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Corporate Governance and Firm Performance in Ukraine*

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Abstract

This study investigates the impact of overall level as well as of separate elements of corporate governance on enterprise performance for public companies in Ukraine. We use unique data on corporate governance choices for above 5 thousand firms (around a half of all public companies in Ukraine) for three years from 2000 to 2002. We construct index/sub-indices of corporate governance describing such aspects of corporate governance as shareholder rights, transparency/information disclosure, board independence, chairman independence and ownership arrangements. The novelty of our approach is that we use social trust factors as instruments for corporate governance choices. We use a set of instrumental variables coming mainly from "trust" literature, in particular political diversity, religion and ethnic diversity, and methods of privatisation, to tackle possible endogeneity. We employ ordinary least squares (OLS), two-stage least squares (2SLS), two-stage generalized method of moments (2SGMM), fixed effects (FE), random effects (RE), fixed effects instrumental variables analysis (FE IV) and random effects instrumental variable analysis (RE IV) to analyse the governance effects in the framework of standard production function approach. We find strong evidence that corporate governance predicts firm performance in the transition context. We do not find significant evidence of reverse causation or other endogenous effects. OLS results predict that one-point-increase in our overall corporate governance index would result in around a half-percent increase in performance; and worst to best change in our overall corporate governance index predicts about 40% increase in company's performance. We document statistically and economically strong effects of such governance elements as shareholder rights, transparency and board independence on performance. We also find a negative effect of the independence of the board chairman on performance.

Keywords: Ukraine, corporate governance, firms

JEL Classification: G34, P2

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1. Introduction

The objective of the project is to analyze the impact of *overall* level and separate *elements* of corporate governance practices, on performance of joint-stock companies in transitional country, Ukraine. We aim at investigating the effects of governance not on market value, which is considerably affected by subjective views of investors, but on the *performance/efficiency* of enterprises, in terms of ability to generate revenues utilizing the available capital and labor resources. While there is a lot of research done on developed and developing economies, little is done for transitional economies and still there is no clear evidence on corporate governance effects in the environment where joint-stock form of business organization simply did not exist for about seventy years and now firms just start learning about international standards on information disclosure, shareholder rights, board structure and procedures, and about benefits associated with applying these standards. The major consequences of poor corporate governance practices which today persist in transitional countries are low utilization of employed resources (e.g. due to lack of appropriate incentive system, underdeveloped trust, wrong control and accountability system, etc) and, as a result, inability of companies to attract investment. Thus, proper corporate governance is vital for enhancing the development of enterprises (as well as an economy as a whole) and their long-term prosperity. Yet not many companies in countries of former Soviet Union (FSU) have transitioned to exercising good corporate governance. Why? Are the companies practicing better governance are also performing better? Or, is it more beneficial for a firm to be less transparent and neglect the shareholder rights? What is empirical evidence for this? The study aims at investigating the benefits (or loses) companies get from different governance practices at this stage of economy development. And eventually it shall provide an empirical evidence if and how companies would benefit from implementing better governance practices at the level of companies (either by companies itself on voluntary basis or by government's laws and regulations) in terms of performance.

Important problem in many corporate governance studies is possibility of endogenous effects of governance. For example, it might be the case of *reverse causality* when companies with higher performance also choose to practice better governance to further improve their performance. And we attempt to solve this issue and others (e.g. *optimal differences* problem*, quality signaling, omitted variable bias* (Black et al, 2003)) by applying *'trust'* literature to select appropriate instrumental variables and investigate the 'net' influence of corporate governance quality on enterprise performance.

We investigate the influence of *overall* level as well as *separate elements* of corporate governance quality on enterprise performance for a large set of joint-stock companies in Ukraine. We construct index/sub-indices of corporate governance quality using 14 governance indicators (giving equal weights to each indicator as well as applying Principal Factor Analysis (PFA) to calculate weights) describing such aspects of corporate governance as shareholder rights, transparency and supervisory board arrangements. We use a set of instrumental variables coming mainly from 'trust' literature, in particular religion, political and ethnic diversity, and methods of privatization, to tackle with possible endogenous effects. We employ OLS, 2SLS, 2SGMM, FE, RE, FE IV and RE IV to analyze the governance effects in the framework of standard production function approach.

We find strong evidence, which was not available earlier, that corporate governance causally predicts firm's performance in *transition* context. 2SLS, 2SGMM as well as RE IV and FE IV coefficients are larger then OLS, FE, RE coefficients and highly significant. We also do not find significant evidence of reverse causation or other endogenous effects. OLS results predict that one-point-increase in our overall corporate governance index would result in around a half-percent increase in net revenues; and worst to best change in our overall corporate governance index predicts about 40% increase in company's net revenues.

We document statistically strong effects of Shareholder Rights Sub-index, Transparency Sub-index and Board Structure Sub-index on performance. Importantly, our analysis provides the first strong evidence that board independence is important and relevant in a transition market. Surprisingly we do not find the positive effect of separation of responsibilities by CEO and Board Chairman on performance. On the contrary we document the indication that if the Chairman is not either also the CEO or at least employed at the company then it has a detrimental impact on performance.

The paper is organized as follows. In Part 2 we present an overview of related literature. Part 3 describes data and corporate governance measures we use. In particular Section 3.1 provides information on sources of data and descriptive statistics for our sample. Section 3.2 explains what we understand under corporate governance quality and how we construct corporate governance indexes. In Section 3.3 we present the instrumental variables that we use for dealing with econometric problems. In Part 4 we introduce our hypotheses and methodology. Preliminary estimation results are presented in Part 5 for OLS, in Part 6 for 2SLS/2SGMM, in Part 7 for panel and panel IV analysis and in part 8 for Principal Factor Analysis. Conclusions are given in Part 9.

2. Literature Review

2.1. General Theoretical Comments

If a firm has a multiple ownership, it may result in corporate governance problems. The owners/investors want to ensure that the professional managers they hire run the company in line with the best interests of its owners working with greatest possible efficiency that consequently maximizes the added value of the firm and the welfare of all of the owners. On the other hand, the managers or large shareholders want to maximize their own benefits. When interests of managers are not perfectly in line with those of owners, or when some owners expropriate rights of other shareholders there could be a substantial loss in firm's efficiency.

The notion of the corporate governance is quite comprehensive. It is often defined as a field in economics that investigates how to secure/motivate *efficient management* of corporations by the use of incentive mechanisms, such as contracts, organizational designs and legislation (Mathiesen, 2002). In words of Shleifer and Vishny (1997) "[c]orporate governance deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment."

The issue of corporate governance has become extremely important in the last decades in particular because corporations have reached a remarkable output growth and at present produce more then 90% of all world output. On the background of well-known bankruptcies of transnational corporations (e.g. Maxwell Group, Enron, WorldCom) the corporate governance issue is becoming one of the central issues in the aim of secure and continuous economic development in the world.

The problem of corporate governance is even more critical in transition economies, in particular in the countries of FSU, where the recent dominance of state ownership along with authoritarian-traditions of governance inherited from the past are currently in fight with modern styles of management coming from the West. The outcome of this fight determines the microstructure of industries as well as the

infrastructure in these countries. As a result, the level of corporate governance also influences the macroeconomic development (Zelenyuk and Zheka, 2006). In particular, by determining investor's rights the quality of corporate governance in these countries can partially explain the differences in investment inflows, and, consequently, countries' growth rates. In this respect, the Stiglitz (1999) critique towards transitional reforms is enlightening:

> "The divergence of interests between the managers and shareholders in large publicly-traded corporations has been a major source of the economics of agency contracts. Yet the hard lessons of the separation of ownership and control, and the resulting agency problems, have received insufficient attention in the standard western advice in spite of much discussion of 'the corporate governance problem.' … Privatization is no great achievement – it can occur whenever one wants – if only by giving away property to one's friends. Achieving a private, competitive market economy, on the other hand, is a great achievement, but this requires an institutional framework, a set of credible and enforced laws and regulations." (Stiglitz, 1999, p. 10, 19)

2.2. Related Literature

A large amount of literature studies the association between corporate governance and firms' performance or market value. However, many papers focus on *developed* countries and on *particular aspects* of governance (board composition and size (e.g. Bhagat and Black, 2002; Lehn, Patro, and Zhao, 2003), shareholder activism (e.g. Black, 1997 for a survey), CEO turnover (e.g. Gibson, 2002), executive compensation (e.g. Schmid, 2003), ownership structure, and takeover defenses). Much less research exists for *developing* countries (e.g. Black, Jang and Kim, 2004) and a few papers are done for *transition* economies (e.g. Радыгин, Энтов, 2001; Black, 2001; Zheka, 2005; Zelenyuk and Zheka, 2006)[2].

[2] For more detailed literature review on ownership impact on firm's performance, please, refer to Jensen and Meckling (1976), Shleifer and Vishny (1986, 1997), Zheng et al (1998), Brown and Earle (2000), Brown, Earle and Telegdy (2004), Kuznetsov and Muravyev (2001), Andreeva (2003), Zheka (2005).

Papers that investigate whether *overall* corporate governance predicts firm performance or market value is very limited. Some most closely related papers are Радыгин, Энтов (2001), Turuntseva, Woodward and Kozarzewski (2004), Black (2001), Durnev and Kim (2003), Zheka (2005), Zelenyuk and Zheka (2006) and Black, Jang and Kim (2004). Радыгин, Энтов (2001) and Turuntseva, Woodward and Kozarzewski (2004) use a range of governance indicators from survey data to build an index of corporate conflict (intensity) and relate it to companies' performance in Russia. They find correlation between corporate conflict index and performance, however they do not control for possible endogeneity of corporate governance. Black (2001) finds a strong correlation between Standard and Poor's index of corporate governance and the share prices of Russian firms. However he has a small sample of only 21 firms, very limited control variables, and he does not control for endogeneity. Zheka (2005) and Zelenyuk and Zheka (2006) investigate the association between some individual governance elements and index of corporate governance quality (constructed from five indicators of corporate governance) and firms' efficiency, applying various DEA methods, for a set of listed companies in Ukraine and find a positive correlation. However the main critique of these studies is also that they do not control for potential endogeneity problems.

Only two studies, Durnev and Kim (2003) and Black et al (2004) attempt an instrumental variable analysis to address an endogeneity problem. Durnev and Kim (2003) investigate the determinants of corporate governance in emerging markets and briefly address whether corporate governance quality predicts market value. They find that higher scores on corporate governance indexes (Credit Lyonnais Securities Asia (CLSA) and S&P disclosure indexes) predict higher Tobin's q for a sample of 859 firms in 27 countries. While the instruments used by Durnev and Kim seem to be suspect (since they assume that industry does not affect governance), Black et al using the specifics of the Korean legislation on corporate governance find relatively good instrument (asset size dummy variable for companies with

assets over 2 trillion won, because different governance requirements are applied to such companies) and use two-stage and three-stage least square analysis to address endogeneity in the cross-sectional data. They report strong evidence that overall corporate governance is an important factor in explaining the market value of Korean public companies.

3. Data and Measures of Corporate Governance and Performance

3.1. Sources of Data and Sample

Our data come from the *Istock* database of annual financial statements of Ukrainian joint-stock companies. *IStock* is the only in Ukraine modern centralized system of accumulation and disclosure of corporate information which is open and accessible for everyone. IStock was established by the leading stock market trading and information system PFTS, with assistance of FMI/USAID. This database provides annual financial statements in total for 14356 companies, in particular 2215 corporations in 1998, 8325 corporations in 2000 (out of 11850 registered), 7735 corporations in 2001 (out of 12039 registered) and 10213 corporations in 2002 (out of 12010 registered).

For the empirical testing we use the dataset of 10313 observations on manufacturing open joint-stock companies in total, in particular 4337 firms in 2000, 3385 in 2001 and 2591 in 2002. Thus the sample covers around 37%, 28% and 21% of all open joint-stock companies in Ukraine in 2000, 2001 and 2002 respectively. The data is collected from publicly available information, in particular, from annual financial statements of Ukrainian joint-stock companies (Source: PFTS – First Trading Stock System, *Istock* database: www.istock.com.ua).

The descriptions and descriptive statistics of available data are given in Table 2. Data covers enterprises of very different size: on average the annual total revenue of a company is about 18 million UAH and varies in the interval from about 5,000 UAH to 27 billion UAH. Enterprises come from all

oblasts of Ukraine and we classify them by four regions: west (20% of observations), east (28% of observations), center (34% of observations) and south (17% of observations).

The sample covers various business sectors and we distinguish it by the first two digits of industry code. In particular, companies in the sample come from such sectors as Services (12% of observations), Health and Tourism (0.3%), Utilities (1%), Agriculture (14%), Communication (0.07%), Construction (11%), Finance (0.1%), Industry (44%), Science (1%), Trade (5%) and Transport (11%).

We use method of Hadi (1992, 1994) for detection of outliers in terms of output, capital and labor in our sample. This method detected 1,734 observations as outliers that comprise around 16.82%[3] of the sample. The descriptive statistics for the set of outlying observations are given in Table 2B. The output (Net Revenue) of outliers varies from UAH 13,800 to more then UAH 5 billion with a mean of around UAH 94 million. Majority of outliers are detected in industry (72%), construction (7%), agriculture (7%), services (4%), trade (4%) and utilities (3%). We exclude these outlying observations from our estimation.

The descriptive statistics for the sample without outliers are given in Table 2C. As it was expected the mean of output in the sample after the outliers were dropped is considerably lower (around UAH 1.8 million) and varies in the interval from UAH 5,000 to about UAH 14 million.

[3] Hadi method was applied to the output, labour and capital variables in levels at 5% level simultaneously. We also used other formulations of Hadi procedure, i.e. only for output variable in levels at 1%, 5% and 10% significance level – identifying 8%, 10% and 11% of observations as outliers respectively. Hadi (1992, 1994) proposes a procedure that is effective in dealing with masking and swamping problems and successful in identifying multivariate outliers. Let X be an $n*p$ data matrix representing n observations on p variables. The n observations are first ordered using an appropriately chosen robust measure of outlyingness, then the data set is divided into two initial subsets: a 'basic' subset which contains $p+1$ 'good' observations and a 'non-basic' subset which contains the remaining $n-p-1$ observations. Second, the relative distance from each point in the data set to the centre of the basic subset, relative to the (possibly singular) covariance matrix of the basic subset is computed. Third, the n observations are arranged in ascending order and the data set is divided into two subsets: a basic subset which contains the first $p+2$ observations and a non-basic subset which contains the remaining $n-p-2$ observations. This process is repeated until an appropriately chosen stopping criterion is met. The final non-basic subset of observations is declared an outlying subset.

We also applied another method, which was used by Black et al (2004), to exclude outlying observations based on studentized residual. We treat observations as outliers if a studentized residual obtained by regressing *log(output)* on *UCGI* and a constant term exceeds ±1.96. A studentized residual of observation i is a residual obtained from a fitted regression line estimated without observation i divided by the standard deviation of residuals computed without observation i. This method detects around 5% of observations as outliers.

3.2. Notion of Corporate Governance Quality and Construction of Corporate Governance Index

A. Some General Comments

There is no one model of corporate governance that works in all countries and all companies. Indeed, there exist many different codes of "best practices" that take into account specific legislation, board structures and business practices in individual countries. Nevertheless, there are standards that can apply across a broad range of legal, political and economic environments. With this in mind, the Business Sector Advisory Group on Corporate Governance to the OECD has articulated a set of core principles of corporate governance practices that are relevant across a range of jurisdictions (OECD, 1999). These are Fairness, Transparency, Accountability and Responsibility.

Under the *quality of corporate governance* at a firm we understand the *extent* to which a firm adopts and conforms to guidelines of good practices of corporate governance *overall* (S&P, 2002). There is no corporate governance index (estimated by some rating agencies) available for the companies in our dataset, and one of the challenges is to obtain some appropriate set of indicators that would together give a reasonable estimate of real state of corporate governance at the firms. We determine the list of governance elements based on the OECD Principles of Corporate Governance (OECD, 1999), S&P Corporate Governance Scoring Methodology and other codes; and, of course, our list of corporate governance elements is also restricted by the availability of relevant information.

B. Selection of Corporate Governance Elements and Sub-indices

B.1. Previous Literature

In this part we provide the explanations regarding our choice of particular elements and sub-indices. There are two strands of literature in terms of choice of corporate governance measures: those that use governance measures constructed by some rating agencies (e.g. Klapper and Love (2002) use CLSA

scores, Durnev and Kim (2003) use CLSA as well as S&P's scores, etc.) and those that construct their own measures using a set of observable indicators (e.g. Black et al, 2004).

While the former measures usually include more comprehensive list of governance indicators, they also have serious potential problems. The CLSA measure is significantly impacted by analysts' subjective views, which could be biased by analysts' knowledge of stock returns. The S&P's measure used in other studies is limited to disclosure, which causes an omitted variable bias problem since disclosure closely correlates with other, omitted, elements of corporate governance (for evidence of this problem, see Black et al, 2004). Another problem is that the researcher is restricted to a particular sample of public companies for which the index was produced; usually the largest companies in the world. A rating agency spends vast resources in terms of time, labour and financial resources for creation of the index only for one company (e.g. construction of index by S&P's might take about a half of year for one company) and not all companies can afford it. Therefore the studies that use such measures cannot take into account the information on other public companies.

The advantage of the latter approach is that the researcher can choose the sample, carefully select the governance indicators and construct good objective measures of corporate governance; however usually in such cases a fewer number of indicators is available due to constraint in available resources.

B.2. Our Selection of Corporate Governance Elements and Sub-indices

In this study we follow the second approach constructing our own measures of corporate governance from selected indicators. We follow the approach of Black et al (2004) to group the individual elements into five sub-indices: Sub-index of Shareholder Rights, Sub-index of Transparency, Sub-index of Board Structure, Sub-index of Board Procedure and Sub-index of Ownership. We present our elements of corporate governance below, and the explanations regarding the way of construction and

potential problems in Table 1. The reliability of our corporate governance variables we discuss in Section 3.2.E.

Shareholder rights.

The major goal of corporate governance system is to ensure that corporation is working efficiently maximizing its value in the interests of it's financial stakeholders, and, in particular, shareholders. For example, it is important how the company treats minority shareholders that may not be able to protect themselves from expropriation of their rights by managers or large shareholders without legal interference.

Shareholder registrar. As summarized in the OECD Principles of Corporate Governance (see Table 11 Principle 1), one of the most basic shareholder rights is the right to reliably verify one's shareholdings. Under the current framework, only companies with more than 500 or more shareholders are obliged to use the services of an independent share registrar. Companies with fewer shareholders are permitted to maintain the register themselves, following procedures set by the Commission. Experience in Russia in the early 1990s and Tajikistan in 2000 shows that where company management has the only official copy of the share register, any disagreements between company management and shareholders may result in the shareholders finding that their shareholdings are no longer correctly recorded on the share register (Rutledge, 2002).

Regularity of general shareholder meetings. Some enterprises do not have regular shareholder meetings (at least, once a year); however, according to OECD principles, to participate and vote is one of the basic shareholder rights. In the two prominent cases on problems with quorum—Ukrnafta and Daewoo/WellCOM—the 40 percent shareholders boycotted the meeting. In both cases, the minority shareholders were endeavouring to obtain proportional representation on the company's supervisory board and thus, be able to influence the decisions by company management.

Extra shareholder meeting. On the other side if an extra shareholder meeting has a place during the year it might imply that shareholder meetings are indeed play an important role in firm's governance. Moreover it may indicate on "extra" shareholder activism. Shareholder activism is considered to be one of the most important factors that forces managers to make real changes at firm.

Transparency.

Transparency means accountability of company's management to its financial stakeholders. It involves the timely disclosure of adequate information concerning company's operating and financial performance and its corporate governance practices. The higher standards of timely disclosure and transparency a corporation has the more it enables shareholders, creditors and directors to effectively monitor the actions of management and the operating and financial performance of the company. Strong transparency means that financial reporting facilitates a clear understanding of a company's true underlying financial condition (S&P, 2002).

Presence of nominal shareholding. The nominee holdings in firm's ownership structure are used as instrument to avoid public disclosure of information on beneficial ownership. As a result one does not know a true shareholder but only the name of a financial institution representing its interests. As a result the ownership structure is not fully transparent, especially if nominal shareholdings create cross-holdings increasing the total shareholdings of some shareholder, etc. violating OECD Principle 4 in the part of transparency of ownership structure.

Company's website. Company's website might be an effective way of delivering company reports, summary reports and/or other investor relevant information available in English and the local language. Currently, creation of a web-site is inexpensive, but still only a few companies have done it—perhaps those companies that care about the transparency, communication, etc more than others. This variable is

used by S&P's and we use it as one of the proxies for transparency, OECD Principle 4. We note that we did not check the content of the websites, in particular if they in.

Timeliness of publication of annual financial statements. It was required by the Commission that companies published their annual financial statements within the nine months after the end of reporting year. We consider that timely publication and/or early publication is a plus to corporate governance system.

Publication of information on registrar. The public disclosure on registrar of company's shares is important for respecting shareholder rights. Shareholders have the right to check their ownership and whether it is properly registered in any time. According to OECD principle 4 this is material information that must be disclosed.

Publication of information on auditor. According OECD principle 4 an annual audit should be conducted by an independent auditor. We cannot check the independence of auditor but we can observe if company report information on its auditor, which is considered to be a material information and is subject to disclosure.

Recognized international auditor. If company's auditor is one of the five top world auditors, it would most probably indicate on better quality of disclosed information, which is important according to OECD principle 4. S&P's also takes it into account because they consider the reputation and independence of auditors from the board and management in all material respects.

Supervisory Board Structure.

The role of the corporate board is to provide independent oversight of management performance and hold management accountable to shareholders and other relevant stakeholders. Separation of authority at the board level is important. Boards with high accountability often include a strong base of independent outside directors that look after the interests of all shareholders – both majority and minority

holders. Conversely, companies with a strong, self-interested majority shareholder – or dominated by a few such shareholders – may have boards with limited accountability to all shareholders. This may be the case when the company's management is heavily represented on the corporate board (S&P, 2002).

Proportion of nonemployed directors. The board independence from managers is in the heart of current international debate on corporate governance. Independent or outside directors should ensure that the long-term interests of all shareholders are represented by including that the interests of other stakeholders are duly taken into account (S&P, 2002). We will try to proxy the independence of board by the proportion of unemployed directors while we recognize that we do not have information about true independence of directors, e.g. we do not know about possible family relationships, some business dependency etc. And we do not check any other information except the nonemployment of directors.

Supervisory Board Procedure.

Nonemployment of Chairman. We try to capture the independence of a board chairman from company's managers by this variable. The reasoning is similar to previous element. An independent chairman will provide better confidence that a board represents interests of all shareholders.

CEO/Chairman. For a long time the separation of CEO and board chairman responsibilities was a hot debate. When the same person is both the CEO and chairman it results in the conflict of interests. This may entail the lack of board independence to fulfill its guiding and controlling functions, and thus, it creates strong possibility for company's mismanagement. Existing research offers mixed evidence on the impact of CEO/Chairman issue on governance (see Gillan, Hartzell and Starks, 2003 for a discussion). In short, from one side separating the CEO and Chairman positions is in shareholders' interests, from the other costs of separating the CEO and Chairman positions may exceed the benefits. Others advocate designating a lead independent director instead of separating the two positions.

Ownership Structure.

This is the most difficult part of our overall corporate governance measure. We decided for the incorporation of ownership structure into corporate governance index because of several reasons. First, we consider it as an integral part of corporate governance process. In many studies (e.g. Shleifer and Vishny, 1997) it is shown that in the countries with relatively weak investor protection there is tendency to more concentrated ownership, because large shareholdings allow investors more easily protect their rights, e.g. by dismissing a management. We recognize that ownership structure bears also other information (e.g. knowledge and technology transfer, etc), thus using information on private and dispersed ownership we try to capture only those effects that are related to corporate governance. Second, it is a common practice to include ownership in previous literature, e.g. Black et al, 2003 use ownership parity index, Durnev and Kim (2004) use ownership wedge based on the difference between control rights and cash flow rights. We do not possess the similar information used in these studies and we attempt to construct our own ownership measure as defined below.

Private Ownership. Private owners have more incentives and power to control management while state ownership usually suffers from poor governance. In transition context large state share of ownership at a firm also might often indicate that old management is still in place and old (soviet-age) management style prevail.

Absence of controlling shareholder. While many believe and it is empirically shown for transitional economy (e.g. Andreeva, 2003) that presence of large shareholder improves performance, large shareholder has incentives and much more power to expropriate rights of other shareholders (Akimova et al, 2004; Hart, 1995), especially in the context of weak legal protection of shareholder rights. Thus we expect the presence of controlling shareholder negatively affect governance quality. Controlling shareholder is often able to directly influence the managers and their performance; thus leaving less place for the importance of other governance elements.

C. Construction of Corporate Governance Indices

Each element other than the board independence and private ownership is a 0-1 dummy variable that indicates on the presence of a particular governance element at a firm. Board independence and private ownership are continues 0-1 variables.

To compute multi-element sub-indices we sum a firm's score on the elements of each sub-index, divide by the number of elements, and multiply this ratio by 20; eliminating observations if information for at least one element (we lack the information on board arrangements for about 7,000 firms) is not available (to avoid omitted variable bias). For the Sub-index of Supervisory Board Structure we multiply the percentage of unemployed directors (as a fraction between 0 and 1) by 20. In this way we obtain five sub-indices: Sub-index of Stakeholder Rights (three elements describing registrar independence and shareholder meetings), Sub-index of Transparency/Information Disclosure (six elements describing the content of annual financial statements, transparency of ownership structure, publication of annual financial statements etc), Sub-index of Supervisory Board Structure (the percentage of unemployed board directors), Sub-index of Supervisory Board Procedures (employment of board chairman and separation of responsibilities of board chairman and CEOs) and Sub-index of Ownership Structure (share of private ownership and absence of controlling shareholder). Each sub-index has a value between 0 and 20.

We define *overall* Corporate Governance Index (*UCGI*)[4] as the sum of the sub-indices. Thus it has a value between 0 and 100, with better governed firms having higher scores. Its value for each

[4] A multifactor index is important in avoiding omitted variable bias. For example, quality of disclosure correlates strongly with other aspects of corporate governance; and if other governance elements are included as additional independent variables, the power of a disclosure element declines (e.g. in Black et al, 2004).We lack a theoretical basis to assign weights to different indicators. We therefore use different approaches to construct the index. First, we assign equal weights to all elements. Second, as a robustness check, we use the Principal Factor Analysis (PFA) to determine the appropriate weights for each element and then for each sub-index based on the degree of communality.

corporation allows judging about the extent the firm adheres to local standards of corporate governance; though our goal is not to consider particular case but rather an overall tendency in the population.

D. Descriptive Statistics for Governance Elements, Sub-indices and Overall index, UCGI

Table 3 presents the descriptive statistics for individual governance elements. Around 93 % of firms do report on their registrar in the annual financial statements; and 95% of firms have an independent registrar. 95% of firms provide information on their auditor while the other 5% do not report any information on their auditor and whether their financial statements were audited or not.

Surprisingly only 64% of firms in our sample had a mandatory annual general shareholder meeting; and around 2% had an extra shareholder meeting. About 70% of firms published their annual financial information in the press timely; and only 1% of companies in our sample have their own website.

In 59% of observations the Chairman of Supervisory Board is not employed at the company that he serves as a chairman. On average 51% of board directors in our sample are unemployed at the companies they serve as directors. And only in 5% cases one of the company's CEO is also the Chairman at this company.

About 90% of the companies' shares in our sample (after eliminating outliers) belong to private persons; the other 10% belongs to state. For around 4.4% companies in our sample we have at least one nominal shareholder in the company's ownership. And in 78% of companies we do not have a controlling shareholder.

Figure 1 shows a histogram of overall corporate governance index, *UCGI*. A normal distribution curve is superimposed. The descriptive statistics for overall corporate governance index and for each

sub-index are given in Table 4A. The mean of overall index is 62.24 and it varies from the minimum of 20 to the maximum of about 94.

Table 4D provides a correlation table for *UCGI*, each sub-index, log(output) and each of our instrumental variables. Majority of coefficients for corporate governance index and sub-indices (9 out of 15) are positive and significant. The correlation coefficients between Ownership Sub-index and two board sub-indices are negative and significant, implying that there is some association between more independent boards (and chairmen) and presence of controlling shareholder and more state ownership. This is consistent with the agency problems associated either with dispersed ownership in weak legal environment or state ownership – in both cases we observe less independent boards on average. Table 4C provides a full correlation table for each governance element and log(output). Majority of significant correlations are positive, however there are also some significant negative correlations. All elements (but one) appeared to have significant correlations with output; and all significant elements (but two) have positive correlations.

E. Reliability of our Corporate Governance Variables

We believe that our measures of corporate governance are strong proxies of state of corporate governance quality at a firm. Though one might question the reliability of our governance measure since we indeed cannot boast about the comprehension of the list of governance elements we use (for comparison, see Part 3.B. for our elements and Table 11 for OECD Principles of Corporate Governance). Our response to this is as follows. First, we still have a number of governance indicators that proved to be highly important in previous literature and international practice (see description of corporate governance elements at Table 1). They give enough information for one to differentiate the

enterprises across quality of corporate governance and judge on better or poorer corporate governance at particular enterprises (see descriptive statistics at Tables 3 and 4).

Second, our governance elements represent all aspects of firm corporate governance (not only some particular aspect), namely shareholder rights, disclosure, board and ownership (see Table 1). Thus if they are grouped accordingly they give one a measure of the extent the company follows sound corporate governance principles in each of the aspect of corporate governance.

Third, it is reasonable to expect that firms that are good in the observable (to us) governance elements are most likely good also in other thing; as in famous Biblical proverb (NIV, Luke 16:10): "Whoever can be trusted with very little can also be trusted with much, and whoever is dishonest with very little will also be dishonest with much."

And, fourth, we recognize that our indices of corporate governance quality may suffer from error-in-variables problem since we use proxy variables in place of unobservable variable, corporate governance quality, suggested by economic theory (Kennedy, 1998). The problem is that errors in measuring corporate governance variables make our corporate governance measure stochastic; the seriousness of this depends on whether or not this regressor is distributed independently of the disturbance. Because this measurement error appears in both our corporate governance variables and the disturbance term, the estimating equation has a disturbance that is contemporaneously correlated with corporate governance variable. We address this problem with instrumental variable analysis, introduced in the Section 3.3.

3.3. Instrumental Variables for Corporate Governance

A. Preliminary Comments on Potential Econometric Problems

If there is a correlation between firm's performance and its quality of governance, next question arises: Do better governance practices cause firms to perform better? Or, in other words: Do good governance

practices help in solving principal-agent (and principal-principal) problems and preventing mismanagement? Several alternative explanations are possible (Black et al, 2004). First, in a reverse causation story, firms with higher performance are more likely to adopt better governance practices in order to further improve their performance. Causation would then run partially from performance to quality of corporate governance. There will be a causal relation between corporate governance and performance but OLS coefficient will overstate the relation. Second, it is a quality signaling case; firms conforming to good corporate governance practices 'behave' well to signal high quality. But it is the signal that affects performance rather then governance standards. For example, firms could formally conform to high local standards of disclosure and other Commission requirements (which we predominantly capture by our measures of corporate governance) to signal the management's intent to be accountable and transparent to shareholders and other potential investors, even though the disclosed information in fact does not contain all important issues that might affect the behavior of shareholders. There will then be correlation between governance and performance but no causal connection; governance would proxy for an omitted variable – the management's intent. Third, in the optimal differences case of endogeneity, different firms optimally adopt governance practices based on their specific needs. For example, well-performing firms on dynamically developing markets may adopt good governance standards to ensure their ability to enter international capital markets in the future. In this case there might not be causal relation between corporate governance and performance at least at present, but OLS results will overstate the connection. A fourth explanation is an omitted variable problem. Both corporate governance and performance are likely to correlate with many other economic variables and if we do not control for this possibility either by controlling for these variables or in other way we could wrongly conclude the significant direct relation between governance and performance.

Other governance studies find controversial empirical evidence on endogeneity. For example, Bhagat and Black (2002) and Erickson, Park, Reising and Shin (2003) report the reverse causation running from firm market value to board independence. At the same time Black at al (2004) and Gillan, Hartzell and Starks (2003) find no significant endogeneity problems for the relation between governance and Tobin's q in their studies.

In our empirical investigation we address the potential econometric problems in a number of ways. First, we use extensive control variables to make optimal differences problem to be less likely important. Second, we use models with fixed effects transformation to eliminate all time-invariant firm characteristics such as managerial ability, owner specifics etc. Third, we use instrumental variables analysis. Identification of appropriate instruments is not trivial in corporate governance literature. The valid instruments should be exogenous and not be influenced by the company performance. It is desirable that the instruments are strongly correlated with the corporate governance measure. And it should influence the dependent variable (in our case, firms performance) only through its effect on corporate governance variable and not directly.

Up to our knowledge *the only* paper that finds relatively good instrument is Black et al (2004). They use specifics of Korean legislation, which applies different governance requirements to companies based on the size of their assets, to define asset size dummy as an instrument. The other studies lack of appropriate instruments.

A core contribution and the novelty of this study is that we use literature that studies notion of trust to construct as we believe very strong instruments for corporate governance index and sub-indices. In the remainder of Part 3.3., we discuss the plausibility of our instruments.

B. Trust Determinants as Instruments for UCGI and Sub-indices

The trust literature is relatively young field in economics and has been growing rapidly during last years especially boosted by study of Putnam (1993). Putnam showed how the concept of social capital can be used in quantitative analysis of different economic and social issues. More recent literature (Uslaner, 2002) started distinguishing different elements of Putnam's social capital, in particular stressing the role of social trust. Substantial recent literature established a significant relation between social trust and many other economic phenomena, such as economic growth, the rule of law and overall governance, corruption, education, etc. (see Bjornskov, 2005 for more detailed references).

From the other side there emerging a literature that treats trust as a strategy to resolve the agency problems that occur within the firm. Chami and Fullenkamp (2002) develop a model of trust and show how trust resolves the agency problems and increases firm efficiency. As Chami and Fullenkamp (2002) cite, in 1975 Nobel Laureate Ken Arrow wrote "It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence." Interestingly, Arrow cite mutual confidence—trust—rather than technology, natural resources, or some other input as being essential to the development of an economy. Fukuyama (1995, 2000) has argued that trust improves the performance of all institutions in a society, including businesses. La Porta et al (1997, 1998) has found that trust promotes cooperation in large organizations. Importantly, the paper by Chami and Fullenkamp (2002) as well as the findings of other researchers suggest that building trust into the culture of economic and government institutions is an important and productive approach at the micro level.

In this framework we propose to use the determinants of trust as instruments for corporate governance quality at a firm level. We believe that level of trust affects performance of a corporation through its effect on the choice of corporate governance practices. For example, managers will disclose more information about a firm if they believe that the disclosed information will not be used against them. Or, the managers might be ready to disclose more information on problems a company face if they

trust the investors will not leave a company. In particular, this idea was inspired by working paper of Christian Bjornskov (2005) who discusses among the determinants of trust and explains the effects of such factors as political diversity, religion and ethnic diversity. We adopt the ideas in the Bjornskov paper to our case and use the regional variation (and time variation for religion) to construct three instrumental variables. Ukraine has 24 regions. First, political factor is the probability that two randomly chosen people in particular region voted for different candidates during the last round of recent presidential elections in 2004[5]. Second, religion is the number of Christian churches of all denominations across regions and years[6]. Third, ethnic diversity is the probability that two randomly chosen people from a region are of different nationality[7].

We also define fourth instrument, the method of privatization[8], which seems to be a relatively good instrument since most firms were privatized at least 3-4 years (see more information on years of privatization at Table 4B) before the period under analysis and it may hardly influence performance at the moment, while it still shall affect the quality of corporate governance due to specifics of privatization. In fact we come to the instrument with only one method of privatization, in particular by sale of shares (67% of firms); since the second method has very little variation (see descriptive statistics below, about 1%). Interestingly we do not know the 'origin' of 32% of firms in our sample; it might be either new enterprises or those that initially were privatized in other form of business (not as joint-stock company, JSC). In both cases these 32% of firms seem to be totally different from others, privatized as JSC, since they voluntarily have chosen to be a JSC – thus, they perhaps are more interested in the advantages of a JSC form of business and consequently they shall practice better governance. The

[5] Source: official government website of Central Election Committee, http://www.cvk.gov.ua
[6] Source: official statistics, http://www.risu.org.ua/eng/resources/statistics/
[7] Source: official statistics of Ukrainian State Statistics Committee, http://www.ukrstat.gov.ua.
[8] Source: the data on methods of privatisation of joint-stock companies were kindly provided by officials of Ukrainian State Property Fund.

validity of this instrument is also confirmed by orthogonality tests as we will discuss it in more detail later.

The descriptive statistics for the instruments are given in Table 4B. The mean of political and ethnic diversity is 0.1593 and 0.1302 respectively and it varies from 0.0381 and 0.0215 to 0.2498 and 0.2453 respectively. The average number of churches in the region is 1,084 with a minimum at 565 and maximum of 2,813. Around 67% companies in our sample were privatized by sale of shares, about 1% by repurchase. The rest 32% of companies we believe are either new companies or they became joint-stock company after privatization; we actually do not know the history of these enterprises.

The correlation table for the instruments and corporate governance index/sub-indices is given in Table 4D. Almost all correlations are significant although with different signs.

3.4. Comment on Performance Measurement

Corporate governance is usually analyzed in a framework of its relation to some measures of *market value* of a firm (the issue that investors are interested in). In this study however we follow a different approach – we relate governance measures to 'net revenues' in a framework of standard production function. The main reason is the high *rigidity* of Ukrainian *stock market* when it is not possible to determine the *market value* of companies. We investigate the relationship between the degrees to which a company follows sound corporate governance practices and the company's *performance/efficiency*. Such analysis allows us to look at the root of the corporate governance problem – an inefficient usage of resources – usually not easily observable by outsider such as investor, shareholder, government etc. Referring to the theory of *value creation* (Copeland, 2000) we can argue that corporate *value* and corporate *performance* should go together. Therefore, investigating the association between corporate governance and efficiency can to some extent even predict the link

between corporate governance and corporate value in a situation when corporate value is not observable, as it is currently the case in Ukraine.

4. Hypotheses and Methodology

4.1. Hypotheses

In evaluating the link between the quality of corporate governance and efficiency of enterprises, our Main Hypothesis is**:** '*There exist a positive relationship between the overall corporate governance quality and firm's performance'.* In order to enrich the policy implications we also investigate the importance of separate elements and sub-indices of corporate governance as defined earlier. We expect the sub-indices to positively affect performance.

The hypotheses may seem unquestionable, yet firms in transitional economies do not exhibit high levels of corporate governance and up to now there have been no convincing evidence for Ukraine or other transitional economy that firms with good corporate governance are performing better[9]. There is also no evidence for the effects of sub-indices on performance in transitional context.

We will also control for comprehensive list of other factors that we expect influence firm's efficiency, including the year, region and industry specifics, with which we expect to capture the effects of the level of competition, government subsidizing etc.

Certainly, any of these hypotheses may not be true for a particular enterprise and our goal is to investigate the overall tendency in the population, using the sample we have and the methods we describe below.

4.2. Methodology

[9] Exception is the study of Zheka (2005) and Zelenyuk and Zheka (2006). This paper extends the previous studies in a number of ways, e.g. we use much larger sample, richer list of corporate governance variables, control for firm effects and for potential endogeneity.

In this study we use parametric approach, i.e., standard 'averaging' production function (SPFA) estimation. We use this approach because it permits much more easily to address important econometric problems that often arise in research of corporate governance, notably endogeneity. And we will also use DEA/SFA approach because it permits to directly measure the efficiency scores, levels of resources utilization, and analyze their determinants (in contrast to the analysis of determinants of output variable in SPFA) as well as because of its growing popularity and good reputation in top journals in the world. DEA could be especially interesting if no significant endogeneity is detected as it is a case in many other studies (e. g. Black et al, 2004; Gillan, Hartzell and Starks, 2003).

Standard Production Function Approach

A general form of specification we estimate is as follows (Wooldridge, 2002),

$$y_{it} = \mathbf{z}_{it}\gamma + \mathbf{w}_{it}\delta + c_i + u_{it}, \qquad (1)$$

where i=1,…,I represents I companies, t=1,…,T represents T time periods;

c_i is the unobserved firm effect and u_{it} are the idiosyncratic errors, y_{it} is the ln(output), of firm i, $\mathbf{z}_{it}$ is a set of strictly exogenous variables, such as capital stock, employment etc for firm i in the sense that

$$E(\mathbf{z}_{is}' u_{it}) = 0, \text{ for all } s, t \qquad (2)$$

that we expect to influence firms' output through the vector (set) of parameters γ.

$\mathbf{w}_{it}$ is a corporate governance index (or a set of corporate governance elements) that we expect to influence firms' output through the vector (or set) of parameters δ, which we aim to estimate. To model possible endogeneity we allow $\mathbf{w}_{it}$ to be *contemporaneously* correlated with u_{it}. This correlation can be due to any of the three problems: omission of an important time-varying explanatory variable, measurement error in some elements of $\mathbf{w}_{it}$, or simultaneity between y_{it} and one or more elements of $\mathbf{w}_{it}$.

We assume that equation (1) is the equation of interest. In a simultaneous equation model with panel data, equation (1) represents a single equation. A system approach is also possible.

This equation has a causal interpretation: holding fixed the factors in $\mathbf{z}_{it}$ and c_i, it models the effect of an exogenous change in the quality of corporate governance on output. Thus, equation (1) is a structural equation.

The presence of the firm heterogeneity, c_i, in equation (1) recognizes that corporate governance might be correlated with firm characteristics, such as owners specifics, managerial ability etc that also affect performance. An additional problem is that corporate governance might also be correlated with u_{it}. This correlation could be from a variety of the sources, one possibility is that firms may endogenously and optimally choose different governance practices (optimal differences bias) (Demsetz and Lehn, 1985; Black et al, 2004). Therefore we might add another equation to equation (1) that model dependence of corporate governance on some factors. Since equation (1) is of interest we do not need to add equations explicitly, but we must find appropriate instrumental variables.

To get an estimable model we will first use the fixed effects (FE) or first differencing (FD) transformations to eliminate c_i before addressing the correlation between $\mathbf{w}_{it}$ and u_{it}. From differencing equation (1) we get

$$\Delta y_{it} = \Delta \mathbf{z}_{it} \gamma + \Delta \mathbf{w}_{it} \delta + \Delta u_{it} \qquad (3)$$

In case of FD we can use the entire vector $\mathbf{z}_i$ (industry sector etc) as valid instruments because $\mathbf{z}_{it}$ is strictly exogenous. However, if $\mathbf{z}_i$ is the only valid set of instruments for equation (1) the analysis probably will not be convincing: it relies on $\Delta \mathbf{w}_{it}$ being correlated with some linear combination of $\mathbf{z}_i$ rather then $\Delta \mathbf{z}_{it}$. Such partial correlation might be small, resulting in poor IV estimators.

One of the ways that will be used for obtaining additional instruments is to follow the standard simultaneous equation models (SEM) approach (Wooldridge, 2002): use exclusion restrictions in the

structural equations. For example, we can hope to find exogenous variables that do not appear in (1) but that do affect corporate governance. Later we discuss the instruments we use in this study.

If equation (3) is identified for each t we will estimate it using a pooled 2SLS analysis, while correcting standard errors and test statistics for heteroskedasticity or serial correlation. It could also be possible to use GMM system procedure that exploits general heteroskedasticity and serial correlation in Δu_{it} instead.

5. Preliminary Results: OLS

5.1. OLS Results

Results of OLS regressions with robust standard errors of logarithm of Net Revenues on our overall corporate governance index, *UCGI*, and the set of control variables excluding the outlying observations are presented in Table 5A. We call it our base OLS regression. The coefficient for our *UCGI* is highly strong at 0.0051 (z=5.46)[10] and it predicts that one-point-increase in our overall corporate governance index would result in around a half-percent increase in net revenues; and worst to best change in our overall corporate governance index predicts about 40% increase in company's net revenues.

In Tables 5A and 5B we also present results of OLS regression for the sub-indices of corporate governance. Three sub-indices, Sub-index of Shareholder Rights, Sub-index of Transparency, and Sub-index of Board Structure (fraction of unemployed directors) are highly significant in all regressions with robust standard errors at 0.0112 (t = 3.43), 0.0392 (z=7.70) and 0.0100 (z=5.88) respectively.

Interestingly, the coefficient for the Sub-index of Board Procedure has negative sign and is marginally significant, implying that if the company's board chairman is not employed at the company (if he is not either one of the executives or employees) it is negatively associated with performance.

[10] If outliers are included the *UCGI* remains strong at 0.0057 (z=6.47).

Ownership Sub-index is not significant mainly because its components (private ownership and absence of controlling shareholder) are related to performance with the opposite signs. Other control variables, capital, labour, majority of industry dummies, year dummies, regional dummies and Reduced indices of corporate governance are significant in all specifications.

In Table 5C we present OLS regression results for individual elements of corporate governance that are used to construct the indexes. All coefficients (but one) are significant. Only one element, indicating whether the responsibilities of CEO and the Board Chairman are taken by one person, appears not to be significant in all regressions. All but 3 of the elements have positive signs. While presence of controlling shareholder is well-expected to be positively related to performance, the negative coefficients for registrar variables (reporting information on registrar and independence of registrar) we cannot explain.

Importantly, the coefficients without control for the reduced index (the rest of corporate governance) often overstate the significance and size of relationship for sub-indices as well as for individual elements, especially e.g. for board and ownership elements.

5.2. Why to Aggregate into Overall Index?

One might ask a question: Why to aggregate the elements and sub-indices into *overall* corporate governance index. There are a number of reasons to justify the aggregation.

First, one of our goals is to measure *overall* level of corporate governance quality at a firm (in terms of international standards) and its effects on firm's performance, even if some of the elements have detrimental effect on enterprise performance. A separate task is to analyse the relative importance of individual elements and sub-indices in terms of firm's performance.

Second, omitting one or several important elements of corporate governance might entail measurement error in our corporate governance variable. This in its turn might be a source of endogeneity in our models.

Third, the reduced indexes in Table 5B and 5C are statistically strong in all cases implying that the power of corporate governance index comes more from aggregating a number of governance measures than from the power of one or a few governance elements. This might also indicate that the power of corporate governance index is not sensitive to how the index is constructed.

Fourth, availability of one single measure of corporate governance quality allows us more easily use instrumental variables analysis to address econometric problems; existence of more than one index/element requires more and better instruments.

5.3. Board Independence and Chairman/CEO Issue

A presence of independent directors (and preferably the majority of independent directors) as well as separation of responsibilities by company's CEO and Chairman are two issues that are in the centre of current international debate on corporate governance. Yet the empirical evidence on the effects of these two issues on performance for developed countries is mixed (see for a discussion, Black et al, 2004). The only paper we found that documents a powerful connection between board composition and firm market value is the study by Black et al (2004) on Korean listed companies. We have not found previous empirical evidence on whether firms with more independent directors perform better in the context of transitional countries.

Thus, our results for board composition and procedure deserve special attention. They represent the first attempt, to our knowledge, to empirically investigate the relevance of internationally important issues, board composition and CEO/Chairman issue, in *transition* context. In Table 5C the percentage of

unemployed directors takes a coefficient of 0.1357 (z=4.09) with all control variables but without control for the rest of corporate governance index, which corresponds to the way the literature on board composition usually address the issue. The coefficient remains strong at 0.0828 (z=2.28) if we control for the rest of the corporate governance index. We also test if 50% of unemployed directors at a firm is associated with better performance controlling for other all factor; the coefficient is strong at 0.1081 (z=4.40) and if controlling for other corporate governance elements at 0.1101 (z=4.49).

Our analysis provides the first strong evidence that board independence is important and relevant in a transition market. This result is well expected from theory because outside directors may be enough independent from management of a company to control self-dealing by insiders. Thus this provides an additional evidence for Black et al (2004) argument that board independence matters more if overall legal environment is weaker.

Surprisingly we do not find the positive effect of separation of responsibilities by CEO and Board Chairman on performance. On the contrary we document the evidence that if the Chairman is not either also the CEO or at least employed at the company then it might have a detrimental impact on performance. In particular, the coefficient for CEO/Chairman issue is marginally significant at -0.0979 (z=-1.89) if we control for the rest of the corporate governance index (insignificant if no control for the rest of the index). The coefficient for whether the Chairman is unemployed is significant at 0.0533 (z=2.17), but the significance disappears if we include the control for the rest of the index in our regression, with coefficient at -0.0461 (z=-1.56).

Possible explanation to this phenomenon might be related to the inability of *nonemployed* chairman to get access to timely and accurate information regarding business of a company and/or the lack of communication between chairman and company's management and inability of unemployed chairman to exercise his power appropriately.

6. Preliminary Results: 2SLS and 2SGMM

Instrumental variable analysis is a powerful method for dealing with many econometric problems, notably endogeneity, which often matters in studies of corporate governance. Moreover availability of appropriate instruments also allows one to analyse and test the model for significance of endogenous effects. As we discussed in part 3.3., we use four instruments, political diversity, religion, ethnic diversity, and method of privatisation, to instrument our corporate governance variable. The correlation table, Table 4D, shows that all correlations between instrumental variables and overall corporate governance index are significant, even though with different signs. Only one instrumental variable, method of privatisation by method of repurchase of state property after leasing, appear not to be significantly correlated with overall corporate governance. However in subsequent analysis we exclude this variable from investigation since it has low variation as well as it fails orthogonality tests. Most of all other correlations, between instrumental variables and the sub-indices, are also significant.

In Table 6 we present regressions that analyse the dependency of overall index and sub-indices of corporate governance on our instrumental variables with inclusion of all other control variables. We observe significant relationship between our instrumental variables and sub-indices; and different instruments are strong determinants of different sub-indices. We see a significant relation between Shareholder Rights Sub-index and all instruments; however for Political Diversity the significance is marginal. Transparency Sub-index is significantly predicted by Religion, Political diversity and Ethnic diversity. Two instruments, ethnic diversity and method of privatisation significantly affect board independence. Two instruments, ethnic diversity and political diversity are significant predictors of chairman independence. And political diversity as well as method of privatisation is the predictors of ownership sub-index.

In Table 7 we use instrumental variable analysis to test our hypotheses in the context of possible endogeneity. We use four instrumental variables: political diversity, number of churches, ethnic diversity and dummy for method of privatisation by sale of shares. In particular in columns 1-2 we present estimation results for first and second stage respectively of two-stage least squares (2SLS) estimation including all other control variables. Our overall index of corporate governance, *UCGI*, is statistically highly significant at 0.0051 (z=5.80). Pagan-Hall IV heteroskedasticity test (using levels of IV only) rejected the null of homoskedastic disturbance (see test statistic in Column 2 Table 7) and we use two-stage GMM to control for heteroskedasticity. We present 2S GMM regression results in columns 3, 4 of Table 7 for both stages. All other control variables are the same. *UCGI* remains highly significant at 0.0051 (z=5.65). In comparison with our base OLS results, *UCGI* coefficients are larger in instrumental variables regressions; however their power is lower as expected.

Validity of Instruments. Our instruments are very strong (religion at 0.0013 (z=3.70), ethnic diversity at 13.5619 (z=4.26) and privatisation at 1.5088 (z=4.75)) in explaining overall level of corporate governance; only one coefficient is insignificant (for political diversity at -3.3371 (z=-1.16)) in our GMM regression. Sargan test in 2SLS and Hansen J test in 2S GMM fail to reject the null of validity of instruments (p-values = 0.4470 and 0.4857 respectively). This gives us even more confidence that our instruments are valid[11].

Endogeneity of Corporate Governance Index, UCGI. Tests of exogeneity cannot reject the null of exogenous *UCGI*. The *C* statistic of *UCGI* is 1.972 (Chi-sq(1) P-val = 0.1602).

[11] We note that if we include fifth instrumental variable, dummy for the method of privatisation by repurchase of enterprise after leasing, it fails the orthogonality test; thus we exclude it from our instrumental variable analysis. Another possible instrument we considered is the asset size dummy for the firm's assets above 20,000 Untaxed Minimum Personal Wages (340,000 UAH). This potential instrument comes from the different requirements regarding annual reporting, stipulated by the State Commission on Securities and Stock Market. If the balance of the company on the end of the year is less then 20,000 Untaxed Minimum Personal Wages (340,000 UAH which is about 64,151 USD), then the company submits the annual report in simplified form (some info is not required). However this instrument also failed the orthogonality test.

Importantly, we also tested our hypotheses using corporate governance index modified in the following way. To compute the overall index we sum a firm's score on the *non-missing* sub-indices of an overall index and divide by the number of *non-missing* sub-indices; instead of eliminating observations with missing values. This procedure allows us to increase the number of observations to 18,275 observations; however the overall corporate governance index does not include all elements of corporate governance for 8,067 observations, which lack information on board independence and CEO issue. Thus, such procedure allows us substantially increase the size of our sample. The estimation results were as follows (tables are not shown). First, OLS regression with robust standard errors (specification is similar to our base model) coefficient for overall corporate governance index is strong at 0.0045 (z=6.18). Second, in IV framework we had to exclude one instrument, in particular method of privatisation. If it is included, the null hypothesis of valid instruments (*Sargan* test) is rejected. The method of privatisation is the first suspect of not being orthogonal to error term; and this is confirmed by orthogonality test (*C* test). Thus in IV analysis we used three remaining instruments, the factors of trust. The coefficient for overall index of corporate governance is very strong at 0.0763 (z=4.78). Sargan statistic (overidentification test of all instruments is not significant at 4.510 (P-value=0.1049) and *C* test of the null that corporate governance index is exogenous is not significant at 0.063 (P-value=0.8016).

The results with modified index confirm the robustness of our results of strong predicting power of corporate governance measure.

Endogeneity of Labor. We also tested whether our proxy for labour, *lnlabor*, is endogenous or exogenous in our model. According to *C* statistic we cannot reject the null that our labour variable is orthogonal (exogenous) (p-value = 0.7196 and 0.7190 for both models 2SLS and 2S GMM respectively).

Outliers and Influential Variables. Description of the methods that are used for detection of outliers is provided in footnote 3. When Hadi method is applied to identify outliers and influential variables only in terms of output in levels at 1%, 5% and 10% significance level, 8%, 10% and 11% of observations are treated as outliers respectively. The *UCGI* coefficient is significant at 0.0276 (z=2.10), 0.0291 (z=2.20) and 0.0274 (z=2.17) respectively.

We also applied another method, which was used by Black et al (2005), identifying outlying observations based on studentized residual. This method detects around 5% of observations as outliers. The *UCGI* coefficient appears to be highly significant at 0.0719 (z=3.70) given we excluded two most suspect instrumental variables (method of privatisation and election results) since otherwise instruments fail the validity test.

We also note that we attempted other Hadi procedure formulations to identify outliers. If smaller number of observations are excluded (e.g. 1% of the sample if variables are taken in logs as they used in estimations) as outliers, our instruments appear not to be valid, and we have to exclude the most suspect ones to 'achieve' validity.

7. Preliminary Results: Panel and Panel IV Regressions

In this section we present the results obtained from exploiting the *panel* characteristics of our sample: our data cover three years, 2000-2002. This opportunity partially comes from *transition* context of the economy, where one can observe changes at much more attractive speed than in the economies close to a steady state. We have enough variation in our corporate governance variables as well as in one of the instrumental variables (religion) to allow us instrumental variable analysis with panel data (in particular, with within transformation).

The use of panel and panel IV analysis is an important strength of our paper. Even in the only paper to our knowledge that uses relatively good instrumental variable of Black et al (2004), the authors have only cross-sectional sample. Some other studies find it problematic to use panel data due to e.g. low variation in corporate governance measures in developed economies.

In Table 8 we present results for both fixed-effects and random-effects estimators including all other control variables. Both estimates of coefficient for corporate governance are very strong; for fixed and random effects at 0.0052 (z=4.68) and 0.0047 (z=5.53) respectively, which is similar result to our OLS estimates.

In Table 9, we add instrumental variables analysis to our panel estimators and present the results for both stages. In fixed-effects IV estimator we use only one instrument, religion, since it is the only time-varying instrument; others are time invariant. In both specifications *UCGI* is statistically highly significant at 0.0525 (z=5.71) and 0.0487 (z=3.44) for fixed and random IV estimators respectively.

8. Principal Factor Analysis

In previous estimations we used equal weights to combine the individual corporate governance elements into sub-indices and overall index. In this section we use Principal Factor Analysis (PFA) to analyse the relative importance and communality of corporate governance elements before combining them. While the PFA produces qualitatively the same results as previous estimators, we would not use it as our base model due to the number of reasons: (i) as it is shown in Table 4D the correlations among the corporate governance elements are very low (however significant) with majority of correlations below $\left|0.1\right|$ with a maximum at 0.19; (ii) after PFA our corporate governance elements retained in itself the major part of their variation as it is shown by the coefficients in last column named "*Uniqueness*" of Table 10A on Factor Loadings; thus we believe PFA was unable to utilize the major variation of corporate governance

elements into the produced principal factors; (iii) it is quite difficult to find appropriate way for combination of elements and then to interpret the results of analysis. Nevertheless we present the results of PFA analysis for reference.

In this section we present the result of analysis after pooling all corporate governance elements for iterated PFA[12]. Iterated PFA allows us to re-estimate the communalities until we extract maximum communality. Based on the sizes and graph of eigenvalues it would be reasonable to use four components at most; there are significant drops in eigenvalues after 1st, 2nd and 4th components. 1st factor takes proportion of 0.4616 of common variation and includes three main elements (based on the loadings): CEO/Chairman issue, unemployment of Chairman and percentage of unemployed directors; we name this 1st factor as Supervisory Board Sub-index. 2nd factor covers the other proportion of 0.2522 and includes the following three main elements: availability of information on registrar and auditor in annual financial statements, and publication of annual financial statements; we name this 2nd factor as Transparency Sub-index. 3rd factor captures the other proportion of 0.1245 variation and the following elements: general shareholder meeting, extra shareholder meeting, as well as publication of annual financial statements and availability of company's website; we name this 3rd factor as Shareholder Rights Sub-index. It is difficult to interpret the loadings of 4th factor; thus we drop it from our subsequent analysis.

After scoring, i.e. generating a set of new variables that are estimates of the factors, we use regression analysis to determine the connection between these estimates and our dependent variable, *Net Revenue*.

[12] We also applied PFA (results for this PFA are not presented) to the elements of corporate governance *within the sub-indices* and the resulted weights (scores) were used to construct these sub-indices. Then, PFA was applied to the sub-indices to determine the weights to be given to them to construct the overall index of corporate governance. However, eventually we come up with two factors representing one Sub-index for both the Supervisory Board and Ownership and one Sub-index for both the levels of Transparency and Shareholder Rights. Both factors were strongly significant in all regressions, including FE and RE IV analysis. Moreover, if both factors are included into 2SLS regression Durbin-Wu-Hausman test cannot reject the null of validity of instruments at 5% significance level (p=0.0885).

In Table 10B we present the OLS and 2SLS results for regression of *Net Revenue* on the generated variables. In OLS estimation (column 1) all three factors are highly statistically strong, Supervisory Board Sub-index at 0.0407 (z=3.17), Transparency Sub-index at 0.0422 (z=3.37) and Shareholder Rights Sub-index at 0.1615 (z=8.37). The last two sub-indices preserve their power if we use instrumental variables analysis (2SLS); Transparency Sub-index at 0.4737 (z=2.07, column 3) and Shareholder Rights Sub-index at 0.6244 (z=2.62, column 2) respectively. We do not present results for GMM estimation, however the only important difference in results is that Transparency Sub-index becomes marginally significant at 0.4660 (z=1.93) if we control for heteroskedasticity.

However, in columns 2-4 we might have an omitted variable problem, since we do not control for the rest of the index. This is perhaps exactly what makes an endogeneity problem significant; this is confirmed by the Durbin-Wu-Hausman test that rejects the null of exogeneity of corporate governance variables at 5% level.

In Table 10C we present the results of panel IV regressions including all other control variables. In Columns 4-6, fixed-effects IV regression, produce highly significant coefficients for each pfa-factor, in particular for Shareholder Rights Sub-index at 0.3762 (z=6.55), for Transparency Sub-index at 1.5203 (z=3.01) and for Supervisory Board Sub-index at 2.1472 (z=3.42). RE IV estimator still produced significant coefficients although for Transparency Sub-index significance is marginal (see columns 1-3 of Table 10C).

This is a strong evidence of positive influence of corporate governance sub-indices on performance with the factors produced by PFA. Importantly, this result is obtained for fixed effects IV estimator that permits, first, to eliminate firm effect thanks to within transformation and, second, use instrumental variable analysis to further tackle with possible endogeneity.

9. Conclusions and Policy Recommendations

In this paper we find very strong empirical support for our main hypothesis that there is a positive and causal relationship between corporate governance quality and enterprise performance. Moreover we establish it for transitional economy, which confirms that corporate governance matters not only for developed and developing economies but also for transitional ones. This also provides a support to Stiglitz's (1999) argument that establishment and enforcement of proper corporate governance principles shall significantly enhance development of individual corporations and economies as a whole. From the point of view of corporations this results mean that they indeed would benefit in terms of performance from raising their standards of corporate governance. So that corporations and/or their owners have a good incentive to voluntarily improve their governance standards.

Our overall corporate governance index is highly significant in all specifications (OLS, 2SLS, 2S GMM, FE and RE, FE IV and RE IV). We also do not detect significant endogeneity of the index. Based on OLS results, one-point-increase in our overall corporate governance index predicts around a half-percent increase in net revenues; and worst to best change in our overall corporate governance index predicts about 40% increase in company's net revenues.

We document statistically strong effects of Shareholder Rights Sub-index, Transparency Sub-index and Board Structure Sub-index on performance. Importantly, our analysis provides the first strong evidence that board independence is important and relevant in transitional market. This result is well expected from theory because outside directors could be sufficiently independent to control self-dealing by insiders.

Surprisingly we do not find the positive effect of separation of responsibilities by CEO and Board Chairman on performance. On the contrary we document the indication that if the Chairman is not either also the CEO or at least employed at the company then it has a detrimental impact on performance.

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Figure 1. Distribution of Corporate Governance Index, UCGI

Histogram of corporate governance index (UCGI) scores distribution and normal density curve. Sample size = 10,035. Mean = 65.2392; median = 66.6667; minimum = 20; maximum = 93.8087; standard deviation = 13.4010; skewness = -0.2526, kurtosis = 2.2309.

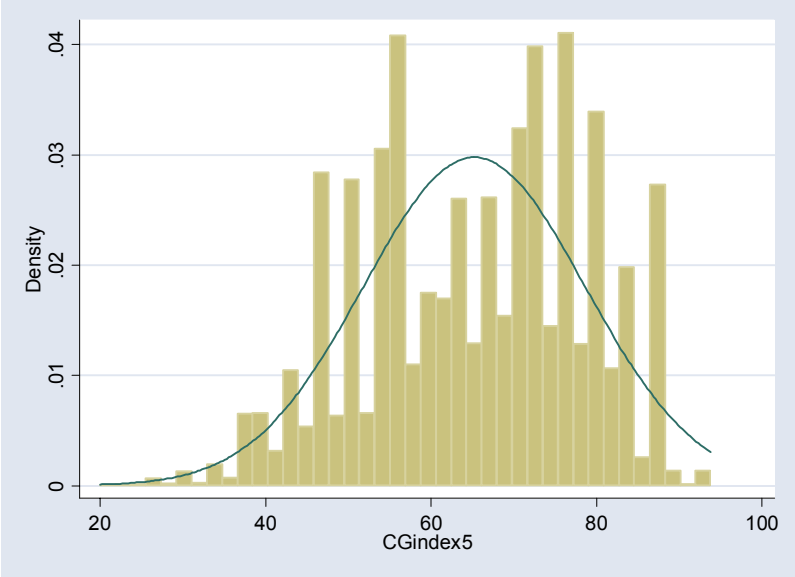


Figure 2. Corporate Governance and Output, Net Revenues

Scatter plot of corporate governance quality index (UCGI) versus output, Net Revenues. Output is taken of natural logarithm and outliers identified by method of Hadi (1994) (around 16.82% of observations) are excluded in the scatter plot for better visual presentation.

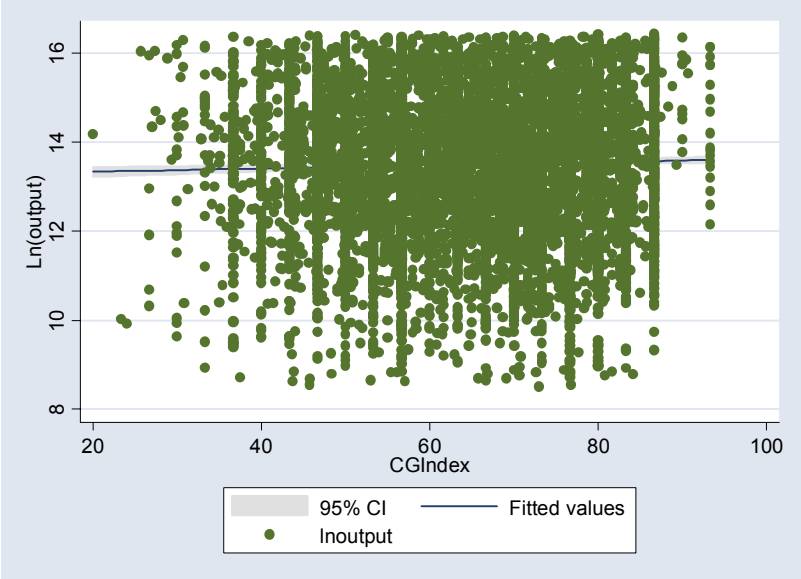


Table 1. Explanations on Construction and Problems with Elements of Corporate Governance Indices

In this table we give explanation on how the governance elements are constructed and on the difficulties associated with their construction. The only source of all information is annual financial statements of firms, available on *http://www.istock.com.ua*.

Elements of corporate governance	How it is constructed	Possible distortions/ problems
	I. Shareholder rights	
1.Shareholder registrar: independent or the own	We compared OKPO code of the enterprise with the OKPO code of registrar of its shares.	Not all companies reported the OKPO of their registrar.
2.Regularity of general shareholder meetings	For each year we looked at the date of the last meeting.	
3.Extra shareholder meeting and its attendance	Required part of annual financial reporting.	
	II. Transparency/Information Disclosure	
1. Presence of nominal shareholding at a company	Checked the ownership structure for the presence of nominal shareholders.	We do not know its ultimate contribution to transparency.
2. Company's website	Checked if information on company contains information on its website.	Not all companies might have reported on this, since it is not a one of key elements of statements. We do not know the *content* of the websites.
3. Timeliness of publication of annual financial statements	Checked if and when the financial statements were published in that particular year.	We suspect that some companies that did not report this information in financial statements actually published the reports properly. But we cannot check this.
4. Publication of information on registrar	Checked if annual financial statements contain information on registrar	
5. Publication of information on auditor	Checked if annual financial statements contain information on auditor	
6. Company's auditor	Checked the name of the auditor.	
	III. Supervisory Board Structure	
1. Proportion of nonemployed directors	Marked if the name of the company where the person serves as director is different from the name of his/her last place of work. Then, calculated the proportion of unemployed directors.	Names of the companies are often written in free form (without consistency), e.g. with different abbreviations, some times in different languages (Russian, English). This complicated the process of comparing the names and might have entailed some errors.
	IV. Supervisory Board Procedure	
1. Nonemployment of Chairman	Similarly to previous item.	Similarly to previous item.
2. CEO/Chairman	Marked if the person serves as a director is also employed at that company as one of CEO (e.g. either as a general director, or chief accountant, financial director etc.)	Similarly to previous item. Sometimes it was difficult to determine if the person is one of CEO, due to huge variation in different names of positions.
	IV. Ownership Structure	
1. Private Ownership	Calculated as (100%-% of state ownership).	
2. Absence of large shareholder	Checked if there is no owner of 50% share stake in a firm.	We do not have information and cannot control for cross-holdings.

Table 2. Panel A. Descriptive statistics (with outliers)

Variable	Abbr.	Obs	Mean	St. Dev.	Min	Max
Output variable						
Net Total Revenue, UAH	output	10244	17,700,000	151,000,000	5,000	5,670,000,000
Input variables						
Fixed Assets, UAH	capital	10243	12,000,000	77,800,000	200	3,000,000,000
Employment, workers	labor	10244	350	1465	2	59912
Regional dummies						
West (region)	west	10244	0.20	0.40	0	1
East (region)	east	10244	0.28	0.45	0	1
Center (region)	center	10244	0.34	0.48	0	1
South (region)	south	10244	0.17	0.37	0	1
Industry dummies (by first digit)						
	Services	10188	0.12	0.32	0	1
	Health and Tourism	10188	0.0030	0.06	0	1
	Utilities	10188	0.01	0.10	0	1
	Agriculture	10188	0.14	0.35	0	1
	Communication	10188	0.0007	0.03	0	1
	Construction	10188	0.11	0.32	0	1
	Finance	10188	0.0010	0.03	0	1
	Industry	10188	0.44	0.50	0	1
	Science	10188	0.01	0.12	0	1
	Trade	10188	0.05	0.22	0	1
	Transport	10188	0.11	0.32	0	1

Panel B. Descriptive Statistic for the Outliers (detected by method of Hadi, 1992, 1994)

Variable	Abbr.	Obs	Mean	St. Dev.	Min	Max
Output variable						
Net Total Revenue, UAH	output	1,734	93,800,000	350,000,000	13,800	5,670,000,000
Input variables						
Fixed Assets, UAH	capital	1,734	60,100,000	181,000,000	280,000	3,000,000,000
Employment, workers	labor	1,734	1475.874	3274.767	2	59912
Regional dummies						
West (region)	west	1,734	0.1401	0.3472	0	1
East (region)	east	1,734	0.3887	0.4876	0	1
Center (region)	center	1,734	0.3379	0.4731	0	1
South (region)	south	1,734	0.1332	0.3399	0	1
Industry dummies (by first digit)						
	Services	1,723	0.0435	0.2041	0	1
	Health and Tourism	1,723	0.0035	0.0589	0	1
	Utilities	1,723	0.0302	0.1711	0	1
	Agriculture	1,723	0.0662	0.2486	0	1
	Communication	1,723	0.0000	0.0000	0	0
	Construction	1,723	0.0737	0.2614	0	1
	Finance	1,723	0.0017	0.0417	0	1
	Industry	1,723	0.7185	0.4499	0	1
	Science	1,723	0.0029	0.0538	0	1
	Trade	1,723	0.0418	0.2002	0	1
	Transport	1,723	0.0174	0.1308	0	1

Panel C. Descriptive Statistics (without outliers)

Variable	Abbr.	Obs	Mean	St. Dev.	Min	Max
Output variable						
Net Total Revenue, UAH	output	8,509	1,789,307	2,388,279	5,000	13,600,000
Input variables						
Fixed Assets, UAH	capital	8,509	2,264,176	2,477,679	200	15,000,000
Employment, workers	labor	8,509	117.6434	111.6981	2	672
Regional dummies						
West (region)	west	8,509	0.2172	0.4124	0	1
East (region)	east	8,509	0.2621	0.4398	0	1
Center (region)	center	8,509	0.3459	0.4757	0	1
South (region)	south	8,509	0.1749	0.3799	0	1
Industry dummies (by first digit)						
	Services	8,464	0.1319	0.3384	0	1
	Health and Tourism	8,464	0.0030	0.0543	0	1
	Utilities	8,464	0.0065	0.0804	0	1
	Agriculture	8,464	0.1550	0.3619	0	1
	Communication	8,464	0.0008	0.0287	0	1
	Construction	8,464	0.1217	0.3269	0	1
	Finance	8,464	0.0008	0.0287	0	1
	Industry	8,464	0.3788	0.4851	0	1
	Science	8,464	0.0172	0.1302	0	1
	Trade	8,464	0.0500	0.2179	0	1
	Transport	8,464	0.1342	0.3409	0	1

Table 3. Descriptive Statistics of elements of corporate Governance

Variable	N	Obs	Mean	St. Dev.	Min	Max
Sub-index of Stakeholder Rights						
=1 if the registrar is independent	2	8,509	0.9466	0.2248	0	1
=1 if there were an annual general shareholder meeting	5	8,509	0.6416	0.4796	0	1
=1 if there were an extra shareholder meeting at that year	6	8,509	0.0188	0.1358	0	1
Sub-index of Transparency/Information Disclosure						
=1 if the annual report contains information on firm's auditor	3	8,509	0.9536	0.2104	0	1
=1 if the auditor is the recognized international company	4	8,509	0.0000	0.0000	0	0
=1 if the annual report contains information on firm's registrar	1	8,509	0.9337	0.2488	0	1
=1 if the annual financial information was published properly (by Sept, 30)	7	8,509	0.7055	0.4558	0	1
=1 if the company has a website as a way of communication with its stakeholders	8	8,509	0.0119	0.1083	0	1
= 1 if there is no nominal shareholding in a firm	13	8,509	0.9566	0.2037	0	1
Sub-index of Supervisory Board Structure						
= the percentage of unemployed directors at Supervisory Board	10	8,509	0.5100	0.3781	0	1
Sub-index of Supervisory Board Procedure						
=1 if the Chairman of Supervisory Board is not employed at the company he serves as chairman	9	8,509	0.5873	0.4924	0	1
=1 if company's CEO does not also serve as the company's Chairman	11	8,509	0.9470	0.2241	0	1
Sub-index of Ownership Structure						
= share of private ownership in a firm	12	8,509	0.9012	0.2289	0	1
= absence of controlling shareholder (owner of more then 50 % shares)	14	8,509	0.7788	0.4151	0	1

Year		2000			2001			2002		
Variable	N	Obs	Mean	St.Dev.	Obs	Mean	St.Dev.	Obs	Mean	St.Dev.
=1 if the annual report contains information on firm's registrar	1	3611	0.9286	0.2576	2825	0.9324	0.2511	2073	0.9445	0.2290
=1 if the registrar is independent	2	3611	0.9438	0.2304	2825	0.9483	0.2214	2073	0.9493	0.2193
=1 if the annual report contains information on firm's auditor	3	3611	0.9432	0.2314	2825	0.9572	0.2025	2073	0.9667	0.1794
=1 if the auditor is the recognized international company	4	3611	0.0000	0.0000	2825	0.0000	0.0000	2073	0.0000	0.0000
=1 if there were an annual general shareholder meeting	5	3611	0.5132	0.4999	2825	0.7565	0.4293	2073	0.7086	0.4545
=1 if there were an extra shareholder meeting at that year	6	3611	0.0022	0.0470	2825	0.0372	0.1892	2073	0.0227	0.1489
=1 if the annual financial information was published properly (by Sept, 30)	7	3611	0.5281	0.4993	2825	0.8127	0.3902	2073	0.8683	0.3382
=1 if the company has a website for communication with its stakeholders	8	3611	0.0089	0.0937	2825	0.0135	0.1152	2073	0.0150	0.1214
=1 if the Chairman of Supervisory Board is not employed at the company he serves as chairman	9	3611	0.5586	0.4966	2825	0.6014	0.4897	2073	0.6179	0.4860
The percentage of unemployed directors at Supervisory Board	10	3611	0.4850	0.3763	2825	0.5216	0.3791	2073	0.5376	0.3776
=1 if company's CEO does not also serve as the company's Chairman	11	3611	0.9479	0.2222	2825	0.9494	0.2193	2073	0.9421	0.2336
= share of private ownership in a firm	12	3611	0.9013	0.2285	2825	0.9007	0.2286	2073	0.9016	0.2303
= 1 if there is no nominal shareholding in a firm	13	3611	0.9560	0.2052	2825	0.9586	0.1993	2073	0.9551	0.2071
= absence of large shareholder (owner of more then 50 % shares)	14	3611	0.8192	0.3849	2825	0.7720	0.4196	2073	0.7178	0.4502

Table 4. Descriptive Statistics for Corporate Governance Index, Sub-indices and Instrumental Variables

Descriptive statistics for corporate governance index and subindexes, instrumental variables and selected other variables used in this study.

Panel A.a Corporate Governance Index and Sub-indices

Variable	Abbr.	Obs	Mean	Std.Dev.	Min	Max
Shareholder Rights Subindex	Rightsindex	10313	10.8168	3.7250	0	20.0000
Information Disclosure/Transparency Subindex	Transindex	10035	11.9073	2.1536	0	16.6667
Supervisory Board Structure Subindex	SBstructuresubindex	10313	10.6253	7.4838	0	20.0000
Supervisory Board Procedure Subindex	SBproceduresubindex	10313	15.4494	6.0073	0	20.0000
Ownership Subindex	Ownershipsubindex	10035	16.5957	4.9088	0	20.0000
Overall Corporate Governance Index	UCGI	10035	65.2392	13.4010	20	93.8087

Panel A.b Descriptive Statistics of Corporate Governance Indexes by years

-> year = 2000

Variable	Obs	Mean	Std. Dev.	Min	Max
Rightsindex	4337	9.7917	3.6756	0.0000	20.0000
Transindex	4240	11.2524	2.2945	0.0000	16.6667
SBstructuresubindex	4337	10.0462	7.4608	0.0000	20.0000
SBproceduresubindex	4337	15.1372	6.0086	0.0000	20.0000
Ownershipsubindex	4240	17.0519	4.6562	0.0000	20.0000
UCGI	4240	63.1309	13.2924	20.0000	93.3333

-> year = 2001

Variable	Obs	Mean	Std. Dev.	Min	Max
Rightsindex	3385	11.7578	3.5562	0.0000	20.0000
Transindex	3304	12.2801	1.9377	3.3333	16.6667
SBstructuresubindex	3385	10.8319	7.4843	0.0000	20.0000
SBproceduresubindex	3385	15.6189	5.9531	0.0000	20.0000
Ownershipsubindex	3304	16.4967	4.9483	0.0000	20.0000
UCGI	3304	66.8413	13.1926	23.3333	93.8087

-> year = 2002

Variable	Obs	Mean	Std. Dev.	Min	Max
Rightsindex	2591	11.3032	3.5988	0.0000	20.0000
Transindex	2491	12.5278	1.8567	3.3333	16.6667
SBstructuresubindex	2591	11.3249	7.4503	0.0000	20.0000
SBproceduresubindex	2591	15.7507	6.0537	0.0000	20.0000
Ownershipsubindex	2491	15.9504	5.1892	0.0000	20.0000
UCGI	2491	66.7026	13.3753	26.6667	93.3333

Panel Ba. Instrumental Variables

Variable	Description	Abbr.	Obs	Mean	Std.Dev.	Min	Max
Political Diversity	Probability that two randomly taken people voted for different candidates on presidential elections 2004 (final round) by region	Elections	10313	0.1593	0.0642	0.0381	0.2498
Religious Factor	Number of religious organizations (i.e. Christian churches) by regions and years	Religion	10313	1083.6420	565.1692	402.0000	2813.0000
Ethnic Diversity	Probability that two randomly taken people from given oblast are of different nationality	Ethnicity	10313	0.1302	0.0784	0.0215	0.2453
Methods of privatization	Method of privatization of enterprise by sale of shares of open JSC	Sharesales	10313	0.6688	0.4707	0.0000	1.0000
Methods of privatization	Method of privatization by purchase of enterprise after leasing	Repurcha	10313	0.0107	0.1027	0.0000	1.0000

Panel Bb. Number of Privatised Companies across Years and Methods of Privatisation

Year of privatisation	Number of companies privatised by specific method of privatisation	
	By sale of shares	By repurchase after leasing
1993	211	58
1994	774	45
1995	2,171	10
1996	1,688	3
1997	813	
1998	868	
1999	188	
2000	93	
2001	39	
2002	12	
2004	9	
Total	6866	116

Panel C. Correlation Matrix of Elements of Corporate Governance Quality

Correlations among the individual elements (indicators) of corporate governance quality. Significance level of each correlation is printed under it. Statistically significant correlations (at 5% level or better) are shown in **boldface**.

N	Element of corporate governance quality	1	2	3	4	5	6	7	8	9	11	12	13	14	15
1	=1 if the annual report contains information on firm's registrar	1													
2	=1 if the registrar is independent	**-0.06**	1												
		0													
3	=1 if the annual report contains information on firm's auditor	**0.15**	0.02	1											
		0	-0.08												
4	=1 if the firm's auditor serves at least to 20 companies	**0.03**	0	**0.15**	1										
		0	-0.81	0											
5	=1 if the auditor is the recognized international company	0	0	0	-0.01	1									
		-0.7	-0.75	-0.75	-0.35										
6	=1 if there were an annual general shareholder meeting	**0.06**	-0.01	**0.02**	**-0.03**	0.01	1								
		0	-0.59	-0.04	0	-0.3									
7	=1 if there were an extra shareholder meeting at that year	0.01	0.02	-0.01	**-0.03**	**0.09**	**0.11**	1							
		-0.48	-0.11	-0.21	0	0	0								
8	=1 if the annual financial information was published properly (by Sept, 30)	**0.03**	**-0.02**	**0.07**	**0.03**	-0.01	**0.18**	**0.05**	1						
		0	-0.01	0	0	-0.5	0	0							
9	=1 if the company has a website	**-0.02**	0.01	**-0.05**	**-0.09**	**0.08**	**0.04**	**0.04**	**0.05**	1					
		-0.04	-0.21	0	0	0	0	0	0						
11	=1 if the Chairman of Supervisory Board is not employed at the company he serves as chairman	-0.01	**0.07**	**-0.03**	**-0.06**	0	0	**0.06**	-0.02	0.01	1				
		-0.13	0	0	0	-0.77	-0.68	0	-0.11	-0.17					
12	The percentage of unemployed directors at Supervisory Board	**-0.03**	**0.07**	**-0.04**	**-0.09**	0.01	0.01	**0.07**	-0.01	**0.06**	**0.75**	1			
		-0.01	0	0	0	-0.25	-0.6	0	-0.25	0	0				
13	=1 if company's CEO does not also serve as the company's Chairman	0.01	-0.01	-0.01	0.02	0	-0.01	0.02	**-0.03**	-0.01	**0.3**	**0.19**	1		
		-0.26	-0.48	-0.42	-0.11	-0.73	-0.21	-0.11	-0.01	-0.2	0	0			
14	=1 if at least 50% of board members are not employed	**-0.03**	**0.06**	**-0.03**	**-0.09**	0.01	0	**0.06**	-0.02	**0.06**	**0.65**	**0.89**	**0.16**	1	
		0	0	0	0	-0.18	-0.99	0	-0.11	0	0	0	0		
15	Ln(output)	**-0.06**	**0.05**	-0.01	**-0.13**	**0.04**	**0.07**	**0.09**	**0.12**	**0.26**	**0.03**	**0.09**	**-0.05**	**0.1**	1
		0	0	-0.23	0	0	0	0	0	0	0	0	0	0	

Panel D. Correlation Matrix of Corporate Governance Index, Subindices and Instrumental Variables

Correlations among logarithm of output (Net Revenues), overall corporate governance index (UCGI), each subindex and instrumental variables. Significance level of each correlation is printed under it. Statistically significant correlations (at 5% level or better) are shown in **boldface**.

		1	2	3	4	5	6	7	8	9	10	11	12
1	lnoutput	1											
2	UCGI	**0.06**	1										
		0											
3	Shareholderindex	**0.1**	**0.34**	1									
		0	0										
4	Transparencyindex	**0.1**	**0.17**	**0.13**	1								
		0	0	0									
5	Boardstructureindex	**0.09**	**0.81**	**0.05**	**-0.03**	1							
		0	0	0	-0.01								
6	Boardprocedureindex	0	**0.78**	**0.03**	**-0.03**	**0.68**	1						
		-0.63	0	0	-0.01	0							
7	Ownershipindex	**-0.05**	**0.21**	0	0.01	**-0.18**	**-0.14**	1					
		0	0	-0.82	-0.4	0	0						
8	Elections	-0.01	**-0.04**	**-0.03**	**-0.08**	**-0.02**	**-0.03**	0.02	1				
		-0.33	0	0	0	-0.04	0	-0.1					
9	Religion	0.01	**0.06**	**0.06**	**0.11**	0.01	0.01	0.02	**-0.55**	1			
		-0.2	0	0	0	-0.36	-0.16	-0.13	0				
10	Ethnicity	**0.08**	**0.03**	**0.05**	**-0.04**	**0.06**	**0.03**	**-0.04**	**0.21**	**-0.45**	1		
		0	0	0	0	0	0	0	0	0			
11	Sharesales	**0.17**	**0.05**	**0.09**	**0.04**	**0.02**	-0.01	**0.04**	**-0.03**	0	0.01	1	
		0	0	0	0	-0.04	-0.57	0	-0.01	-0.63	-0.3		
12	Repurcha	**0.04**	-0.02	0	**-0.03**	0	-0.01	**-0.02**	0	**0.03**	**-0.02**	**-0.15**	1
		0	-0.1	-0.93	0	-0.67	-0.34	-0.01	-0.92	-0.01	-0.01	0	

Panel E. Additional Descriptive Statistics for the Elements of Corporate Governance (in particular, to highlight the changes over time) n = 9278.

		Overall		Between		Within	n=
isregist		**Freq.**	**Percent**	**Percent**	**Freq.**	**Percent**	
	0	2257	12.19	74.24	1618	17.44	
	1	16263	87.81	95.88	8281	89.25	
	Total	18520	100	92.35	9899	106.69	
inregist							
	0	891	4.81	81.44	493	5.31	
	1	17629	95.19	98.81	8949	96.45	
	Total	18520	100	97.9	9442	101.77	
isaudit							
	0	1086	5.86	62.13	859	9.26	
	1	17434	94.14	96.83	8924	96.18	
	Total	18520	100	93.78	9783	105.44	
audit							
	0	13168	71.1	86.15	7458	80.38	
	1	5352	28.9	70.21	3599	38.79	
	Total	18520	100	80.96	11057	119.17	
intaudit							
	0	18517	99.98	99.98	9278	100	
	1	3	0.02	33.33	3	0.03	9278
	Total	18520	100	99.96	9281	100.03	
zbory							
	0	7152	38.62	58.92	5893	63.52	
	1	11368	61.38	73.89	7042	75.9	
	Total	18520	100	67.07	12935	139.42	
adzbory							
	0	18147	97.99	98.16	9251	99.71	
	1	373	2.01	43.83	344	3.71	
	Total	18520	100	96.21	9595	103.42	
publ							
	0	6003	32.41	61.44	5087	54.83	
	1	12517	67.59	80.36	7020	75.66	
	Total	18520	100	72.41	12107	130.49	
www							
	0	17907	96.69	98.98	9083	97.9	
	1	613	3.31	75.49	343	3.7	
	Total	18520	100	98.12	9426	101.6	
chairunemloy							5978
	0	4696	40.02	86.18	2699	45.15	
	1	7038	59.98	90.53	3887	65.02	
	Total	11734	100	88.75	6586	110.17	
ceo							6155
	0	682	5.56	71.41	443	7.2	
	1	11581	94.44	97.78	5924	96.25	
	Total	12263	100	95.94	6367	103.44	
indepsb							5669
	0	5283	47.64	86.86	3016	53.2	
	1	5806	52.36	87.81	3299	58.19	
	Total	11089	100	87.36	6315	111.4	

Table 5. Panel A. OLS with all control variables, overall corporate governance index, *UCGI* and corporate governance sub-indices

Ordinary least squares regressions with robust standard errors of Net Revenues on Corporate Governance Index (UCGI) with all control variables. In specifications (2), (4) and (6) we exclude the outliers identified by method of Hadi (1994) (around 16.82% of observations). *, **, *** respectively indicate significance levels at 10%, 5%, and 1% levels. R-sq is shown for each regression. Significant results (at 5% level or better) are shown in **boldface**.

	(1) lnoutput	(2) lnoutput	(3) lnoutput	(4) lnoutput	(5) lnoutput	(6) lnoutput
UCGI (overall)	**0.0049*** **	**0.0051*** **				
	(5.59)	**(5.46)**				
Shareholder Rights Subindex			**0.0130*** **	**0.0112*** **	**0.0134*** **	**0.0115*** **
			(4.11)	**(3.43)**	**(4.23)**	**(3.54)**
Transparency Subindex			**0.0423*** **	**0.0396*** **	**0.0431*** **	**0.0406*** **
			(7.70)	**(6.74)**	**(7.90)**	**(6.96)**
Board Structure Subindex			**0.0122*** **	**0.0098*** **	**0.0118*** **	**0.0090*** **
			(5.88)	**(4.52)**	**(5.69)**	**(4.18)**
Board Procedure Subindex			**-0.0071*** **	-0.0042	**-0.0072*** **	-0.0045*
			(2.90)	(1.61)	**(2.99)**	(1.71)
Ownership Subindex			-0.0014	0.0030		
			(0.51)	(1.03)		
Share of Private Ownership					**0.2828*** **	**0.4936*** **
					(4.60)	**(7.21)**
No controlling shareholder					**-0.1157*** **	**-0.1204*** **
					(3.99)	**(3.94)**
log(Capital)	**0.1117*** **	**0.0696*** **	**0.1091*** **	**0.0702*** **	**0.1090*** **	**0.0695*** **
	(7.07)	**(4.12)**	**(6.89)**	**(4.15)**	**(6.92)**	**(4.16)**
log(labor)	**1.0631*** **	**1.0351*** **	**1.0582*** **	**1.0308*** **	**1.0575*** **	**1.0254*** **
	(56.06)	**(49.48)**	**(55.72)**	**(49.19)**	**(56.08)**	**(49.55)**
Services	**1.0890*** **	**0.9869*** **	**1.0693*** **	**0.9813*** **	**1.0622*** **	**0.9684*** **
	(23.73)	**(21.43)**	**(23.02)**	**(21.06)**	**(23.00)**	**(20.94)**
Health and Tourism	**0.4076*** **	**0.4741*** **	**0.4283*** **	**0.5189*** **	**0.4007*** **	**0.4771*** **
	(2.85)	**(2.90)**	**(3.02)**	**(3.23)**	**(2.80)**	**(2.91)**
Utilities	**0.5787*** **	**0.3871*** **	**0.5546*** **	**0.3671*** **	**0.5517*** **	**0.3779*** **
	(5.45)	**(3.04)**	**(5.20)**	**(2.89)**	**(5.15)**	**(2.91)**
Agriculture	-0.0672*	-0.0251	-0.0506	-0.0115	-0.0418	0.0000
	(1.78)	(0.66)	(1.34)	(0.30)	(1.11)	(0.00)
Communications	0.4092*	0.4417*	0.4777*	**0.5155** **	0.4471*	0.4672*
	(1.74)	(1.88)	(1.85)	**(2.03)**	(1.71)	(1.82)
Construction	**0.1406*** **	**0.0951** **	**0.1489*** **	**0.1070*** **	**0.1538*** **	**0.1092*** **
	(3.61)	**(2.39)**	**(3.80)**	**(2.68)**	**(3.94)**	**(2.76)**
Finance	-0.2203	0.0434	**-0.3506** **	-0.0425	**-0.4141** **	-0.1446
	(1.47)	(0.45)	**(2.11)**	(0.33)	**(2.46)**	(1.05)
Industry	**0.4691*** **	**0.3888*** **	**0.4614*** **	**0.3912*** **	**0.4598*** **	**0.3882*** **
	(14.28)	**(11.53)**	**(13.97)**	**(11.54)**	**(13.98)**	**(11.51)**
Science	-0.0197	-0.0121	-0.0202	0.0012	-0.0374	-0.0211
	(0.22)	(0.13)	(0.23)	(0.01)	(0.43)	(0.24)
Trade	**1.2611*** **	**1.1485*** **	**1.2406*** **	**1.1412*** **	**1.2359*** **	**1.1307*** **
	(20.56)	**(18.29)**	**(20.30)**	**(18.25)**	**(20.25)**	**(18.22)**
year2001	**0.2566*** **	**0.2383*** **	**0.1976*** **	**0.1904*** **	**0.1913*** **	**0.1816*** **
	(9.67)	**(8.63)**	**(7.13)**	**(6.60)**	**(6.93)**	**(6.34)**
year2002	**0.4718*** **	**0.4398*** **	**0.4022*** **	**0.3832*** **	**0.3927*** **	**0.3665*** **
	(16.75)	**(15.08)**	**(13.69)**	**(12.57)**	**(13.42)**	**(12.13)**
Western Region	**-0.2356*** **	**-0.2218*** **	**-0.2381*** **	**-0.2271*** **	**-0.2270*** **	**-0.2129*** **
	(6.07)	**(5.63)**	**(6.14)**	**(5.76)**	**(5.88)**	**(5.44)**
Eastern Region	**0.1450*** **	**0.1313*** **	**0.1469*** **	**0.1304*** **	**0.1515*** **	**0.1366*** **
	(4.22)	**(3.69)**	**(4.28)**	**(3.67)**	**(4.42)**	**(3.85)**
Central Region	**0.1710*** **	**0.1531*** **	**0.1762*** **	**0.1555*** **	**0.1796*** **	**0.1584*** **
	(5.22)	**(4.60)**	**(5.37)**	**(4.66)**	**(5.49)**	**(4.78)**
Constant	**6.4329*** **	**7.1372*** **	**6.2108*** **	**6.8266*** **	**6.0222*** **	**6.5590*** **
	(39.07)	**(37.80)**	**(33.23)**	**(32.47)**	**(31.67)**	**(31.03)**
Observations	**9913**	**8464**	**9913**	**8464**	**9913**	**8464**
Centered R-squared	**0.62**	**0.51**	**0.63**	**0.51**	**0.63**	**0.52**

Panel B. OLS Results for Subindeces

Ordinary least squares regressions with *robust* standard errors of Net Revenues on UCGI and each corporate governance subindex. Control variables and sample are the same as in our base OLS regression (Table 3A). We also exclude the outliers identified by method of Hadi (1994) (around 16.82% of observations). In the regressions in row (1), we replace UCGI with indicated subindex, without separate control for the rest of corporate governance index. In the regressions in raw (2) we add a control variable for a 'Reduced Index', which equals the UCGI net of the subindex, and has a potential range of 0~80. *, **, *** respectively indicate significance levels at 10%, 5%, and 1% levels. R-sq is shown for each regression. Statistically significant results (at 5% level or better) are shown in **boldface**.

	***UCGI* or Subindex**	***UCGI***	**Shareholder Rights Subindex**	**Transparency Subindex**	**Board Structure Subindex**	**Board Procedure Subindex**	**Ownership Subindex**
1	Coefficient for *UCGI* or indicated subindex (substituted for *UCGI*)	**0.0051****	**0.0131*****	**0.0395*****	**0.0068*****	0.0032	0.0023
		(5.45)	**(3.99)**	**(6.71)**	**(4.09)**	(1.57)	(0.78)
		0.5064	**0.5055**	**0.5073**	**0.5056**	0.5047	0.5046
2A	Coefficient for indicated subindex, with control for Reduced Index		**0.0126*****	**0.0400*****	**0.0042*****	-0.0044*	0.0040
			(3.84)	**(6.81)**	**(2.32)**	(-1.92)	(1.40)
			0.5067	**0.5086**	**0.5064**	0.5076	0.5064
2B	Coefficient for Reduced Index (construct of remaining subindeces), from same regression as column 2A		**0.0044*****	**0.0043*****	**0.0058*****	**0.0102*****	**0.0052*****
			(4.45)	**(4.58)**	**(3.54)**	**(6.73)**	**(5.44)**
			0.5067	**0.5086**	**0.5064**	**0.5076**	**0.5064**

Panel C. OLS Results for Individual Elements of the Corporate Governance Index

Ordinary least squares regressions with robust standard errors for individual elements of the corporate governance index. Control variables and sample are the same as in our base OLS regression (Table 3A). We also exclude from estimation the outliers identified by method of Hadi (1994) (around 16.82% of observations). In the regressions in column (1), we give the coefficients for each individual element of corporate governance, without separate control for the rest of corporate governance index. In the regressions in column (2) we present the results when all the corporate governance elements are included into the regression as separate independent variables. The regressions in column (3) include controls for the rest of the corporate governance index. And coefficients in column (4) are for reduced index (overall index net of the respective element) used in regressions in column (3). *, **, *** respectively indicate significance levels at 10%, 5%, and 1% levels. Statistically significant results (at 5% level or better) are shown in **boldface**.

N	Description of corporate governance element	Alone (1)	With all others (2)	Controlling for the rest of index (3)	Coefficient for reduced index (control) (4)
1	=1 if the annual report contains information on firm's registrar	-0.0860* (-1.86)	**-0.1055**** **(-2.28)**	-0.0884* (-1.92)	**0.0052***** **(5.62)**
2	=1 if the registrar is independent	**-0.1288**** **(-2.53)**	**-0.1324***** **(-2.62)**	**-0.1424***** **(-2.81)**	**0.0055***** **(5.86)**
3	=1 if the annual report contains information on firm's auditor	0.1088* (1.88)	**0.1696***** **(2.92)**	**0.1169**** **(2.01)**	**0.0050***** **(5.42)**
4	=1 if the firm's auditor serves at least to 20 companies	**-0.0830***** **(-3.21)**	**-0.1040***** **(-4.02)**		
5	=1 if the auditor is the recognized international company	-	-		
6	=1 if there were an annual general shareholder meeting	**0.1276***** **(5.00)**	**0.1070***** **(4.21)**	**0.1264***** **(4.97)**	**0.0041***** **(4.35)**
7	=1 if there were an extra shareholder meeting at that year	**0.2341***** **(2.70)**	**0.1825**** **(2.08)**	**0.2130***** **(2.46)**	**0.0048***** **(5.15)**
8	=1 if the annual financial information was published properly (by Sept, 30)	**0.2106***** **(7.51)**	**0.2034***** **(7.28)**	**0.2117***** **(7.57)**	**0.0044***** **(4.69)**
9	=1 if the company has a website	**0.5095***** **(7.07)**	**0.4729***** **(6.37)**	**0.4945***** **(6.92)**	**0.0049***** **(5.28)**
10	=1 if the Chairman of Supervisory Board is not employed at the company he serves as chairman	**0.0533**** **(2.17)**	-0.0454 (-1.26)	-0.0461 (-1.56)	**0.0090***** **(5.91)**
11	The percentage of unemployed directors at Supervisory Board	**0.1357***** **(4.09)**	**0.1819***** **(3.85)**	**0.0828**** **(2.28)**	**0.0058***** **(3.59)**
12	=1 if company's CEO does not also serve as the company's Chairman	-0.0300 (-0.59)	-0.0522 (-1.03)	-0.0979* (-1.89)	**0.0061***** **(6.10)**
13	=1 if at least 50% of board members are not employed	**0.1081***** **(4.40)**	**0.1101***** **(4.49)**		
14	Share of private ownership at a firm	**0.4806***** **(6.93)**	**0.4731***** **(6.88)**	**0.4918***** **(7.15)**	**0.0038***** **(4.14)**
15	Absence of controlling shareholder	**-0.1206***** **(-3.93)**	**-0.1153***** **(-3.75)**	**-.0971***** **(-3.15)**	**0.0060***** **(6.35)**
16	Absence of nominal shareholding	**0.1512***** **(2.52)**		**0.1503***** **(2.49)**	**0.0050***** **(5.33)**

Table 6. Trust Factors (Religion, Politics, Ethnicity), Privatization and Corporate Governance

Ordinary least squares regressions with robust standard errors. Control variables are the same as in our base OLS regression (Table 3A). We also exclude from estimation the outliers identified by method of Hadi (1994) (around 16.82% of observations). *, **, *** respectively indicate significance levels at 10%, 5%, and 1% levels. Statistically significant results (at 5% level or better) are shown in **boldface**.

	(1) **UCGI (overall)**	(2) **Shareholder Rights Subindex**	(3) **Transparency Subindex**	(4) **Board Structure Subindex**	(5) **Board Procedure Subindex**	(6) **Ownership Subindex**	(7) **lnoutput**
Religion	**0.0014*** **	**0.0005*** **	**0.0003*** **	0.0003	0.0000	0.0002	**0.0001** **
	(3.72)	**(5.46)**	**(4.38)**	(1.53)	(0.27)	(1.51)	**(2.16)**
Elections	-3.0084	1.3952*	**-1.9623*** **	-1.1237	**-4.4697*** **	**3.1521*** **	0.0715
	(1.05)	(1.73)	**(4.19)**	(0.69)	**(3.35)**	**(2.80)**	(0.28)
Ethnicity Factor	**13.4996*** **	**2.1004** **	**-1.9766*** **	**9.9396*** **	**3.6908*** **	-0.2547	0.0392
	(4.25)	**(2.42)**	**(4.11)**	**(5.50)**	**(2.62)**	(0.23)	(0.15)
Privatization by sale of shares	**1.4131*** **	**0.4402*** **	0.0841	**0.4765*** **	0.0675	**0.3449*** **	0.0277
	(4.44)	**(4.90)**	(1.62)	**(2.61)**	(0.46)	**(2.88)**	(0.99)
Privatization by leasing repurchace	**-3.3085** **	0.2344	-0.4839*	-0.6225	**-1.2946** **	-1.1420*	**0.3101*** **
	(1.99)	(0.51)	(1.89)	(0.73)	**(1.98)**	(1.93)	**(2.66)**
UCGI (overall)							**0.0050*** **
							(5.31)
Constant	**58.9651*** **	**2.7039*** **	**9.1975*** **	**11.1733*** **	**16.8700*** **	**19.0203*** **	**5.1023*** **
	(26.51)	**(4.37)**	**(25.62)**	**(8.72)**	**(17.13)**	**(21.59)**	**(22.24)**
Other Control Variables	yes	yes	Yes	yes	yes	yes	Yes
Observations	8474	8474	8474	8474	8474	8474	8474
Adjusted R-squared	0.06	0.07	0.09	0.07	0.05	0.03	0.51

Table 7. 2SLS and 2S GMM for Corporate Governance Index

The regression of logarithm of Net Revenues on overall corporate governance index, CGI, is estimated using two-stage OLS and two-stage GMM regressions. We employ generalized method of moments (GMM) approach (Baum, Schaffer and Stillman (2003)) to address the heteroskedasticity of unknown form (see heteroskedasticity test statistic below). We use four instruments: political diversity, ethnic diversity, religion and method of privatisation by sale of shares. Equations (1) and (3) regress UCGI on four instruments plus all other exogenous variables. Equations (2) and (4) are estimated using fitted values for UCGI from equations (1) and (3) respectively. Other control variables are the same as in our base OLS regression. We also exclude from estimation the outliers identified by method of Hadi (1994) (around 16.82% of observations). *, **, *** respectively indicate significance levels at 10%, 5%, and 1% levels. Statistically significant results (at 5% level or better) are shown in **boldface**. Absolute value of z statistics are given in parentheses.

	2SLS		2SGMM	
	(1)	(2)	(3)	(4)
	UCGI (overall)	**lnoutput**	**UCGI (overall)**	**lnoutput**
Elections	-3.3261		-3.3371	
	(1.13)		(-1.16)	
Religion	**0.0013*** **		**0.0013*** **	
	(3.70)		**(3.70)**	
Ethnicity Factor	**13.5540*** **		**13.5619*** **	
	(4.27)		**(4.26)**	
Privatization by sale of shares	**1.5102*** **		**1.5088*** **	
	(4.79)		**(4.75)**	
log(Capital)	**0.9667*** **	**0.0461*** **	**0.9667** **	**0.0469** **
	(6.34)	**(2.67)**	**(6.31)**	**(2.21)**
log(labor)	**-1.6104*** **	**1.0529*** **	**-1.6102*** **	**1.0516*** **
	(9.25)	**(49.60)**	**(-9.23)**	**(40.80)**
UCGI (overall)		**0.0051** **		**0.0051** **
		(5.80)		**(5.65)**
Constant	**59.1272*** **	**4.0947*** **	**62. 0630*** **	**6.2336*** **
	(4.52)	**(3.21)**	**(18.79)**	**(8.10)**
Other Control Variables	yes	yes	yes	Yes
Observations	8474	8474	8474	8474
Shea Partial R2	0.0078		0.0078	
Partial R2	0.0078		0.0078	
F(4, 8451)	**16.70**		**16.13**	
P-value	**0.0000**		**0.0000**	
Sargan statistic (or Hansen J statistic)		2.661		2.442
Chi-sq(3) P-val		0.4470		0.4857
Test of endogeneity of *UCGI*				
C test:		1.972		0.835
Chi-sq (1) P-value		0.1602		0.3609
IV heteroskedasticity test using levels of IV only				
H0: Disturbance is homoskedastic				
Pagan-Hall general test statistic		414.157		
Chi-sq(22) P-value		0.0000		
Test of exogeneity/orthogonality of Labor, lnlabor				
Sargan (or Hansen J) statistic for unrestricted equation		2.532		2.313
Chi-sq(2) P-value		0.2820		0.3147
C statistic		0.129		0.129
Chi-sq(1) P-value		0.7196		0.7190

Table 8. Panel Regressions: Fixed and Random Effects

The regression of logarithm of Net Revenues on overall corporate governance index, CGI, is estimated using fixed-effects and random effects regressions. Control variables are the same as in our base OLS regression. The outliers identified by method of Hadi (1994) (around 16.82% of observations) are excluded from estimation. *, **, *** respectively indicate significance levels at 10%, 5%, and 1% levels. Statistically significant results (at 5% level or better) are shown in **boldface**. Absolute value of t statistics in parentheses.

	(1) FE lnoutput	(2) RE lnoutput
UCGI (overall)	**0.0052*** **	**0.0047*** **
	(4.68)	**(5.53)**
log(Capital)	0.0466*	**0.1326*** **
	(1.82)	**(9.35)**
log(labor)	**0.4663*** **	**0.7989*** **
	(21.49)	**(53.51)**
Constant	**10.4259*** **	**5.3160*** **
	(29.49)	**(7.32)**
Industry dummies	Time-invariant	Yes
Region dummies	Time-invariant	Yes
Year dummies	Yes	Yes
Observations	8519	8474
Number of groups	4590	4579
R-squared	0.13	

Table 9. Panel IV approach

The regression of logarithm of Net Revenues on overall corporate governance index, CGI, is estimated using two-stage within and two-stage random-effects regressions. We use four instruments: political diversity, ethnic diversity, religion and method of privatization by sale of shares. Only Religion instrumental variable is time-varying and it is the only instrument we can use for two-stage within regression. Equations (1) and (3) regress UCGI on respective instruments plus other exogenous variables. Equations (2) and (4) are estimated using fitted values for UCGI from equations (1) and (3) respectively. Other control variables are the same as in our base OLS regression. We also exclude from estimation the outliers identified by method of Hadi (1994) (around 16.82% of observations). *, **, *** respectively indicate significance levels at 10%, 5%, and 1% levels. Statistically significant results (at 5% level or better) are shown in **boldface**. Absolute value of z statistics are given in parentheses.

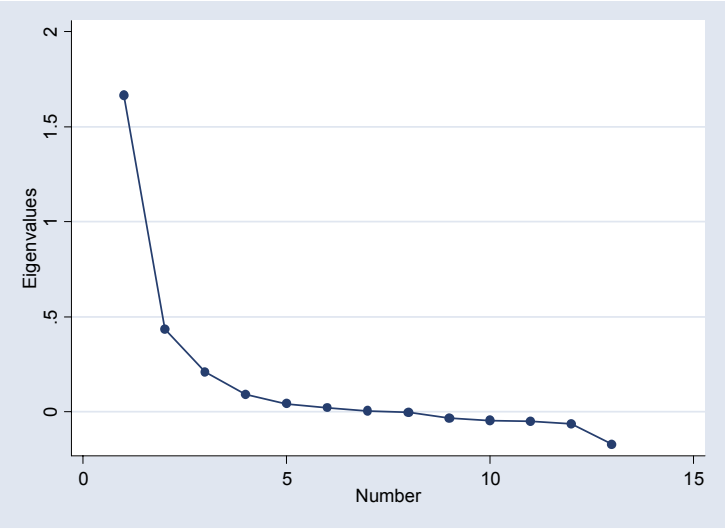
	RE (G2SLS)		FE	
	(1) First Stage	(2) Second Stage	(3) First Stage	(4) Second Stage
UCGI (overall)		**0.0487*** **		**0.0525*** **
		(3.44)		**(5.71)**
IV: Religion	**0.0015*** **		**0.0165*** **	
	(3.26)		**(9.01)**	
IV: Political Diversity	-3.0263			
	(-0.80)			
IV: Ethnic Diversity	**12.4586*** **			
	(3.06)			
IV: Method of Privatization by Sale of Shares	**1.4863*** **			
	(3.69)			
log(Capital)	**0.6066*** **	**0.0890*** **	-0.3252	0.0560*
	(3.49)	**(4.68)**	(-0.87)	(1.78)
log(labor)	**-1.0248*** **	**0.8974*** **	-0.2068	**0.4604*** **
	(-5.53)	**(41.78)**	(-0.66)	**(17.36)**
Constant	**56.5689*** **	**2.6471** **	**52.4268*** **	**7.3039*** **
	(5.76)	**(2.18)**	**(8.92)**	**(8.71)**
Observations	8479	8474	8519	8519
Number of firms		4579	4590	4590
R-sq:				
Within		0.0868	0.0270	.
Between		0.4069	0.0043	0.2020
Overall		0.3755	0.0032	0.1792
Corr(u_i, Xb)		0 (assumed)	-0.5740	-0.0849
Industry and Regional Dummies	Yes	Yes	No	No
Year dummies	Yes	yes	No	No

Table 10. Panel A. Results for Principal Factors Analysis (PFA)

The iterated principal factor method is used to analyze the correlation matrix of the elements of corporate governance quality. This method permits to re-estimate the communalities iteratively. The relatively high loadings for each factor are in **bold**.

(iterated principal factors; 1000 iterations; 5 factors retained)

Factor	Eigenvalue	Difference	Proportion	Cumulative
1	1.68459	0.76441	0.4616	0.4616
2	0.92018	0.46591	0.2522	0.7138
3	0.45428	0.0301	0.1245	0.8383
4	0.42418	0.25789	0.1162	0.9545
5	0.16629	0.11797	0.0456	1.0001
6	0.04832	0.0144	0.0132	1.0133
7	0.03391	0.00969	0.0093	1.0226
8	0.02423	0.02149	0.0066	1.0293
9	0.00273	0.0059	0.0007	1.03
10	-0.00317	0.01958	-0.0009	1.0291
11	-0.02275	0.00736	-0.0062	1.0229
12	-0.03012	0.02336	-0.0083	1.0147
13	-0.05347	.	-0.0147	1



Factor Loadings

Variable	1	2	3	4	5	Uniqueness
=1 if the annual report contains information on firm's registrar	-0.03557	**0.18595**	0.04908	**0.08605**	0.31371	0.85593
=1 if the registrar is independent	0.06481	0.01574	-0.01417	-0.06658	-0.16873	0.96245
=1 if the annual report contains information on firm's auditor	-0.11279	**0.92482**	-0.07868	-0.03801	-0.06115	0.12062
=1 if there were an annual general shareholder meeting	-0.0179	**0.07103**	**0.51357**	**0.21056**	-0.0355	0.68529
=1 if there were an extra shareholder meeting at that year	0.06751	0.01254	**0.16288**	**0.06619**	-0.08962	0.95634
=1 if the annual financial information was published properly (by Sept, 30)	-0.03935	**0.10471**	**0.28495**	**0.08676**	-0.00558	0.89873
=1 if the company has a website for communication with its stakeholders	0.02947	-0.07303	**0.07185**	0.02236	-0.05889	0.98467
= 1 if there is no nominal shareholdings in a firm	0.00184	0.00218	0.01147	0.00055	0.03353	0.99874
=1 if company's CEO does not also serve as the company's Chairman	**0.34727**	0.01964	-0.24575	**0.56202**	-0.04927	0.50034
=1 if the Chairman of Supervisory Board is not employed at the company he serves as chairman	**0.85821**	0.06125	0.01312	-0.02725	0.02105	0.25837
The percentage of unemployed directors at Supervisory Board	**0.87083**	0.0592	0.08585	-0.16857	0.0532	0.19953
= share of private ownership in a firm	-0.04002	-0.01861	0.02686	0.00793	-0.01467	0.99705
= 1 if there is no large shareholder (owner of more then 50 % shares)	-0.20504	-0.02396	-0.0071	0.09523	0.12583	0.93243

Panel B. OLS and 2SLS after PFA Analysis

Three principal factors based on PFA (see Table 8A) are chosen to represent three subindeces of corporate governance quality: Supervisory Board Subindex, Tansparency Subindex and Shareholder Rights Subindex. The regressions of logarithm of Net Revenues on the subindeces of corporate governance quality, are estimated using OLS and 2SLS. We use four instruments: political diversity, ethnic diversity, religion and method of privatization by sale of shares. Other control variables are the same as in our base OLS regression. We also exclude from estimation the outliers identified by method of Hadi (1994) (around 16.82% of observations). *, **, *** respectively indicate significance levels at 10%, 5%, and 1% levels. Statistically significant results (at 5% level or better) are shown in **boldface**. Absolute value of z statistics are given in parentheses.

	(1) OLS lnoutput	(2) 2SLS lnoutput	(3) 2SLS lnoutput	(4) 2SLS lnoutput
Supervisory Board Subindex	**0.0407*** **			0.2457
	(3.17)			(1.27)
Transparency Subindex	**0.0422*** **		**0.4737** **	
	(3.37)		**(2.07)**	
Shareholder Rights Subindex	**0.1615*** **	**0.6244*** **		
	(8.37)	**(2.62)**		
log(Capital)	**0.0671*** **	**0.0723*** **	**0.0617*** **	**0.0478** **
	(5.39)	**(5.64)**	**(4.34)**	**(2.10)**
log(labor)	**1.0229*** **	**1.0073*** **	**1.0324*** **	**1.0545*** **
	(71.10)	**(65.34)**	**(61.91)**	**(33.46)**
Constant	**7.8022*** **	**8.0987*** **	**7.9578*** **	**7.6169*** **
	(19.16)	**(17.96)**	**(17.38)**	**(18.24)**
Observations	8474	8474	8474	8474
Shea Partial R2		0.0070	0.0034	0.0046
Partial R2		0.0070	0.0034	
F(4, 8451)		**14.80**	**7.26**	**9.76**
P-value		**0.0000**	**0.0000**	**0.0000**
Sargan statistic (or Hansen J statistic)		0.287	2.329	5.730
Chi-sq(3) P-val		0.9625	0.50690	0.1255
Test of endogeneity of corp.gov. variable				
C test:		**4.377**	**4.55**	1.159
P-value		**0.0364**	**0.0329**	0.2816

Panel C. Random Effects (RE) and Fixed Effects (FE) Instrumental Variables Analysis after PFA

Three principal factors based on PFA (see Table 8A) are chosen to represent three sub-indices of corporate governance quality: Supervisory Board Sub-index, Transparency Sub-index and Shareholder Rights Sub-index. The regressions of logarithm of Net Revenues on the sub-indices of corporate governance quality are estimated using FE IV and RE IV Analysis. We use four instruments: political diversity, ethnic diversity, religion and method of privatisation by sale of shares. Other control variables are the same as in our base OLS regression. For FE regressions we use only one instrument, Religion, since others are time-invariant. We also exclude from estimation the outliers identified by method of Hadi (1994) (around 16.82% of observations). *, **, *** respectively indicate significance levels at 10%, 5%, and 1% levels. Statistically significant results (at 5% level or better) are shown in **boldface**. Absolute value of z statistics are given in parentheses.

	RE IV Analysis			FE IV Analysis		
	(1)	(2)	(3)	(4)	(5)	(6)
	lnoutput	lnoutput	lnoutput	lnoutput	lnoutput	lnoutput
Shareholder Rights Subindex			**1.2601*** **			**0.3762*** **
			(3.16)			**(6.55)**
Transparency Subindex		0.5465*			**1.5203*** **	
		(1.90)			**(3.01)**	
Supervisory Board Subinex	**0.6991** **			**2.1472*** **		
	(2.56)			**(3.42)**		
log(Capital)	**0.0911*** **	**0.1298*** **	**0.1316*** **	**0.0418**	**0.1035**	**0.0541** **
	(3.87)	**(7.89)**	**(7.24)**	**(0.80)**	**(1.59)**	**(1.97)**
log(labor)	**0.8651*** **	**0.8108*** **	**0.8219*** **	**0.5119*** **	**0.4869*** **	**0.4607*** **
	(28.20)	**(45.48)**	**(39.12)**	**(9.82)**	**(8.96)**	**(19.92)**
Constant	**5.3711*** **	**5.6937*** **	**7.6213*** **	**10.6925*** **	**9.9334*** **	**10.7417*** **
	(6.44)	**(6.76)**	**(6.22)**	**(14.88)**	**(10.69)**	**(28.86)**
R-sq:						
Within	0.0771	0.0571	0.0401	.	.	0.0217
Between	0.3773	0.4236	0.4033	0.0323	0.0799	0.4409
Overall	0.3503	0.3944	0.3520	0.0291	0.0681	0.4035
Observations	8474	8474	8474	8519	8519	8519
Number of OKPO	4579	4579	4579	4590	4590	4590

Table 11. OECD Corporate Governance Principles: Summary

N	OECD Principles and Individual Elements of Corporate Governance
	OECD Principle I. The corporate governance framework should protect the rights of shareholders to:
1	Secure methods of ownership registration
2	Convey or transfer the shares
3	Obtain relevant information on the corporation
4	Participate and vote in general shareholder meeting
5	Elect members of the board
6	Share in the profit of corporation
	Principle II. The corporate governance framework should ensure the equitable treatment of all shareholders, including minority and foreign shareholders. All shareholders should have the opportunity to obtain effective redress for violation of their rights.
1	All shareholders of the same class should be treated equally.
2	Insider trading and abusive self-dealing should be prohibited
3	Members of the board and managers should be required to disclose any material interests in transactions or matters affecting the corporation.
	III. The corporate governance framework should recognize the rights of stakeholders as established by law and encourage active co-operation between corporations and stakeholders in creating wealth, jobs, and the sustainability of financially sound enterprises.
1	Stakeholders should have the opportunity to obtain effective redress for violation of their rights
2	The corporate governance framework should permit performance-enhancing mechanisms for stakeholder participation
3	They should have access to relevant information
	IV. The corporate governance framework should ensure that timely and accurate disclosure is made on all material matters regarding the corporation, including the financial situation, performance, ownership, and governance of the company.
1	Disclosure should include all important material information
2	Information should be prepared, audited, and disclosed in accordance with relevant high quality standards
3	An annual audit should be conducted by an independent auditor
4	Channels for disseminating information should provide for fair, timely and cost-efficient access to relevant information by users
	V. The corporate governance framework should ensure the strategic guidance of the company, the effective monitoring of management by the board, and the board's accountability to the company and the shareholders.
1	Board members should act on a fully informed basis, in good faith, with due diligence and care, and in the best interest of the company and the shareholders.
2	The board should be able to exercise objective judgment on corporate affairs independent, in particular, from management.
3	Board members should have access to accurate, relevant and timely information.

Table 12. S&P's Corporate Governance Scoring Criteria: Summary

	Components and elements	Criteria
Component 1. Ownership Structure and Influence		
	Transparency and ownership	• Adequate public information on the company's ownership structure, including information on beneficial ownership behind corporate nominee holdings. • Ownership structure should not be obscured by cross-holdings, etc.
	Concentration and influence of ownership	• Large blockholders should not expropriate rights of other stakeholders. • Influence of controlling shareholders should not occur through block holdings of key operating subsidiaries. • Shareholders should not be disadvantaged by management and insider shareholders who are shielded from accountability.
Component 2. Financial Stakeholder Rights and Relations		
	Voting and shareholder meeting procedures (including regularity, ease of access to, information provided, etc.)	• Shareholders holding an appropriate percentage of voting rights should be able to call a special meeting and shareholders should have the opportunity to ask questions of the board during the meeting and to place items on the agenda beforehand. • A shareholders' assembly should be able to control appropriate decisions through processes that ensure participation by all shareholders. • The processes and procedures used for advising shareholders of general meetings should provide for equal access of all shareholders and should ensure that shareholders are furnished with sufficient and timely information so that they are able to make informed voting decisions.
	Ownership and financial rights (including dividends, ability to exercise rights, registration and transferability of shares)	• There should be secure methods of ownership of shares and full transferability of shares. • A company's share structure and control rights attached to shares should be clear. • A shareholders' assembly should be able to exercise decision rights in key areas, and procedures should be in place that ensure that minority shareholders are protected against dilution or other loss of value (e.g. through related party transactions on non-commercial terms) • All common shareholders should receive equal financial treatment including the receipt of an equitable share of profits (i.e. dividends or other profit distributions).
	Takeover defenses	• The company should maintain a level playing field for corporate control, and should be open to changes in management and ownership that provide increased shareholder value. • Takeover defenses are analyzed against the current ownership structure to determine how virulent or benign they are in practice and how the board intends to use them to increase shareholder value.
Component 3. Financial Transparency and Information Disclosure		
	Quality of content of public disclosure	• Financial reporting and disclosure should be clearly articulated and completed to a high standard.

	Timing of, and access to, public disclosure	• All publicly disclosable information should be promptly available and freely accessible to the investment community and shareholders. Public disclosure is a function of internal transparency and effective internal control policies. • The company's by-laws, statutes and/or articles should be clearly articulated and readily accessible to all shareholders. • The company should maintain a website and make company reports, summary reports and / or other investor relevant information available in English and the local language, if applicable.
	Independence and integrity of audit process	• Auditors should be independent of the board and management in all material respects. They should also be reputable. • There should be procedures in place to maintain the independence of the outside auditors.
Component 4. Board Structure and Process		
	Board structure and composition	• A board should be structured in such a way as to ensure that the interests of all the shareholders may be represented fairly and objectively.
	Role and effectiveness of board	• The board should bear overall accountability for the performance of the company. • The board should be ultimately responsible for the system of internal risk control at a company.
	Role and independence of outside directors	• An appropriate proportion of the nonemployed directors should be truly independent and act as such. • Independent or outside directors should ensure that the long-term interests of all shareholders are represented by including that the interests of other stakeholders are duly taken into account. • Directors should be elected under a transparent system in which they are not able to participate.
	Director and executive compensation, evaluation and succession policies	• Directors and executives should be fairly remunerated and motivated to ensure the long-term success of the company. • Appropriate incentives should be in place connecting executive pay to the performance of the company. • There should be clearly articulated performance evaluation and succession policies/plans for employed directors of the company.