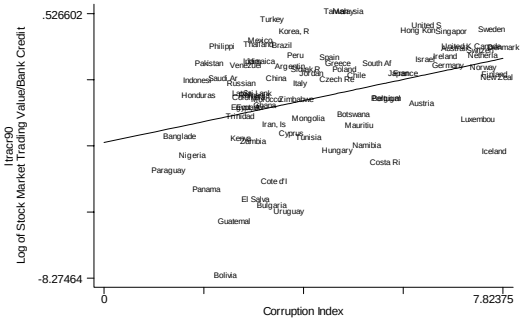

Figure 4 Log of Stock Trading Value/ Bank Credit vs. Corruption Index

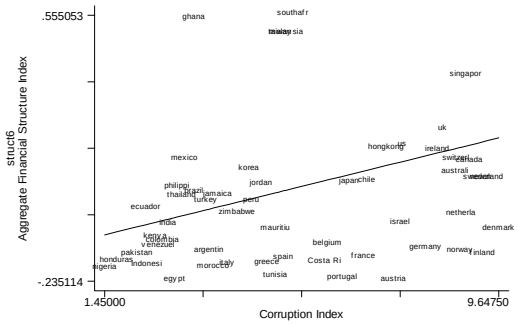

Figure 5 Aggregate Financial Structure Index vs. Corruption Index