Tax avoidance and ownership concentration

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Abstract

Tax avoidance may be limited by either public governance or private monitoring. Furthermore, the quality of the tax system and the quality of investors' protection affect ownership concentration and investment. This paper presents a formal model that determines ownership concentration in an asymmetric information framework where investors and the government set incentive constraints to limit tax evasion. It turns out that in countries with a weak tax system and a high degree of corruption, the improvement of investors' protection does not lead to more investment since private monitoring is too costly for monitoring investors. If the tax system is efficient, however, private monitoring is a substitute for public governance and an improvement of investors' rights will decrease ownership concentration and increase the number of investment projects realized. As a consequence, policy makers should *first* allocate funds to reduce corruption and tax avoidance and *later on* improve the legal system protecting investors. The theoretical results are supported by an empirical analysis.

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1 Introduction

High ownership concentration on the firm's level means that the firm is owned by a single owner family or has an influential majority shareholder, whereas low ownership concentration is characterized by widely held shares. On the macroeconomic level, high ownership concentration - many firms are held by few wealthy families - points more in the direction of financial markets that are not fully developed. Insufficient legal protection of external investors,

high corruption on the firm level and on the government level, and inefficiency of the tax system have been identified as reasons for high ownership concentration. With underdeveloped financial markets, a number of investment projects may not be carried out due to a lack of funds. Growth is lower than in countries with a well developed financial market. Improvement of corporate governance in emerging economies is an important question because poor private corporate governance is detrimental to economic activity. If corruption is high, bureaucracy and corporate insiders pursue their own interests at the expense of outside investors. Outside investors have to set incentives implying a high personal contribution of the entrepreneur. A high level of ownership concentration is then a measure of weak corporate governance. As a consequence, a large number of less wealthy entrepreneurial families face a rationing of external funds and the number of funded and profitable projects is low.

When asking how emerging and transition economies could improve corporate governance in their country the literature falls into two main categories. One group proposes that countries should improve investors' protection or security laws, see e.g. Schleifer and Wolfenzon [2002], a second group proposes that they should fight against corruption, see Desai, Dyck and Zingales [2007].

The existing theory and empirical evidence, however, do not provide any clear guidelines for policy makers and the World Bank which of the two ways to follow. This paper aims to fill the gap. In a theoretical model with asymmetric information outside investors provide incentive constraints for the entrepreneur to engage in the honest project. Private monitoring is costly and the outcome depends on the level of investors' protection. The government, on the other hand, spends tax income either on the improvement of investors' protection or on the improvement of the fight of tax evasion. If the degree of corruption in the government itself is too high, private monitoring is too costly and the government should concentrate on the reduction of the black market activity. If a certain threshold of lower corruption is reached, private monitoring becomes a substitute for public monitoring and public expenditures should be used to improve the judiciary. An empirical study supports this result. We divide countries in two groups depending on the quality of their tax system. It turns out that ownership concentration does no longer depend on the legal protection of investors for countries with weak tax systems: only corruption matters. Conversely, for countries with efficient tax systems, ownership concentration depends only on the legal protection of investors: corruption no longer matters. In earlier studies, this difference was not noticed, since in the whole sample the effect of the indices of the quality of legal protection of investors on ownership concentration dominated. But

it was only driven by the significance of the observations related to countries with efficient tax systems and not by other observations. With the same data set, the answer to the policy maker dilemma is now different. Most importantly, improving the tax system is a priority with respect to improving the legal system protecting investors in emerging economies when public funds are limited.

The paper is organized as follows: Section 2 presents the related literature. Section 3 presents investors' and entrepreneurs' behaviour leading to monitoring versus non monitoring regimes. In section 4 the empirical results are stated. Section 5 concludes.

2 Related literature

The literature on taxes and corporate finance includes the key concepts of the tax adjusted weighted average cost of capital and Miller [1977] equilibrium, see Auerbach [2002]. The literature on tax evasion started with Allingham and Sandmo [1972], who model individual taxpayers' decision on whether and how much to evade taxes. The individual maximizes expected utility and faces a probability of paying a penalty in case of detected tax evasion. Further contributions are made by Slemrod and Yitzhaki [2002] and Cowell [2004]. Slemrod [2004] stresses the differences between individual and corporate tax compliance, arguing that the latter should be analysed in a principal agent framework.

Papers on taxes and corporate governance model corporate tax evasion by informed majority shareholders or by the chief tax officer. Chen and Chu [2005] investigate corporate tax evasion in a standard principal-agent model (Holmstrom [1979]) in which a risk neutral owner of a firm hires a risk averse manager. They focus on the efficiency loss due to the separation of management and control. Using a costly state falsification framework, Crocker and Slemrod [2005] demonstrate that increasing the severity of penalties imposed on the chief financial officer (CFO or tax manager) is more effective in reducing tax fraud than increasing the penalty imposed on shareholders, even if the optimal CFO bonus scheme decided by shareholders increases with reported tax deduction, because shareholders do not know whether the tax deduction is legal or illegal, see also Lacker and Weinberg [1989] and Crocker and Morgan [1998]. Desai, Dyck et Zingales [2007] determine the amount of tax fraud by informed shareholders facing a penalty increasing with the square of the amount of tax fraud multiplied by the average of two parameters measuring first the quality of tax inspection and second the given quality of costless private monitoring, for a given insiders' ownership concentration.

Tax fraud increases with the corporate income tax and decreases with the quality of both types of control.

The above models consider three different types of agents: informed shareholders, outside shareholders and the government. Using an incentive compatibility contract framework designing private incentives (Holmstrom and Tirole [1997]), the model in this paper introduces a fourth party: private monitoring investors in charge of corporate governance. The model explains (a) the costly decision by *a-priori* uninformed investors to monitor and their related demand for law protecting minority investors and (b) the degree of ownership concentration by insiders and the number of profitable and financed projects, taking into account the public governance of the tax system and of the legal system.

3 The model

3.1 Decision problems of the economic agents

The model has different types of agents: entrepreneurs, outside investors, and the government. Entrepreneurs are majority shareholders, for example a family owning a firm, who have inside information about the investment projects pursued in the firm. Outside investors may either be private non-monitoring investors such as national or foreign agents who have no access to inside information about the firm or private monitoring investors such as the delegates of shareholders representing them at the board(s), rating institutions, financial analysts, financial intermediaries who have the possibility to gain additional insights about the financial position of the firm at a certain cost. The government is represented by civil servants, here one may think of tax collectors, tax inspectors and civil servants in charge of the defense of investors property rights: judges, police, financial market authorities, banking regulators. At the beginning of the period, financial contracts are signed, investment decisions are made, and the public level of investor protection is decided upon based on expected tax income of the government. At the end of the period, investment returns are realized, corporate income tax is collected and claims are settled. Entrepreneurs and uninformed investors are risk neutral and protected by limited liability so that no one can end up with a negative cash position. The government budget is fully tax financed without deficits.

A continuum of **entrepreneurs** is indexed by i and uniformly distributed on [0,1]. Entrepreneurs differ only with respect to their initial wealth (or internal equity) $1 \geq E_{0i} \geq 0$ distributed according to the cumulative distribu-

tion function $F(E_0)$. Aggregate entrepreneurs wealth is given by: $\int_0^1 E_0 dF(E_0)$. The investment project requires a fixed amount of capital, normalized to one: $K = 1$. The entrepreneur invests part of his wealth E_i, $(E_i \leq E_0)$ and calls for external funds $B = 1 - E$ provided by outside investors. The rate of return of the investment project is denoted R_K. The entrepreneur chooses between two activities: either he fully engages in the investment project which has then a probability of p_H of success, or he puts less effort in the official investment project and engages additionally in a hidden economy activity. Black market activity leads to a certain return and, at the same time reduces the probability of success of the official project to p_L, as in Holmstrom and Tirole [1997]. With probabilities of $1-p_H$ and $1-p_L$, respectively, the official investment project fails and its return is equal to zero. The behaviour of the entrepreneur is not directly observable, since a return of zero can be the consequence of a hidden-market activity, but also of bad luck. Paying out a return to outside investors, on the other hand, does not mean that there has been no hidden-market activity, since there remains a positive, but lower probability of success for the declared project. The return of the hidden-market activity is not revealed to the outside investor, nor to the government, hence no taxes are paid. We assume, however, that monitoring efforts of the outside investor or the government reduce the return on this activity. Incentive constraints are introduced to ensure that the entrepreneur engages in the honest project. If the entrepreneur does not invest all his wealth in the firm, $E < E_0$, the remaining part is invested at the risk-free rate R_0.

A financial contract determines the rate of return R for outside investors financing $B = 1 - E$. The expected after tax return for the entrepreneur when remaining honest is:

$$R_E E = p_H \left((1 - \tau) R_K - RB \right). \tag{1}$$

In the alternative project, the expected after tax return of the entrepreneur is:

$$R_E E = p_L \left((1 - \tau) R_K - RB \right) + \gamma R_X (G_{tax}) \tag{2}$$

where $R_X(G_{tax}) > 0$ is the return of the hidden-market activity. This return decreases with public expenditures G_{tax} devoted to detecting tax aversion. $\gamma \leq 1$ is a parameter that represents the monitoring activity of outside investors; $\gamma = 1$ indicates that there is no private monitoring, the return on the hidden-market activity depends only on the monitoring of the government. A small γ indicates larger private monitoring; and dishonest behaviour becomes less profitable. We assume that the return on black-market activity, as opposed to the return on the regular investment, underlies no uncertainty for the entrepreneur.

Outside investors fall into two groups: monitoring and non-monitoring investors. Since the model describes a small open economy facing a world risk-free interest rate R_0, outside investors require at least a rate of return of R_0. It is assumed that the official project when the entrepreneur also invests in the parallel economy has a strictly negative net present value, whereas the project when the entrepreneur does not invest in the parallel economy has a positive net present value:

$$p_L R_K < R_0 \leq p_H R_K. \tag{3}$$

This condition implies that the large number of risk neutral uninformed investors facing the opportunity cost R_0 set an incentive constraint on entrepreneurs.

All outside investment B consists of funds provided by uninformed investors B_u asking for a rate of return of R_u and funds provided by governing investors B_g asking for a rate of return of R_g. Monitoring investors can reduce the return from the parallel economy by a factor γ. Since this governing is costly they require a higher rate of return on their investment. The private cost of corporate governance $c\left(G_{law}\right)$ depends on public spending allocated to the judiciary, G_{law}.[1] If public spending on the judiciary increases, private cost of corporate governance decreases, since it is easier, quicker, more efficient to go to court and win a case against a dishonest entrepreneur.

The required rate of return on outside investment is then a weighted average of the two required rates of return:

$$R = R_u \frac{B_u}{B} + R_g \frac{B_g}{B}, \tag{4}$$

with $R_0 \leq R_u < R_g$. Overall cost of capital for outside investors is then:

$$RB = R_u B_u + R_g B_g. \tag{5}$$

The government receives income by collecting taxes and spends this income on the tax system and on the judiciary. The spending on the tax inspection will reduce the possibility of tax evasion directly, the spending on the judiciary will reduce the possibility of tax evasion indirectly since it reduces the cost of private monitoring. Due to corruption part of the tax income is diverted. With Π aggregate taxable profits and τ the rate of corporate taxes, $\tau\Pi$ is the income of the government. A proportion of this income disappears due to corruption; what remains is $\alpha_{cor}\tau\Pi$, $0 < \alpha_{cor} < 1$

[1] This cost function is the envelope of the cost functions of all types of private monitoring investors.

where a small α_{corr} indicates a high level of corruption of tax collection. With α_{tax} the proportion of government budget granted to tax inspection ($0 < \alpha_{tax} < 1$) and α_{law} the proportion of the government budget spent on the improvement of the judiciary, we get:

$$G = G_{tax} + G_{law} = \alpha_{tax}\alpha_{corr}\tau\Pi + \alpha_{law}\alpha_{corr}\tau\Pi, \tag{6}$$

with $\alpha_{tax} + \alpha_{law} = 1$. The objective of the government is to have a high number of projects realized since this leads to higher growth in the economy.

In what follows we will first analyse the case when there are no private monitors, i.e. all outside investors are uninformed investors, and then introduce the contract with both, monitoring and non-monitoring outside investors.

3.2 Financial contract without private corporate governance

If there is no private corporate governance, the entrepreneur chooses the optimal amount of funds she invests in her firm E and the return for outside non-monitoring investors R_u. A large aggregate amount of internal funds indicates high degree of ownership concentration. Investors protect themselves by setting an incentive constraint which ex ante enforces the no-tax-fraud and no-diversion decision. Then the entrepreneur maximizes the after-tax income of the no-tax-fraud project, taking into account her opportunity cost R_0, which is the risk-free return for the remaining part of her wealth not invested in her project $(E_0 - E)$:

$$\max_{E,R_u} p_H \left((1-\tau) R_K - R_u B_u\right) + R_0 \left(E_0 - E\right). \tag{7}$$

subject to five constraints:

- The entrepreneur (or family) wealth E_0 limits the amount of funds she provides for her project:

$$0 \leq E \leq E_0. \tag{8}$$

- At the start of the period, assets equal liabilities:

$$E + B_u = K = 1 \Rightarrow B_u = 1 - E. \tag{9}$$

- At the end of the period, the corporate income in case of success provides a definition for the rate of return R_E on the entrepreneur's equity:

$$R_E E = (1-\tau) R_K - R_u B_u. \tag{10}$$

Otherwise the return is equal to zero.

- The participation constraint of a large number of risk neutral and uninformed investors in perfect competition on the capital market, facing the opportunity cost of a return on the risk-free asset R_0: the expected return when investing in the firm has to be greater or equal to the return when investing in the risk-free asset.

$$p_H R_u B_u \geq R_0 B_u. \tag{11}$$

The aggregate supply of funds is not limited: there may be national or foreign investors.

- The incentive constraint put forward by private outside investors:

$$p_H R_E E \geq p_L R_E E + R_X \left(G_{tax}\right). \tag{12}$$

This constraint states that the expected profit of the entrepreneur without tax fraud is at least equal to the expected gain with tax fraud, so that the entrepreneur decides not to divert funds. Public spending depends on aggregate profit: $G = \alpha_{corr} \tau \Pi_{ng}$, with Π_{ng} (the subscript ng stands for "no governance") the tax base of aggregate profits obtained by summing up the number of financed projects taking into account the distribution of wealth of entrepreneurs in the country:

$$\Pi_{ng}\left(E_{ng}\right) = p_H R_K \left(1 - F\left(E_{ng}\right)\right). \tag{13}$$

Proposition 1. *Without private monitoring, a minimum ownership concentration E_{ng} is determined as:*

$$E_{ng} = 1 - (1-\tau)\frac{p_H R_K}{R_0} + \frac{p_H R_X \left(\alpha_{corr}\alpha_{tax}\tau\Pi_{ng}(E_{ng})\right)}{\left(p_H - p_L\right) R_0}. \tag{14}$$

It decreases with the efficiency of the public governance of the tax system:

Proof: see appendix 1.

The ownership concentration equality 14 is an implicit function in E_{ng}. When ownership concentration increases, it decreases the tax base, which decreases the public funding of the tax system, which increases the return from diverting funds from the tax system. The computation of the sign of the sensitivity of ownership concentration to exogenous variables is given in appendix 1. Ownership concentration decreases with the net present value of the official project $p_H R_K / R_0$. Ownership concentration increases with the degree of corruption of tax inspectors, a smaller α_{cor}, and a smaller proportion α_{tax} of public funding directed towards the tax system since $R_X^{'} < 0$.

In this setting without private governance, it is useful for the government to spend the tax income only on tax inspection rather than on the improvement of the judiciary. The effect of the tax rate τ is ambiguous: an increase of taxation rises the return on tax fraud, whereas it provides more public funds to fight against tax fraud. Since the incentive constraint is binding insiders have to co-invest with minority shareholders, so that outside investors are able to protect their investment with a minimal use of the monitoring tools of corporate governance supported by the legal system. Ownership concentration is a substitute for legal protection. Hence, the demand for law protecting uninformed investors is low. The social cost of the scheme is incurred by a number of less wealthy families in the country who suffer from external capital rationing.

3.3 Financial contract with corporate governance

In the alternative contract costly private monitoring decreases the return from the parallel economy. In exchange a higher rate of return is demanded by these private monitors. The entrepreneur maximizes her return by determining her own contribution E, the share of the capital financed by monitoring investors B_g and its rate of return R_g, and the rate of return for non-controlling uninformed shareholders R_u:

$$\max p_H \left((1-\tau) R_K - R_u B_u - R_g B_g \right) + R_0 \left(E_0 - E \right) \tag{15}$$

subject to seven constraints:

- The entrepreneur's own contribution is limited by her personal wealth E_0:

$$0 \leq E \leq E_0. \tag{16}$$

- At the start of the period, total liabilities are equal to total assets:

$$E + B_u + B_g = 1. \tag{17}$$

- At the end of the period, the after tax rate of return of the entrepreneur in case of success is given by:

$$R_E E = (1-\tau) R_K - R_u B_u - R_g B_g. \tag{18}$$

- The participation constraint of non-monitoring investors states that the expected return when investing in the firm has be larger or eqaul to a risk-free investment on the international capital market:

$$p_H R_u B_u \geq R_0 B_u. \tag{19}$$

- The participation constraint of monitoring investors is:

$$p_H R_g B_g - c\left(G_{law}\right) \geq R_0 B_g. \tag{20}$$

- Non-monitoring outside investors set incentives constraints so that monitoring outside investors really spend the cost of monitoring, $c\left(G_{law}\right)$. The expected gain of monitoring investors if they control (which insures that the probability of success of the official project is p_H) has to be at least equal to their expected gain when they do not control (in this case, the probability of success of the official project is only p_L).[2]

$$p_H R_g B_g - c\left(G_{law}\right) \geq p_L R_g B_g. \tag{21}$$

- The expected gain of the entrepreneur if she does not invest in the parallel economy has to be higher than if she invests in the parallel economy taking into account that private corporate governance decreases her returns from the parallel economy by a factor γ:

$$p_H R_E E \geq p_L R_E E + \gamma R_X\left(G_{tax}\right). \tag{22}$$

Taking into account that government expenditures depend on the profit of the firm we can solve this program.

Proposition 2. *In the corporate governance regime, ownership concentration decreases with the efficiency of public governance of the judiciary and with the efficiency of public governance of the tax system, The extent of the effect of the judiciary is measured by the parameter γ ($0 \leq \gamma < 1$), where a small γ indicates a high effect of private governance:*

$$E_g = 1 - \frac{p_H\left(1-\tau\right)R_K}{R_0} + \frac{c\left(G_{law}(E_g)\right)}{R_0} + 0 \leq \gamma < 1 \gamma \frac{p_H R_X\left(G_{tax}\left(E_g\right)\right)}{\left(p_H - p_L\right)R_0}. \tag{23}$$

Proof: see appendix 2.

In this contract, the weighted average cost of capital increases because of the monitoring cost of corporate governance. The corporate governance contract is only chosen by entrepreneurs with personal wealth below E_{ng} (the minimal internal equity required in the non corporate governance contract) and above E_g as defined in proposition 2. Since more projects are realized aggregate profit Π increases by adding the number of newly financed projects taking into account the distribution of wealth of entrepreneurs in the country:

$$\Pi = \Pi_{ng} + \Pi_g = \int_{E_{ng}}^{1} p_H R_H \mathrm{d}F(E) + \int_{E_g}^{E_{ng}} p_H R_H \mathrm{d}F(E) = p_H R_K\left(1 - F(E_g)\right). \tag{24}$$

[2] Otherwise, monitoring investors could receive the premium $R_g - R_u$ without spending the cost of monitoring.

The ownership concentration equality is an implicit function in E_g since government expenditures depend on aggregate profit Π which itself depends on ownership concentration E_g. High ownership concentration corresponds to low aggregate profit since few investment projects can be financed. This leads to a low tax base, which decreases the public funding of the tax system, which increases the return from diverting funds from the tax system. The computation of the sign of the sensitivity of ownership concentration to exogenous variables is given in appendix 2. Ownership concentration decreases with the net present value of the official project $p_H R_K / R_0$. Ownership concentration decreases when there is a higher proportion α_{law} of public funding directed towards the legal system, and when there are less public funds diverted due to corruption (a higher α_{cor}), and a higher tax rate τ (when γ is close to zero). It is possible that monitoring by private outside investors is sufficiently efficient to be a substitute to public governance, so that the effect of tax auditing on ownership concentration in developed countries is tiny.

If, however, γ is not close to zero, ownership concentration may increase, with sensitivities decreased by a factor γ with respect to proposition 1, with the degree of corruption of tax inspectors (a smaller α_{cor}) and a smaller proportion α_{tax} of public funding directed towards the tax system. The effect of the tax rate τ is again ambiguous: an increase of taxation rises the return on tax fraud, whereas it provides more public funds to fight against tax fraud or improve investors protection.

3.4 Modeling entrepreneurs' and investors' decisions of corporate governance

Entrepreneurs who face capital rationing in the first contract without corporate governance turn to the contract with corporate governance with a higher $WACC$, if the capital ownership requirement for entrepreneurs is lower than in the contract without corporate governance. Then, the condition $E_g < E_{ng}$ determines the development of the corporate governance regime: Demand for corporate governance by entrepreneurs is met by a supply of governance by some investors who expect to recover their monitoring cost. If this condition is fulfilled, an additional number of entrepreneurs whose initial wealth $E_{0,i}$ is between $[E_g, E_{ng}[$ are financed. In this economy, a smaller ownership concentration of insiders is observed: $E_g < E_{ng}$. This leads to a minimum requirement of capital of the entrepreneur:

$$E \geq E_g^{\min} = 1 + \frac{c\left(G_{law}\right)}{R_0} + \gamma \frac{p_H}{\left(p_H - p_L\right)} \frac{R_X\left(G_{tax}\right)}{R_0} - \frac{p_H\left(1-\tau\right) R_K}{R_0}. \quad (25)$$

Corporate governance is chosen when $E_g < E_{ng}$, that is when the cost/benefit ratio of private governance is below the return in the parallel economy:

$$\frac{c\left(G_{law}\right)}{1-\gamma} < \frac{R_X\left(G_{tax}\right)}{\left(1-\frac{p_L}{p_H}\right)}. \tag{26}$$

To get further results we use a first order Taylor approximation for the function of private cost of corporate governance, $c(G_{law}) = C_0 - c_0 G_{law}$, where c_0 indicates the marginal efficiency of the use of public funds in protecting investors, thus reducing the private cost of corporate governance. For the function of the return of the hidden-market activity we assume $R_X\left(G_{tax}\right) = R_{X_0} - r_{X_0} G_{tax}$, where R_{X_0} indicates the return of the hidden market if the government does not control and r_{X_0} indicates the marginal efficiency of government expenditures when fighting tax evasion, i.e. how much does the return on the hidden market activity decrease if the government increases spending on tax control by one unit. Then we can prove proposition 3:

Proposition 3. *For given* α_{tax} and α_{law}, *private corporate governance occurs if and only if the index ensuring a lower degree of corruption within the tax system,* α_{cor}, *is larger than an endogenous threshold denoted* $\underline{\alpha}_{corr}$*:*

$$0 < \frac{\frac{C_0}{1-\gamma} - \frac{R_{X_0}}{\left(1-\frac{p_L}{p_H}\right)}}{\left(\frac{c_0\alpha_{law}}{1-\gamma} - \frac{r_{X_0}\alpha_{tax}}{\left(1-\frac{p_L}{p_H}\right)}\right)\tau\left(\Pi_{ng}+\Pi_g\right)} = \underline{\alpha}_{cor} < \alpha_{cor} \tag{27}$$

provided $\frac{C_0}{1-\gamma} - \frac{R_{X_0}}{\left(1-\frac{p_L}{p_H}\right)} > 0$ *and* $\frac{c_0\alpha_{law}}{1-\gamma} - \frac{r_{X_0}\alpha_{tax}}{\left(1-\frac{p_L}{p_H}\right)} > 0$.

$\frac{C_0}{1-\gamma}$ and $\frac{c_0\alpha_{law}}{1-\gamma}$ represent absolute and marginal efficiency indices of the legal system, whereas $\frac{R_{X_0}}{\left(1-\frac{p_L}{p_H}\right)}$ and $\frac{r_{X_0}\alpha_{tax}}{\left(1-\frac{p_L}{p_H}\right)}$ represent absolute and marginal efficiency indices of fighting tax evasion. The condition holds when both the absolute and marginal efficiency indices of the legal system are larger than the efficiency indices of the tax system. As a consequence of this theorem, the government of a country with a high degree of corruption within the tax system, what we call a weak-tax-system country, should use the tax revenues to fight tax evasion, thus increasing tax revenues. Improving the judiciary and investor protection is not helpful, since private monitoring remains too costly. For efficient-tax-system countries, on the other hand, improving the judiciary is useful since it decreases the cost of private governance and thus attracts more outside investors.

4 Empirical evidence: the demand for law and the private versus public governance substitution effect

4.1 The data

In this empirical part of the paper we want to analyse the effects of tax evasion and corruption on ownership concentration, on the one hand, and effects of the efficiency of the legal system and investor protection on ownership concentration, on the other hand. To estimate and test these effects, we combine indicators from two different data sets: first, public governance indicators from at most 69 countries used by Friedman et al. [2000], and, secondly, financial and corporate indicators from at most 35 countries used by La Porta et al. [1999] and Stulz [2005]. India, New Zealand, South Africa and Turkey belong to the second sample, but not to the first, so that the number of countries in the joint database is $N = 31$. About half of them are emerging economies and the other half developed economies. Like the four studies mentioned before, namely, La Porta et al.[1999], Stulz [2005], Fogel [2006], Gourevitch and Shinn [2005], we face the problem of a small sample. Nevertheless, our results seem to be significant since the p-values of type I error on Student t-tests on the parameters of the regressions turn out to be small. Furthermore, we evaluate the power of these tests, or the probability of type II error as is suggested by McCloskey and Ziliak [1995]).

After having experimented with the available 24 variables of the database, we retained only 8 variables in the reported regressions: 31 countries are sorted by *EffTax*, which is the "tax level and efficiency of taxation" index published by the Heritage foundation for the year 1997. It measures the tax rates on corporate profits, income and "other significant activities". The assessment includes both average and marginal tax rates, as well as a view of how the tax system is administered. This tax index is scaled from one to five, with ten possible values, increasing with the level of taxation and the efficiency of the tax system. It is a measure of corruption and efficiency within the tax system (the parameter α_{cor} in the theoretical model).

In order to investigate if the efficiency of the tax system matters for corporate governance and ownership concentration, as is proposed by proposition 3, we use this index to split the countries in two groups. Countries with an index smaller or equal to 3.5 are countries with a weak tax system ($N = 12$). This group, however, includes three so called "tax havens" with offshore financial centers, namely Switzerland, Hong Kong and Singapore. Countries with an index larger or equal to 4 are countries with an efficient tax system,

$N = 19$.[3]

The dependent variable measuring ownership concentration $CLOSEEW$ is denoted E as in the theoretical section above. It is the equally (value) weighted average fraction of firms' stock market capitalization held by insiders according to Worldscope in 2002. So it has a value between 0 and 1. GDP is gross domestic product per head. Four indices are taken from La Porta et al. [1999]. Two of the are related to corruption: $LessCor$ decreases with corruption, $LessExpRisk$ decreases with expropriation risk. The others are related to the legal system: $AntiDir$ is the index of minority protection, $EffJudic$ is the index of the efficiency of the judiciary. Another index of the efficiency of the judiciary denoted $RuleLaw$ is the Rule of Law and Judiciary index, Fraser Institute, 1995, which rates the equality of citizens under the law and access of citizens to a non discriminatory judiciary.

Table 1 reports univariate descriptive statistics. The fact that the standard error of the explained variable is relatively small with respect to the standard error of explanatory variables is helpful for the power of the parameter tests of multiple regressions. Table 2 presents rank correlation coefficients for each of the 8 variables. The fact that on average these coefficients are relatively high is also helpful for the power of the parameters tests of multiple regressions. Ownership concentration is highly negatively correlated (from -0.6 to -0.45) with five variables in this order: index of corruption, index of expropriation risk, index of efficient rule of law, index of efficiency of the judiciary, and GDP, whereas those five variables are highly positively correlated (0.8) with each other. The correlation coefficient of ownership concentration and the anti-director-rights variable is equal to -0.35. Table 3 presents correlation coefficients for the group of less efficient tax system countries. The correlation coefficients of ownership concentration with corruption increase, but the size of the correlation coefficient does not change much. By contrast, in table 4, which presents correlation coefficients for the group of efficient-tax-system countries, the correlation coefficient of the anti-director-rights index increases from -0.35 in the sample of weak-tax-system countries to -0.58 in the sample of efficient-tax-system countries, whereas the correlation coefficient of ownership concentration decreases from -0.79 to -0.13 in the sample of efficient-tax-system countries.

[3]This sample split differs from a sample split close to the median of GDP/head for Switzerland, Hong Kong, Singapore and Korea.

4.2 Simple regressions results

Figures 1a to 1c present a linear regression relating anti-director rights to ownership concentration. A confidence interval is added. In figure 1a, predicted ownership concentration ranges from 67% for Mexico (anti-director-rights index equal to 1) to 63% for Hong-Kong and Chile (anti-director-rights index equal to 5) in the group of weak-tax-system countries. In figure 1b, for the group of efficient-tax-system countries, predicted ownership concentration varies from 60% for Belgium (anti-director-rights index equal to 0) to 40% for Canada and Great Britain (anti-director-rights index 5). The predicted economic significance of the effect of the anti-director-rights index (law in the books protecting minority investors) on ownership concentration is large for efficient-tax-system countries, and negligible for weak-tax-system countries. The difference of the economic significance of the effect is much larger (-20% versus -5%) than the twofold effect suggested by the difference of estimated slopes: 0.020 versus 0.045. When the two groups of countries are pooled (figure 1c), the apparent very large economic significance of the effect of anti-director-rights index on ownership concentration for all countries is the same as the economic significance for the group of efficient-tax-system countries. Observing only diagram 1c without observing diagram 1b, one could wrongly conclude that also in weak-tax-system countries, a change of the anti-director-rights index will lead to an impact on ownership concentration.

Similar results are presented in figures 2a to 2c where a simple regression of corruption on ownership concentration is shown. In figure 2a, predicted ownership concentration shifts from 75% for Philippines (corruption index 2.9) to 50% for Switzerland (corruption index 10) in the group of weak-tax-system countries. On figure 2b, for the group of efficient-tax-system countries, predicted ownership concentration varies from 53% for Korea (corruption index 5.3) to 47% for Canada, Denmark, Finland, Norway, Sweden and Holland (corruption index 10). The economic significance of the effect of corruption on ownership concentration is very large for weak-tax-system countries (-25%), and negligible for efficient tax system countries (-5%). The difference of economic significance of the effect is again much larger than the threefold effect suggested by the difference of estimated slopes: 0.040 versus 0.012. When the two groups of countries are pooled (figure 2c), the apparent very large economic significance of the effect of corruption on ownership concentration for all countries is the same as the economic significance for the group of weak-tax countries.

Comparing figure 1b for the group of efficient-tax-system countries where the constant of the regression line with the anti-director-right index is 0.59

and figure 1a for the group of weak tax systems where the constant of the regression line with the corruption index is 0.86, it suggests that the constant differs in each group. When using a multiple regression with the pooled sample, one is able to test whether the difference of constants between the two groups is statistically different from zero (test 3 of the structural model, available in table 5).

The conclusion from this statistical analysis is that, ownership concentration may vary from 80% to 60% according to a large reduction of the corruption index, whereas ownership concentration may vary from 60% to 40% according to a large increase of the anti-director-rights index.

4.3 Multivariate regressions results

Table 5 presents multivariate regression results. In the first column, regression A replicates Stulz [2005] estimation over 31 countries instead of 35 countries. Ownership concentration is a decreasing function of the government-expropriation-risk index (the index increases with "less expropriation risk") and the anti-director-rights index (the index increases with more laws items protecting minority investors). The $R^2 = 0.489$ and the adjusted $R^2 = 0.452$ are relatively good. This regression is highly robust to the addition of a number of control variables related to financial development (GDP/head, Bond Capitalization/GDP, Stock Market Capitalization/GDP, and so on) and to the public governance indicators. It is the second best regression with two explanatory variables maximizing the R^2 combined from the 23 variables in the database: in the first one, the expropriation-risk index is substituted by the rule-of-law index ($R^2 = 0.508$), and by the corruption index, in the third best one ($R^2 = 0.452$). This is not surprising as these three indices are highly correlated (table 3).

The theoretical model of this paper predicts that, below a tax rate threshold, ownership concentration decreases with indicators of the public governance of the tax system (such as corruption index), and that, above the tax threshold, ownership concentration is much less sensitive to the public governance of the tax system and depends on the public governance of the legal system (not only formal law, but also the efficiency of the judiciary measuring the degree of corruption of judges). This is taken into account in regression B. The threshold value is close to the median value of the tax index $\mathbf{1}_{a>a^*} = (EffTax \geq 4)$. The parameter of the expropriation-risk index for countries over the tax threshold (cf. test 2: private governance as a substitute to public governance) and the anti-director-right index (cf. test 1: no demand for law protecting investors) for countries below the tax threshold are not significantly different from zero taking the 5% maximal level of the

p-value of type I error (p-values=41% and 56%, respectively). These multivariate tests confirm the results obtained with correlation coefficients and simple regression lines for each samples.

In regression C, we removed these two non significant variables in order to compare the adjusted $R^2 = 0.510$ between models including only significant parameters. This regression reveals three new effects with respect to the regression A. First, there is a regime shift with respect to a taxation threshold $\mathbf{1}_{a>a^*}$ which leads to a decrease of the concentration of ownership, with a differential intercept coefficient significantly different from zero for a p-value of type I error equal to 4.5%. Second, expropriation risk decreases the concentration of ownership only for countries below the taxation threshold. Third, the formal improvement of law protecting small investors decreases the concentration of ownership only for countries with high taxes (over the taxation threshold), with a p-value of type 1 error equal to 0.5%.

In regression D, we substitute the government-expropriation index used by Stultz [2005] by the La Porta et al. [1999] corruption index. This leads to another increase of the adjusted $R^2 = 0.577$ and a decrease of the $p - value$ of type I error for parameters, all below 1%.

In regression E, we introduce an interaction term between formal law (antidir index) and a measure of the efficiency of the judiciary (La Porta et al. [1999]) (similar results are obtained with the rule of law index: equality of citizens under the law and access of citizens to a non discriminatory judiciary (Fraser Institute, 1995)), with adjusted $R^2 = 0.614$. The p-value of the Student t-tests decreased for all explanatory variables.

In regression F, the index of the efficiency judiciary multiplies the dummy for efficient tax system countries used in regressions B to E, instead of interacting with a similar dummy times the anti-director rights index, with adjusted $R^2 = 0.626$, with all p-value of Students tests below 0.0015.

4.4 Robustness

In order to evaluate the type II error, we compute the power of the Fisher tests of the multiple regression E including three explanatory variables. It depends on the size of the sample, a rule of thumb states that 10 observations per explanatory variables are necessary, although this depends on the R^2 of the regressions. We obtain a power of the Fisher tests between 75% to 95% so that the probability of a type II error is at most 25% despite the small sample.

A final robustness check is done with respect to the endogeneity of the tax threshold using the Heckman [1990] selection model. We first estimate the linear probability model of belonging to the efficient-tax-system countries

with the best adjusted R^2 for two variables, among the 23 variables related to financial development and public governance:

$$\Pr\left(EffTax \geq 4\right) = \widehat{p} = -1.25 + 0.2LessExprisk - 0.38Sharecap.$$

The probability of belonging to the group of efficient-tax-system index increases with "less expropriation risk" and decreases with more share capitalization with respect to GDP. First, government expropriation risk is negatively correlated with the probability of being a high-tax index country. Conversely, this suggests that governments of weak-tax-system countries have difficulties to collect taxes and hence are more tempted to expropriate investors. Second, the high share-capitalization variable captures a group of weak-tax-system countries in the data set which are offshore centers with high GDP per head (Switzerland, Singapore and Hong-Kong). Setting $\widehat{p} < 0.5$ to forecast that a country belongs to the group of weak-tax-system countries and $\widehat{p} > 0.5$ to forecast that a country belongs to the group of efficient-tax-system countries leads to a perfect prediction.

Nonetheless, the linear probability model has drawbacks: it predicts probabilities above one and below one, residuals are not normal and there is heteroscedasticity. However, the probit model cannot be estimated with these two explanatory variables because of a perfect separation of the data set so that maximum likelihood estimates are not valid. In particular, there is a perfect prediction using the 50% threshold over the predicted probability ($\widehat{p} < 0.5$) for classifying weak or efficient-tax-system countries. We report the probit estimates with only one explanatory variable (the expropriation-risk index) with the highest R^2, so that there is not a complete separation of the countries (F is the cumulative standardized normal distribution):

$$\Pr\left(EffTax \geq 4\right) = \widehat{p} = F\left(-1.25 + 0.2LessExprisk\right)$$

We compute the inverse of the Mills ratio for each country. We check whether the endogenous selection of the tax threshold affects the above results on each subsample, as the tax threshold is highly correlated with the expropriation risk, which is itself highly correlated with the corruption index.

In table 5,the regression G for the group of low tax index countries (12 countries) has an adjusted $R^2 = 0.57$. The inverse of the Mills ratio is not significant. Regression H, for the group of high tax index countries (19 countries) has an adjusted $R^2 = 0.28$. The inverse of the Mills ratio is not significant. The adjusted R^2 is lower than in the first group, which suggests that the anti-director-right index can be improved, taking into account a measure of the efficiency of the judiciary.

5 Conclusion

Outside investors generally face a twin agency problem with respect to government bureaucracy and inside shareholders. The present paper suggests that this problem affects countries in different ways, depending on the level of corruption in the country. Policies improving outside shareholders' legal protection should be given priority only in economies with efficient tax systems. This will decrease ownership concentration and increase the number of financed projects.

For emerging economies with weak tax systems and high level of corruption, ownership concentration decreases and the number of financed projects increases when priority is given to policies fighting corruption in tax system. This will decrease the size of the underground economy, increase tax revenue, and in turn decrease the risk of expropriation of investors by government. In this context, writing codes of good conduct of informed shareholders, improving the investors' rights, changing formal law and the efficiency of the judiciary lacks credibility for local and foreign investors. Outside investors cautiously let entrepreneurs finance the bulk of their project and do not spend costly monitoring resources at loss. Hence, "state building" in Fukuyama's [2005] parlance is also a priority in order to improve private corporate governance, for a number of emerging economies.

A "big push" of public spending targeting both policies could lead directly to a regime shift with public governance, so that policy makers never face the dilemma put forward in this paper. But this contradicts observations of a large number of countries with weak tax systems and with foreign aid unable to compensate their shortage of public funds: policy makers and the World Bank have necessarily to be choosy when allocating public funding targeting institutional reforms.

We emphasized here that private microeconomic incentives for the supply of costly monitoring depends on public governance of the tax system and on the legal system. This is both a macroeconomic question since tax revenues are affected and a microeconomic question with the design of incentives inside the black box of public administration in order to fight corruption. The relationship between corporate governance and government focuses on the opposition between emerging and developed countries, which is indeed very important due to financial globalization.

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Appendix 1: If available, tax deductible external finance is chosen.

Expected profit is:

$$(1-\tau)\, p_H R_K - p_H R_u B_u + R_0 E + R_0 E_0,$$

To maximize profit the entrepreneur will pay the minimum rate of return to the outside investor: $p_H R_u = R_0 \Rightarrow R_u = R_0/p_H$. Together with the incentive constraint we get:

$$R_E E = (1-\tau)\, R_K - R_u B_u = (1-\tau)\, R_K - \frac{R_0}{p_H}(1-E) \geq \frac{R_X\,(G_{tax})}{p_H - p_L},$$

with $G_{tax} = \alpha_{tax}\alpha_{cor}\tau\Pi_{ng}$. The incentive constraint sets thus a minimal ownership concentration belonging to the entrepreneur, family or informed shareholders:

$$E \geq E_{ng} = 1 - \frac{p_H(1-\tau)R_K}{R_0} + \frac{p_H R_X\,(G_{tax})}{(p_H - p_L)\, R_0}.$$

As the wealth of entrepreneurs is normalized between zero and one, if $E_{ng} < 0$, all projects are financed, whatever the initial wealth of entrepreneurs. If $E_{ng} > 1$, no project is financed. In what follows, the assume that: $0 < E_{ng} < 1$, which implies an expected rate of return of the official project $p_H R_K$ high enough so that $E_{ng} < 1$ but not too much, so that $E_{ng} > 0$:

$$0 < E_{ng} < 1 \Leftrightarrow \frac{R_X\,(G_{tax})}{(1-\tau)\left(1-\frac{p_L}{p_H}\right)} < p_H R_K < \frac{R_0}{1-\tau} + \frac{R_X\,(G_{tax})}{(1-\tau)\left(1-\frac{p_L}{p_H}\right)}.$$

The entrepreneur invests her remaining wealth $E_0 - E_{ng}$ in the risk-free investment with a rate of return of R_0. In order to determine the returns from the parallel economy, the tax base of aggregate profits Π_{ng} is obtained in

summing up the number of financed projects as a function of the distribution of wealth of entrepreneurs in the country:

$$\Pi_{ng} = p_H R_K \left(1 - F\left(E_{ng}\right)\right).$$

The aggregate tax revenue with only uninformed investors is:

$$G_{ng} = \tau \Pi_{ng}$$

and

$$G_{tax}\left(E_{ng}\right) = \alpha_{corr}\alpha_{tax}\tau p_H R_K \left(1 - F\left(E_{ng}\right)\right).$$

The following ownership concentration equality is an implicit function. When ownership concentration increases, it decreases the tax base, which decreases public funding of the tax system, which increases the return from diverting funds from the tax system.

$$E_{ng} = h(z_i, E_{ng}) = 1 - \frac{p_H(1-\tau)R_K}{R_0} + \frac{p_H R_X\left(G_{tax}\right)}{\left(p_H - p_L\right)R_0}$$

with z_i any of the exogenous variables of the model. The sign of sensitivity of ownership concentration with respect to any of the exogenous variables is given by:

$$\frac{\partial E_{ng}}{\partial z_i} = \frac{\frac{\partial h}{\partial z_i}}{1 - \frac{\partial h}{\partial E_{ng}}}.$$

The sign of the sensitivity of $\frac{\partial E_{ng}}{\partial z_i}$ is the same as the sign of $\frac{\partial h}{\partial z_i}$ when the density f of the income distribution is sufficiently small at the family income E_{ng}, which is very likely to happen in the emerging economy context:

$$\begin{aligned}\frac{\partial h}{\partial E_{ng}} &= \frac{-p_H \frac{\partial R_X(G_{tax})}{\partial G_{tax}}\alpha_{tax}\alpha_{cor}\tau\left(p_H(1-\tau)R_K\right)f\left(E_{ng}\right)}{\left(p_H - p_L\right)R_0} < 1 \\ &\Leftrightarrow \quad p_H\alpha_{tax}\alpha_{cor}\tau f\left(E_{ng}\right) < \frac{-\left(p_H - p_L\right)}{\frac{\partial R_X(G_{tax})}{\partial G_{tax}}}\frac{1}{p_H\frac{R_K}{R_0}}.\end{aligned}$$

The public finance feedback of ownership concentration limiting the tax base increases the sensitivity of ownership concentration with respect to exogenous variables $\frac{\partial E_{ng}}{\partial z_i} > \frac{\partial h}{\partial z_i}$.

Appendix 2: Contract with corporate governance.
Profits can be written as:

$$\left(1-\tau\right)p_H R_K - p_H R_u B_u - p_H R_g B_g - R_0 E + R_0 E_0.$$

In order to maximize her profit, the entrepreneur provides the lowest possible return for outside investors. The participation constraint and the incentive constraint are then at their minimum. These two equations determine the rate of return for monitoring investors R_g and their share of capital B_g:

$$p_H R_g B_g - c\left(G_{law}\right) = p_L R_g B_g \text{and} p_H R_g B_g - c\left(G_{law}\right) = R_0 B_g \Leftrightarrow$$
$$R_g^* = \frac{R_0}{p_L} B_g^* = \frac{c\left(G_{law}\right)}{R_0} \frac{p_L}{p_H - p_L} \Rightarrow R_g^* B_g^* = \frac{c\left(G_{law}\right)}{p_H - p_L}.$$

Perfect competition between non monitoring investors determines their rate of return R_u, which leads to the same risk premium as in the contract without corporate governance. It is lower than the return of monitoring investors spending the cost of corporate governance:

$$R_u = \frac{R_0}{p_H} < R_g^* = \frac{R_0}{p_L}.$$

Maximizing profit amounts to:

$$\max\left(1-\tau\right) p_H R_K - R_0\left(1 - E - B_g^*\right) - \frac{p_H}{p_L} R_0 B_g - R_0 E + R_0 E_0$$

subject to the incentive constraint:

$$R_E E = \left(1-\tau\right) R_K - \frac{R_0}{p_H}\left(1 - E - B_g^*\right) - \frac{R_0}{p_L} B_g^* \geq \frac{\gamma R_X\left(G_{tax}\right)}{p_H - p_L}.$$

The incentive constraint states that non monitoring investors invest in the firm only when the entrepreneur owns at least a sufficiently large amount of capital denoted $E_g^{\min}$:

$$E \geq E_g^{\min} = 1 + \frac{c\left(G_{law}\right)}{R_0} + \gamma \frac{p_H}{\left(p_H - p_L\right)} \frac{R_X\left(G_{tax}\right)}{R_0} - \frac{p_H\left(1-\tau\right) R_K}{R_0}.$$

The entrepreneur chooses a minimal share exactly equal to $E = E_g^{\min}$. Her remaining wealth is held in the risk-free asset.

Corporate governance enlarges the tax base by Π_g which measures the aggregated profits of projects which were not financed in the "no governance" regime:

$$\Pi_g = p_H R_K \int_{\max\left(E_g^{\min}, 0\right)}^{E_{ng}} dF\left(E\right).$$

That is:

$$\Pi_g = p_H R_K \left(F\left(E_{ng}\right) - F\left(E_g\right)\right).$$

Tax collection in case of governance, denoted G_g is:

$$G_g = \tau\left(\Pi_{ng} + \Pi_g\right) > G_{ng} = \tau\Pi_{ng}.$$

The following ownership concentration equality is an implicit function of a non zero ownership concentration. When ownership concentration increases, it decreases the tax base, which decreases public funding of the tax system, which increases the return from diverting funds from the tax system.

$$\begin{aligned} E_g &= q(z_i, E_g) = 1 - \frac{p_H\left(1-\tau\right)R_K}{R_0} + \frac{c\left(\alpha_{law}\alpha_{cor}\tau\left(\Pi_{ng}+\Pi_g\right)\right)}{R_0} \\ &\quad +\gamma\cdot\frac{p_H R_X\left(\alpha_{tax}\alpha_{cor}\tau\left(\Pi_{ng}+\Pi_g\right)\right)}{\left(p_H - p_L\right)R_0}, \end{aligned}$$

with z_i any of the exogenous variables of the model. The sign of sensitivity of ownership concentration with respect to any of the exogenous variables is given by:

$$\frac{\partial E_g}{\partial z_i} = \frac{\frac{\partial q}{\partial z_i}}{1 - \frac{\partial q}{\partial E_g}}.$$

The sign of the sensitivity of $\frac{\partial E_g}{\partial z_i}$ is the same as the sign of $\frac{\partial q}{\partial z_i}$ when $0 < \frac{\partial q}{\partial E_g} < 1$, that is when the density f of the income distribution is sufficiently small at the family income value E_g:

$$\frac{\partial q}{\partial E_g} = \alpha_{cor}\tau\frac{p_H R_K}{R_0}f\left(E_g\right)\left[-\alpha_{law}\frac{\partial c\left(G_{law}\right)}{\partial G_{law}} - \alpha_{tax}\frac{\gamma p_H}{p_H - p_L}\frac{\partial R_X\left(G_{tax}\right)}{\partial G_{tax}}\right].$$

The public finance feedback of a larger tax base increases the sensitivity of ownership concentration with respect to exogenous variables $\frac{\partial E_g}{\partial z_i} > \frac{\partial q}{\partial z_i}$ because of a decrease of ownership concentration.

Appendix 3

Table 1: Descriptive statistics

Variable	N	Mean	Median	Std Dev	Minimum	Maximum
CLOSEEW	31	0.51613	0.51	0.13127	0.27	0.80
GDP	31	18859	19624	11963	1093	44437
LExpRisk	31	8.73968	9.4	1.39751	5.22	9.98
LessCor	31	7.78871	8.52	1.94855	2.92	10.00
EffTax	31	4.01613	4.5	0.92632	1.50	5.00
AntiDir	31	3.06452	3	1.36469	0	5.00
RuleLaw	31	6.29032	7.5	3.21915	0	10.00
EffJudic	31	8.20161	9	1.99627	3.25	10.00

Table 2: Correlation coefficients for all countries

Pearson RankCorrelation Coefficients, N = 31, Prob > |r| under H0: Rho=0								
CLOSEEW		LessCor -0.61121 0.0003	LExpRisk -0.60659 0.0003	RuleLaw -0.58335 0.0006	EffJud -0.52832 0.0023	GDP -0.45385 0.0103	EffTax -0.37777 0.0361	AntiDir -0.35210 0.0521
GDP		LessCor 0.83203 <.0001	LExpRisk 0.80240 <.0001	EffJudic 0.78190 <.0001	RuleLaw 0.75603 <.0001	CLOSEEW -0.45385 0.0103	EffTax 0.39374 0.0284	AntiDir -0.07556 0.6862
Less ExpRisk		LessCor 0.85088 <.0001	GDP 0.80240 <.0001	RuleLaw 0.71232 <.0001	EffJudic 0.70548 <.0001	CLOSEEW -0.60659 0.0003	EffTax 0.60575 0.0003	AntiDir 0.00683 0.9709
Less Cor		LExpRisk 0.85088 <.0001	EffJudic 0.84822 <.0001	GDP 0.83203 <.0001	RuleLaw 0.73561 <.0001	CLOSEEW -0.61121 0.0003	EffTax 0.39632 0.0273	AntiDir 0.12087 0.5172
EffTax		LExpRisk 0.60575 0.0003	RuleLaw 0.57965 0.0006	LessCor 0.39632 0.0273	GDP 0.39374 0.0284	CLOSEEW -0.37777 0.0361	AntiDir -0.23817 0.1970	EffJudic 0.20774 0.2621
AntiDir		E -0.35210 0.0521	EffTax -0.23817 0.1970	EffJudic 0.23060 0.2120	LessCor 0.12087 0.5172	RuleLaw -0.09546 0.6095	GDP -0.07556 0.6862	LExpRisk 0.00683 0.9709
RuleLaw		GDP 0.75603 <.0001	LessCor 0.73561 <.0001	LExpRisk 0.71232 <.0001	EffJudic 0.61303 0.0002	CLOSEEW -0.58335 0.0006	EffTax 0.57965 0.0006	AntiDir -0.09546 0.6095
EffJudic		LessCor 0.84822 <.0001	GDP 0.78190 <.0001	LExpRisk 0.70548 <.0001	RuleLaw 0.61303 0.0002	CLOSEEW -0.52832 0.0023	AntiDir 0.23060 0.2120	EffTax 0.20774 0.2621

Table 3: Correlation coefficients for countries with a less efficient tax system

Pearson Rank Correlation Coefficients, N = 12 Prob > |r| under H0: Rho=0							
CLOSEEW	LessCor -0.78774 0.0023	GDP -0.59846 0.0398	LExpRisk -0.58549 0.0455	EffJudic -0.50494 0.0941	RuleLaw -0.48908 0.1066	AntiDir -0.25524 0.4233	EffTax 0.24690 0.4391
GDP	LessCor 0.84989 0.0005	LExpRisk 0.77284 0.0032	EffJudic 0.71853 0.0085	RuleLaw 0.69371 0.0123	CLOSEEW -0.59846 0.0398	EffTax -0.26040 0.4137	AntiDir -0.01865 0.9541
LExpRisk	LessCor 0.85573 0.0004	GDP 0.77284 0.0032	EffJudic 0.69458 0.0122	CLOSEEW -0.58549 0.0455	RuleLaw 0.37746 0.2264	EffTax -0.26651 0.4024	AntiDir 0.03979 0.9023
LessCor	LExpRisk 0.85573 0.0004	GDP 0.84989 0.0005	EffJudic 0.81852 0.0011	CLOSEEW -0.78774 0.0023	RuleLaw 0.55168 0.0630	EffTax -0.34730 0.2687	AntiDir 0.16341 0.6118
EffTax	AntiDir -0.38151 0.2211	LessCor -0.34730 0.2687	EffJudic -0.34694 0.2692	LExpRisk -0.26651 0.4024	RuleLaw -0.26186 0.4110	GDP -0.26040 0.4137	CLOSEEW 0.24690 0.4391
AntiDir	EffJudic 0.42127 0.1726	EffTax -0.38151 0.2211	CLOSEEW -0.25524 0.4233	LessCor 0.16341 0.6118	RuleLaw 0.13598 0.6735	LExpRisk 0.03979 0.9023	GDP -0.01865 0.9541
RuleLaw	GDP 0.69371 0.0123	LessCor 0.55168 0.0630	CLOSEEW -0.48908 0.1066	EffJudic 0.46580 0.1270	LExpRisk 0.37746 0.2264	EffTax -0.26186 0.4110	AntiDir 0.13598 0.6735
EffJudic	LessCor 0.81852 0.0011	GDP 0.71853 0.0085	LExpRisk 0.69458 0.0122	CLOSEEW -0.50494 0.0941	RuleLaw 0.46580 0.1270	AntiDir 0.42127 0.1726	EffTax -0.34694 0.2692

Table 4: Correlation coefficients for countries with an efficient tax system

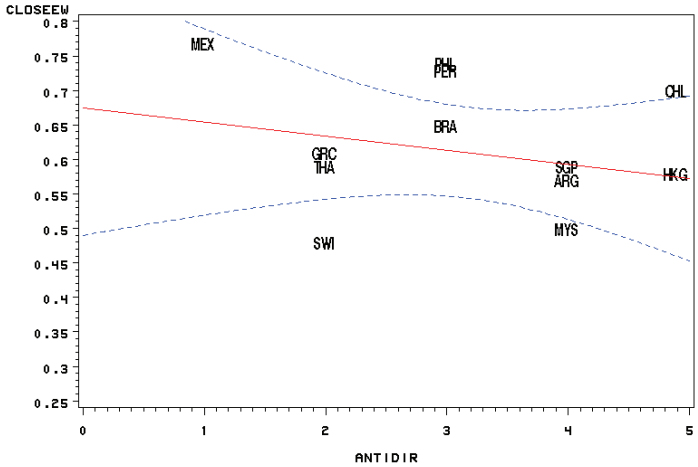
Pearson Correlation Coefficients, N = 19 Prob > |r| under H0: Rho=0							
CLOSEEW	AntiDir -0.57952 0.0093	EffTax 0.48802 0.0340	EffJudic -0.30404 0.2057	GDP 0.14235 0.5610	LessCor -0.13680 0.5765	RuleLaw -0.09950 0.6853	LExpRisk -0.00976 0.9684
GDP	EffJudic 0.73541 0.0003	LExpRisk 0.62272 0.0044	LessCor 0.61108 0.0054	RuleLaw 0.46492 0.0449	EffTax -0.27469 0.2551	CLOSEEW 0.14235 0.5610	AntiDir -0.08149 0.7402
LExpRisk	LessCor 0.72843 0.0004	EffJudic 0.70764 0.0007	GDP 0.62272 0.0044	RuleLaw 0.21116 0.3855	AntiDir 0.20921 0.3900	EffTax -0.09291 0.7052	CLOSEEW -0.00976 0.9684
LessCor	EffJudic 0.81232 <.0001	LExpRisk 0.72843 0.0004	GDP 0.61108 0.0054	RuleLaw 0.59520 0.0072	EffTax -0.27697 0.2510	AntiDir 0.22710 0.3498	CLOSEEW -0.13680 0.5765
EffTax	EffJudic -0.49999 0.0293	CLOSEEW 0.48802 0.0340	AntiDir -0.45584 0.0498	LessCor -0.27697 0.2510	GDP -0.27469 0.2551	RuleLaw -0.23262 0.3379	LExpRisk -0.09291 0.7052
AntiDir	CLOSEEW -0.57952 0.0093	EffTax -0.45584 0.0498	RuleLaw -0.34021 0.1541	LessCor 0.22710 0.3498	LExpRisk 0.20921 0.3900	EffJudic 0.19527 0.4231	GDP -0.08149 0.7402
RuleLaw	LessCor 0.59520 0.0072	EffJudic 0.56217 0.0122	GDP 0.46492 0.0449	AntiDir -0.34021 0.1541	EffTax -0.23262 0.3379	LExpRisk 0.21116 0.3855	CLOSEEW -0.09950 0.6853
EffJudic	LessCor 0.81232 <.0001	GDP 0.73541 0.0003	LExpRisk 0.70764 0.0007	RuleLaw 0.56217 0.0122	EffTax -0.49999 0.0293	CLOSEEW -0.30404 0.2057	AntiDir 0.19527 0.4231

Table 5: Determinants of Cross Country Ownership Concentration (p-value in)

	A	B	C	D	E	F	G	H
Intercept	1.1 (<0.0001)	0.975 (0.049)	0.922 (<0.0001)	0.867 (<0.0001)	0.867 (<0.0001)	0.860 (<0.0001)	0.996 (0.0002)	
Intercept*(tax quality >=4/5) **Differential coefficient**		-0.687 (0.22)	-0.329 (0.045)	-0.275 (0.009)	-0.279 (0.005)			
Intercept*(tax quality >= 4/5)								0.620 (<0.0001)
LExpRisk by government	-0.056 (0.001)							
LExpRisk by government *(tax quality < 4/5)		-0.041 (0.049)	-0.041 (0.041)					
LExpRisk by government *(tax quality >= 4/5) **Test : private governance is a substitute of public governance**		-0.018 (0.41)						
LessCor * (tax quality < 4/5)				-0.040 (0.004)	-0.040 (0.003)	-0.039 (0.001)	-0.053 (0.016)	
AntiDir	-0.033 (0.016)							
AntiDir *(tax quality < 4/5) **Test : No demand for law protecting investors**		-0.032 (0.56)						
AntiDir *(tax quality >= 4/5)		-0.047 (0.005)	-0.045 (0.005)	-0.045 (0.003)		-0.055 (<0.0001)		-0.048 (0.0159)
AntiDir* RuleLaw * (tax quality >= 4/5)					-0.00488 (0.0008)			
RuleLaw * (tax quality >= 4/5)						-0.029 (0.0015)		
Inverse Mills Ratio							-0.021 (0.411)	-0.077 (0.430)
Observations	31	31	31	31	31	31	12	19
Adjusted R2	0.45	-	0.51	0.577	0.614	0.626	0.57	0.28

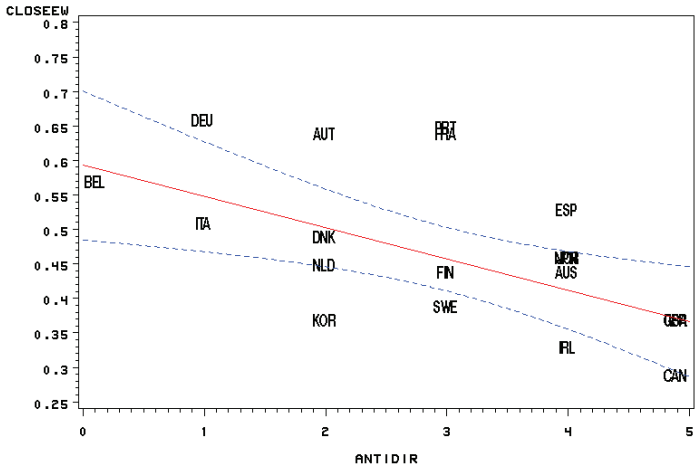
Figures 1: Ownership Concentration and Investors Legal Protection by tax quality groups and pooled sample

Ownership Concentration and Anti Director Rights: 12 Weak Tax System Countries



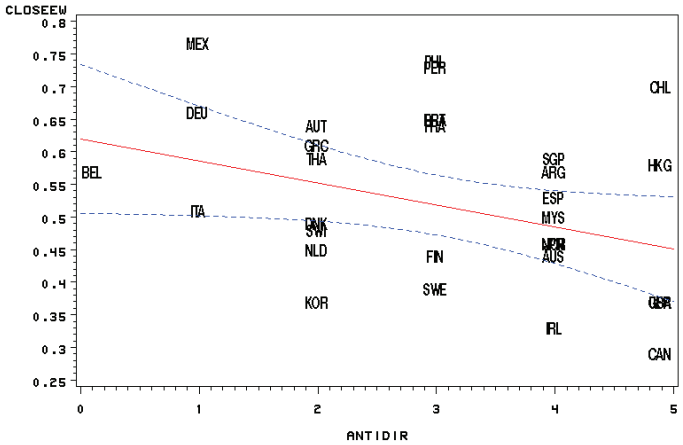
Regression Equation:
CLOSEEW = 0.674528 - 0.020377*ANTIDIR

Ownership Concentration and Anti Director Rights: 19 Efficient Tax System Countries



Regression Equation:
CLOSEEW = 0.592632 - 0.045263*ANTIDIR

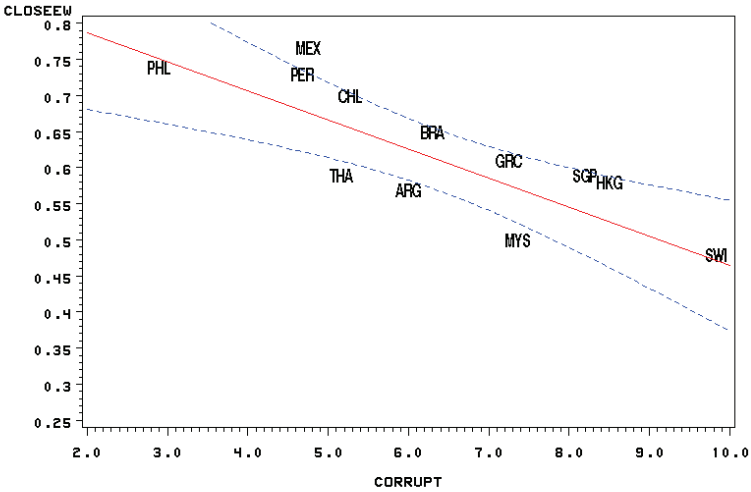
Ownership Concentration and Anti Director Rights: 31 countries



Regression Equation:
CLOSEEW = 0.619919 - 0.033868*ANTIDIR

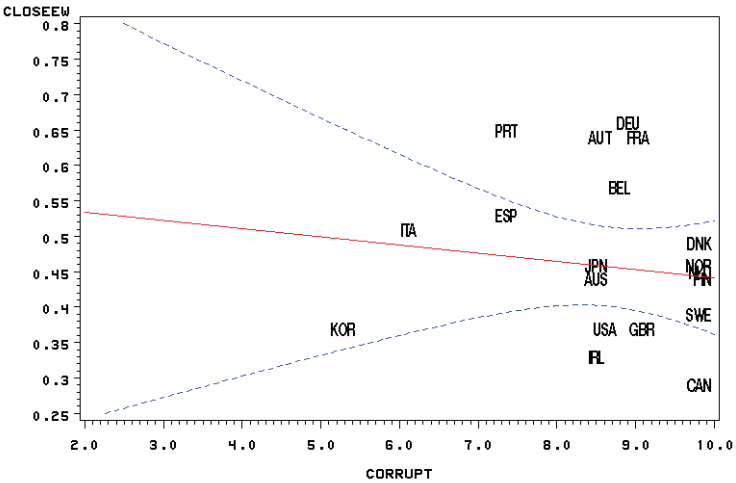
Figures 2: Ownership Concentration and Corruption Index by tax quality groups and pooled sample

Ownership Concentration and Corruption: 12 Weak Tax System Countries



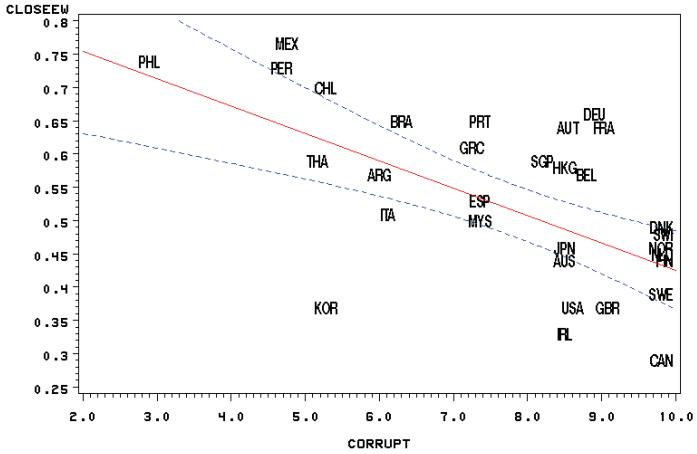
Regression Equation:
CLOSEEW = 0.867354 - 0.040317*CORRUPT

Ownership Concentration and Corruption: 19 Efficient Tax System countries



Regression Equation:
CLOSEEW = 0.557473 - 0.011598*CORRUPT

Ownership Concentration and Corruption: 31 countries



Regression Equation:
CLOSEEW = 0.83683 - 0.041175*CORRUPT