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Corporate-Governance Ratings and Company Performance: A Cross-European Study

Annelies Renders,* Ann Gaeremynck, and Piet Sercu

ABSTRACT

Manuscript Type: Empirical

Research Question/Issue: Prior studies have failed to unequivocally establish a positive relationship between corporate-governance ratings and company performance, although theoretically, we would expect to find one. In this paper, we try to establish whether a positive relationship exists through modeling the relationship more carefully.

Research Findings/Insights: After controlling for selection bias and endogeneity simultaneously, we find a significant positive relationship between corporate-governance ratings and performance. However, the strength of this relationship seems to depend on the quality of the institutional environment. Finally, we find that improvements in corporate-governance ratings over time result in decreasing marginal benefits in terms of performance.

Theoretical/Academic Implications: Our paper contributes to the literature by showing that improved corporate-governance ratings lead to better performance, but that econometric problems might obscure this relationship. We also show that for a sample of developed countries the institutional environment affects the relationship between governance ratings and performance. Finally, this paper contributes to the literature on the impact, regarding compliance and effectiveness, of codes of good governance.

Practitioner/Policy Implications: Our results are relevant for both companies and policy makers. They indicate that companies can improve performance by adhering to good corporate-governance practices. For policy makers, the findings suggest that soft laws and the invisible hand of the market lead to companies improving their corporate governance.

Keywords: Corporate Governance, Performance, Europe, Institutions, Econometrics

INTRODUCTION

Based on agency theory (Jensen & Meckling, 1976), a positive relationship between corporate-governance ratings and company performance should exist. To the extent that higher corporate-governance ratings proxy for better actual corporate-governance practices,¹ higher corporate-governance ratings should translate into improved operating performance and a higher market value. Better monitoring forces insiders to invest in projects with a positive net present value and to reduce perks and waste, so that more of the benefits flow back to outside investors (Shleifer & Vishny, 1997). Even though prior empirical literature is extensive, many studies have thus far failed to establish firm evidence that corporate-governance

ratings, devised either by rating agencies or by researchers, positively affect company performance or value.² There are a number of reasons that may explain why this is the case. The relationship may be obscured by econometric problems, such as endogeneity, selection bias, or lack of statistical power. Secondly, there may simply be no relationship either because corporate-governance ratings do not measure what they claim to measure or because a company chooses governance practices based on its characteristics, thereby maximizing shareholder value.³ This paper aims to avoid the above mentioned econometric problems by: (1) controlling for both sample-selection bias and endogeneity; (2) adding statistical power by introducing more variation in the regressor (the corporate-governance ratings), across institutional settings, companies, and time; and (3) refining the modeling of the relationship. In doing so, we add to the corporate-governance literature by showing how a modeling technique can be used to improve empirical results. If we still do not find a link between corporate-governance ratings and

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company performance, then corporate-governance practices are either value-maximizing or corporate-governance ratings have no relevance.

We control for sample-selection and endogeneity bias in the design of the model. The sample-selection issue arises because often only the largest listed companies are rated, which means that most studies analyze a sample that is truncated in size. Size is related to both performance and corporate governance, so without addressing this size-based selection effect the link between corporate-governance ratings and performance is difficult to infer correctly (Vella, 1998). The endogeneity of the relationship between corporate governance and performance arises because performance, and especially poor performance, may cause changes in governance, which results in a two-way causality problem. Bhagat and Bolton (2007) show that controlling for endogeneity is relevant – they find a significant positive relationship between corporate governance and operating performance only when they control for endogeneity. Nobody, to our knowledge, controls for both biases simultaneously.⁴ We are convinced that controlling for both is necessary – some of our conclusions depend on whether or not one takes into account not just endogeneity, but also sample-selection bias.⁵

To obtain more variation in the cross-section of corporate-governance ratings, we study a panel of European data, instead of the US samples that most prior studies have analyzed. One reason why a European sample may offer more statistical power is that legal and regulatory requirements differ across countries, which in itself generates cross-sectional variation in corporate-governance ratings. Furthermore, corporate-governance recommendations issued at country level are largely voluntary, allowing companies to signal their compliance with governance standards, which again creates variation in the ratings.

By opting for a panel instead of a cross-sectional approach, we add power to the design. Corporate-governance practices, even though they remain voluntary in Europe, have somewhat improved during our sample period, namely the period 1999–2003. These were the years when corporate governance came to the fore – big accounting scandals in a number of countries stimulated more shareholder scrutiny and led to the introduction of corporate-governance codes in Europe, which were widely adopted by firms even when not mandatory (Conyon & Mallin, 1997; Weir & Laing, 2000). This is also evident in the increase in governance ratings over time (see Table 4).

Lastly, in terms of modeling, some progress can be made by not imposing a uniform relation across firms and over time. We allow the relationship to vary with the extent of shareholder-protection laws (Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008) and in the longitudinal dimension we keep track of changes over time.

Our results indicate that, after controlling for sample-selection bias and endogeneity, corporate-governance ratings have a highly significant and positive impact on performance, whereas they have only an insignificant or even a negative impact when we do not control for these econometric problems. So controlling for sample-selection bias and endogeneity simultaneously is relevant. With regard to the degree of the bias, we find that, at least in our sample, selection bias and endogeneity have a comparable influence

on the bias in the regression coefficient for corporate governance. After controlling only for endogeneity, for instance, we no longer find a relationship between corporate-governance ratings and operating performance. Regarding market measures of performance, in contrast, we do find a positive relationship after controlling for either selection bias or endogeneity. This relationship still becomes much stronger after simultaneously controlling for both problems.

Next, we find that companies in countries with strong shareholder-protection laws or extensive corporate-governance recommendations have higher corporate-governance ratings and the effect on performance is smaller in comparison to countries with weak shareholder-protection regulations. Up to now, the impact of the institutional environment has only been documented with regard to emerging countries (Durnev & Kim, 2005; Klapper & Love, 2004).

Finally, our results show that the relationship between corporate-governance ratings and performance has become weaker over time. This may suggest that the governance of companies does not have to be regulated by law, but can be left to the “invisible hand” of the market (Chhaochharia & Laeven, 2008; De Jong, De Jong, Mertens, & Wasley, 2005; MacNeil & Li, 2006).

This paper is organized as follows. The following section reviews the literature on the relation between corporate governance and performance. The research design is presented in the third section. In the fourth section we describe the sample and data. Sections five and six present the primary findings and the results from robustness tests. The final section summarizes the findings.

RELATED LITERATURE

In the literature on agency conflicts it is argued that managers and corporate insiders have different objectives than outside investors and will act in their own best interest whenever they have the opportunity, usually at the expense of the outside investors (Jensen & Meckling, 1976). Such opportunities are more likely to arise in companies with poor governance, characterized by the absence of effective monitoring and disciplining mechanisms. Company insiders in these companies are more likely to adopt suboptimal strategies, manipulate performance measures, resist takeovers, and expropriate value (Shleifer & Vishny, 1997) and, as a consequence, these firms often exhibit significant underperformance (e.g., Core, Guay, & Rusticus, 2006; Gompers, Ishii, & Metrick, 2001). By installing good governance practices, companies can reduce the agency costs and curtail this suboptimal behavior. This should result in improved company performance. So on the basis of agency theory we expect to find a positive relationship between company performance and corporate-governance ratings, which we use as a proxy for corporate-governance practices.

However, the findings of prior empirical studies investigating the relationship between corporate-governance ratings and firm value or performance are mixed. As far as emerging countries are concerned, they show that corporate-governance ratings have a significant positive impact on market value (Black, 2001; Black, Jang, & Kim,

2006; Durnev & Kim, 2005; Gary & Gonzalez, 2008; Khanchel El Mehdi, 2007; Klapper & Love, 2004). However, they disagree on the impact of corporate-governance ratings on accounting measures (Black et al., 2006; Klapper & Love, 2004). Regarding developed countries, the findings are even more contradictory. In a US setting, Gompers et al. (2001) documents a strong correlation between anti-takeover measures and Tobin's Q, whereas Larcker, Richardson, and Tuna (2007) finds only weak evidence of a relationship between corporate-governance ratings and market value. Bhagat and Bolton (2007) finds, after controlling for endogeneity, a positive link between a number of corporate-governance measures and operating performance, but no evidence of a relationship with stock performance or market value. This study also shows that controlling for endogeneity is relevant, as it finds no relation between corporate-governance ratings and operating performance when endogeneity is not controlled for. Brown and Caylor (2006) finds evidence of a positive effect on Tobin's Q, while Daines, Gow, and Larcker (2008) finds no consistent relationship between various commercial ratings and performance measures. For a sample of FTSEurofirst 300 companies, Bauer, Gunster, and Otten (2004) establishes no significant relationship between corporate-governance ratings and either market or accounting performance measures and in some cases even a negative relation. In contrast, Drobetz, Schillhofer, and Zimmermann (2004) documents a positive impact of corporate-governance ratings on the market value of German companies. Table 1 gives an overview of these prior studies.

The lack of consistent results in prior studies could be attributable to failure to simultaneously control for sample-selection bias and endogeneity. First, none of the prior studies tests or corrects for sample-selection bias although most of the samples used include only the largest listed firms.⁶ The use of such truncated samples can have as a consequence that the average characteristics of the sample differ from those of the population (Vella, 1998). Without addressing this selection effect, the association between corporate-governance ratings and performance may be inferred incorrectly, as the impact of corporate governance may be confounded with the impact of parameters that determine the selection (Heckman, 1976, 1979).

Second, in prior studies the endogeneity problem, i.e., reverse causality between corporate-governance ratings and firm performance (Bhagat & Black, 2002),⁷ is either not addressed or not properly controlled for. A common technique to tackle the endogeneity problem is the use of instrumental variables. A number of prior studies have employed this technique using as instruments among others legal origin (Durnev & Kim, 2005), market segment indicator variables (Drobetz et al., 2004), and size (Black et al., 2006). These instruments are, however, only weakly correlated with corporate-governance ratings, which leads to inefficient instrumental-variable (IV) estimates (Bhagat & Bolton, 2007; Bound, Jaeger, & Baker, 1995; Larcker & Rusticus, 2008; Nelson & Startz, 1990). Prior studies may have failed to remedy the endogeneity problem and have generally ignored the problem of selection bias.

The lack of significant results is particularly evident in studies on US data. So another reason for the absence of

significant results may be that prior studies have used a setting in which there is little variation in the corporate-governance ratings (Black, 2001), resulting in a lack of statistical power in the tests. The US is an environment with a high level of investor protection, which results in companies adhering to high levels of corporate governance. In contrast, a European sample may offer more power as the legal and regulatory requirements differ from country to country, which contributes to the cross-sectional variation in corporate-governance ratings. But even within a country one can expect more variability, as a result of a number of institutional features. First, European companies are characterized by concentrated ownership structures (Becht & Roell, 1999; Faccio & Lang, 2002) and by large private benefits for company insiders (Dyck & Zingales, 2004; Nenova, 2003). In addition, corporate-governance codes and recommendations are largely voluntary (Wymeersch, 2006; Zattoni & Cuomo, 2008); legal investor protection is weaker than in the US (La Porta, Lopez-de-silanes, Shleifer, & Vishny, 1998); and an active takeover market – a mechanism that would have helped to correct sub-optimal governance choices – is largely absent in Europe (Mikkelsen & Partch, 1997). In companies with concentrated ownership structures, company insiders have more discretion to make corporate-governance decisions that maximize insiders' wealth instead of shareholder value. This results in low governance standards (Aggarwal, Erel, Stulz, & Williamson, 2007). But not all European firms belong to this category. Firms with a dispersed shareholder base, for instance, probably have better corporate-governance practices. Furthermore, even in blockholder-dominated companies, shareholder scrutiny has recently led to improved corporate-governance charters and structures and companies can signal their adherence to low private benefits by implementing corporate-governance recommendations. One would expect that any improvement in the corporate-governance practices of firms should be beneficial for market value and operating performance. Better monitoring, for instance, by an independent board of directors forces insiders to invest in projects with a positive net present value and to reduce perks and waste, so that outside investors reap more of the benefits (Shleifer & Vishny, 1997).

A number of prior studies in emerging countries show that companies use the weak legal environment and the leeway in corporate-governance recommendations to signal their quality (Durnev & Kim, 2005; Klapper & Love, 2004). These studies also find that corporate-governance ratings are higher and have a stronger impact on performance in countries with weak legal institutions. In other words, the weak investor protection allows firms to differentiate themselves by adopting good corporate governance, which is translated in higher firm values. As we have different institutional environments in our sample, we also expect the relationship between corporate-governance ratings and performance to depend on the institutional environment.

RESEARCH DESIGN

Model Structure

To control for both sample-selection bias and endogeneity, we follow the three-stage model developed by Mroz (1987),

TABLE 1
Literature Overview

Author(s)	Sample	Time period	CG measures	Findings	Design attributes
Black (2001)	21 Russian firms	1999	CG rankings from a Russian investment bank	Positive correlation with firm value	–
Klapper and Love (2004)	374 companies in 14 emerging markets	1999	CLSA CG ratings	Positive association with ROA and firm value	–
Durnev and Kim (2005)	859 companies in 27 countries	1999–2001	CLSA CG ratings	Positive relationship with firm value	Sample selection bias and endogeneity separately
Black et al. (2006)	515 Korean listed companies	2001	Self-constructed CG rating	Positive association with market value	Controls for endogeneity using 2SLS and 3SLS
Khanchel El Mehdi (2007)	24 listed Tunisian companies	2000–2005	8 different CG variables	Positive relationship with marginal market value	Random effects
Gary and Gonzalez (2008)	46 listed Venezuelan companies	2004	Self-constructed CG rating	Positive relationship with firm value	Controls for endogeneity
Gompers et al. (2001)	1,500 US listed firms	1990–1999	G-score of 24 anti-takeover measures	Positive relationship with stock returns	–
Larcker et al. (2007)	2,106 US listed companies	2002	14 different CG factors	Some association with operating performance and stock returns	Controls for endogeneity as a robustness check
Bhagat and Bolton (2007)	US listed companies	Different time periods	Different CG measures	Positive relation with operating performance	Simultaneous equations
Daines et al. (2008)	US listed firms	2005–2007	ISS, GMI, TCL and AGR ratings	Limited evidence of a relationship with performance and firm value	–
Bauer et al. (2004)	250 firms included in FTSEurofirst 300	2000	Deminor ratings	Negative relationship with firm performance	–
Drobetz et al. (2004)	91 German listed companies	1998–2002	Ratings based on 30 principles	Positive association with firm value	Controls for endogeneity using 2SLS
Brown and Caylor (2006)	1,868 US listed firms	2003	Ratings based on ISS data	Some provisions related with firm value	Tests for reverse causality

in which a selection equation precedes the 2SLS estimation and provides the Inverse Mills Ratio (*IMR*) for the actual estimation:

Selection Equation

$$E(1_j^{sel}) = \text{Probit}(\text{exclusion variables, control variables}). \quad (1)$$

Corporate Governance Equation – Instrumenting

$$E(Gov_j) = f(\text{Instruments, } IMR_j, \text{ control variables}). \quad (2)$$

Main Test Equation

$$E(Perf_j) = f(\widehat{Gov}_j, IMR_j, \text{ control variables}). \quad (3)$$

We denote

- 1_j^{sel} dummy indicating whether firm j is included in the FTSEurofirst 300 index ($1_j^{sel} = 1$) or not ($= 0$)
- Gov_j j 's Deminor rating on corporate governance
- \widehat{Gov}_j j 's fitted Gov rating in the iv regression
- $Perf_j$ a measure of performance for firm j
- IMR_j j 's Inverse Mill's Ratio from the selection equation

Below we define the variables that are used in the equations.

Variables

Performance Measures (*Perf_j*). With regard to the impact of corporate-governance ratings on company performance, prior findings are contradictory. For this reason we measure performance in Equation 3 by means of five alternative criteria: Tobin's q (Q); market-to-sales ratio (MtS); market-to-book value (MtB); return on assets (RoA); and return on equity (RoE).

Corporate-Governance Rating (*Gov_j*). We use the corporate-governance data of Deminor Rating. Every year, Deminor Rating assesses the companies included in the FTSEurofirst 300 index – the largest 300 European companies included in the major indices in Europe (FTSEurofirst, 2006). The ratings are based on a corporate-governance grid comprising over 300 criteria. The following criteria are used: board structure and functioning, anti-takeover mechanisms, shareholder rights, and disclosure on corporate governance. The maximum score is 40. It is common in the literature to use additive indices (e.g., Aggarwal et al., 2007; Durnev & Kim, 2005; Gompers et al., 2001; Klapper & Love, 2004). Other recent studies using Deminor ratings are Vander Bauwhede and Willekens (2008), and Khanna, Kogan, and Palepu (2006).

Control Variables. The control variables used in all three regressions are similar to those employed in related studies (Bhagat & Black, 2002; Black et al., 2006; Durnev & Kim, 2005; Klapper & Love, 2004; Larcker et al., 2007). All but one are at the company level; the last one refers to the company's home country.

$\ln(V)$	natural log of market value of equity
$\ln(Age)$	natural log of company's age (in 2003)
$Grow$	average growth in sales over the previous three years
Lev	leverage (total debt over equity)
$Conc$	ownership concentration (number of closely-held shares over total shares outstanding)
$CapInt$	capital-intensity ratio (proportion of fixed assets)
$1_{Y<0}$	indicator of negative net income
1_{Acc}	indicating the use of international accounting standards (IFRS or US GAAP)
$Protctn$	shareholder protection (anti-self dealing index by Djankov, La Porta, Lopez-de-silanes, and Shleifer (2008))

We interact the Djankov et al. (2008) anti-self dealing index, *Protctn*, with the fitted corporate-governance variable estimated from Equation 2. Firm-level governance and country-level governance are closely related, but there is some debate whether they are substitutes or complements. Doidge, Karolyi, and Stulz (2007) finds that in countries with weak institutions, governance at firm and at country-level are complements. If the government does not provide a reliable legal and financial framework, it is too costly for firms to bond themselves to better governance, since they cannot guarantee investor protection. However, other studies conclude that corporate governance at corporate level is a substitute for good governance at country level. Klapper and Love (2004) and Durnev and Kim (2005) state that in countries with weak legal institutions, firms develop alternative solutions to guarantee investor protection, such as establishing good corporate-governance practices. In other words, in a country with high governance standards, improvements at company level probably add less than they would do in a country with low standards. We test (1) in what type of country companies are more likely to voluntarily adopt improvements (from the results of Equation 2), and (2) in what type of country any improvements are most beneficial (from Equation 3).

Finally, we control for year- and industry-fixed effects (Bhagat & Black, 2002; Klapper & Love, 2004). To study the effect of corporate-governance ratings on performance over time, we interact in Equation 3 the fitted corporate-governance ratings with the year-fixed effects.

Instruments. In the instrumenting Equation 2, we need instruments for the corporate-governance ratings. A good instrument has a strong correlation with the endogenous variable but is not correlated with the error term of the structural equation; it is exogenous. In practice, however, it is difficult to identify such an instrument (Maddala, 1977). Most empirical studies use "imperfect" instruments. They either are exogenous but have a low correlation with the endogenous variable ("weak instruments"), or are partially endogenous but have a high correlation with the endogenous variable ("semi-endogenous" or "quasi-instrumental" variables) (Larcker & Rusticus, 2008). Earlier corporate-

governance studies (Black et al., 2006; Drobetz et al., 2004; Durnev & Kim, 2005) have relied mostly on weak instruments. This may result in a bias that is larger than the bias from OLS estimation (Bound et al., 1995; Nelson & Startz, 1990). For this reason we use semi-endogenous instruments. These instruments should meet two conditions in order to ensure a lower bias than the OLS estimation (Larcker & Rusticus, 2008). First, the correlation between the instrument and the endogenous variable should be high. Second, the endogeneity of the instrument should be lower than the endogeneity of the original endogenous regressor.

Because we use panel data over multiple countries, we are able to combine a country-level with a company-level instrument. As a first instrument, we draw up a rating for the corporate-governance recommendations or codes of good governance at country level (*Code*). More specifically, we rate countries on the comprehensiveness of their corporate-governance recommendations, checking whether each of the 50 principles listed in the OECD Principles of Corporate Governance (OECD, 1999) (see Appendix Table A1 for an overview) is included and counting the ticks. Data on the countries' codes are available from the European Corporate Governance Institute (ECGI, 2005) and the European Commission (EC, 2002). We measure *Code* at the beginning of each year to ensure that the companies had ample time to incorporate the recommendations. For instance, the country's score for 2003 is based on the corporate-governance codes available in January 2003. This instrument meets the abovementioned conditions. First of all, it is correlated with the corporate-governance practices of companies. The use of the "comply-or-explain" principle puts pressure on companies to comply with the codes (Akkermans et al., 2007; Conyon & Mallin, 1997; Weir & Laing, 2000; Werder, Talauhar, & Kolat, 2005). Concerning the endogeneity of this instrument, it is probably exogenous because company performance is not directly related to the recommendations drawn up at country level.

As the second instrument we use corporate-governance ratings, lagged one year (Gov_{-1}). This instrument is strongly correlated with the current ratings, as it is difficult to reverse corporate-governance practices once they have been implemented. Past governance ratings can have a simultaneity relation with past performance, which may, in turn, correlate with current performance. The endogeneity of this instrument in relation with current performance depends in this case on the autocorrelation in performance. But prior literature finds that this autocorrelation is weak (e.g., Little, 1962; Rayner & Little, 1966); also in our dataset the autocorrelations are below 29 per cent.

All IV estimations in this paper pass the tests for weak instruments (Stock & Yogo, 2004), the Hausman (1978) test for endogeneity, and the Hansen-Sargan overidentifying restrictions test.

Exclusion Variables. Finally, some so-called exclusion-restriction variables are added to Equation 1. These are exogenous variables that explain why a company is included in the FTSEurofirst index and that are not included in Equations 2 or 3. First, we add two company-level variables: the number of stock exchanges a company is listed on ($\#Lst$) and

the percentage of intangible assets ($\%Intan$). Companies listed on more stock exchanges and companies with more intangible assets tend to have higher market values and as a consequence are more likely to be included in the FTSEurofirst 300 index.

We add two country-level variables in order to control for any differences between countries in the selection process – the natural log of GDP per capita ($lnGDP$) and the ratio of stock market capitalization over GDP ($MCap$) (Doidge et al., 2007). Countries with a higher level of financial and economic development have larger listed companies (Shleifer & Wolfenzon, 2002), suggesting a higher probability of being included in the FTSEurofirst 300 index.

SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

We use two samples to estimate our three-stage model. The sample used in the 2SLS Equations 2 and 3 consists of the EU companies included in the FTSEurofirst 300 for which we have corporate-governance ratings from Deminor Rating and financial data from Worldscope. Our sample period spans 5 years, from 1999 to 2003. Table 2 Panel A provides an overview of the FTSEurofirst 300 sample by country and year. Companies about which Worldscope does not have financial information are excluded from the sample, as are investment funds. The FTSE sample consists of 1,199 firm-year observations across 14 countries, but as we use lagged ratings as an instrument, the sample is reduced to 938 firm-year observations, from the period 2000-03.

In contrast, the sample used in Equation 1 consists of all companies that are both listed in any of the 14 EU countries and included in Worldscope, in any year between 1999 and 2003. It includes the companies from the FTSEurofirst sample. Table 2 Panel B provides an overview of this Worldscope sample per country and year. We have a total of 33,667 firm-year observations, after excluding investment funds and companies with a negative book value of equity. To mitigate the impact of outliers, for each variable we treat as missing observations any numbers that are in the top and bottom one percent of the ranked observations. The FTSEurofirst sample covers a mere 3.6 per cent of the Worldscope sample; this severe reduction indicates a possible selection problem.

To document this potential selection problem, we compare in Table 3 the averages of the performance measures, exclusion variables, and control regressors of the Worldscope sample with those of the FTSEurofirst sample. Large differences may indicate that a selection bias is present (Vella, 1998). Table 3 reveals that the FTSE companies on average perform much better than the Worldscope companies in both accounting as well as market-return terms. Tests on the differences of the means also show that the FTSE companies are on average larger, older, more leveraged and less concentrated in ownership than the Worldscope sample. They also have a lower growth in sales, a higher percentage of intangible assets and are listed on more stock exchanges. A larger fraction of the FTSE companies use international accounting standards (US GAAP or IFRS), and losses do not occur as often as among general Worldscope companies.

TABLE 2
Sample Overview

Panel A: FTSE Sample						
	1999	2000	2001	2002	2003	Total
AUSTRIA	0	0	1	2	2	5
BELGIUM	7	9	10	9	9	44
DENMARK	2	4	7	4	4	21
FINLAND	4	5	6	5	5	25
FRANCE	42	39	37	38	41	197
GERMANY	24	26	32	30	32	144
GREECE	3	0	3	4	6	16
IRELAND	4	3	5	5	6	23
ITALY	22	20	22	21	24	109
NETHERLANDS	20	18	19	17	18	92
PORTUGAL	3	0	2	4	4	13
SPAIN	9	9	10	13	16	57
SWEDEN	13	17	17	18	15	80
UK	65	74	79	78	77	373
All	218	224	250	248	259	1,199

Panel B: Worldscope Sample						
	1999	2000	2001	2002	2003	Total
AUSTRIA	123	122	134	129	135	643
BELGIUM	135	130	130	133	131	659
DENMARK	217	223	226	226	223	1,115
FINLAND	172	172	173	173	175	865
FRANCE	1,039	1,025	1,038	1,015	1,021	5,138
GERMANY	1,054	1,061	1,034	1,028	1,022	5,199
GREECE	395	397	395	395	394	1,976
IRELAND	77	77	75	75	76	380
ITALY	365	371	364	361	361	1,822
NETHERLANDS	227	234	225	223	221	1,130
PORTUGAL	113	111	110	112	110	556
SPAIN	151	150	148	148	149	746
SWEDEN	449	450	445	457	440	2,241
UK	2,236	2,284	2,264	2,228	2,185	11,197
All	6,753	6,807	6,761	6,703	6,643	33,667

The FTSE sample (Panel A) includes all companies in the FTSEurofirst 300 index for which we have corporate-governance ratings from Deminor Rating. We exclude investment funds and companies with missing data in Worldscope. The Worldscope sample (Panel B) includes all listed companies with financial data in Worldscope of the 14 countries present in the FTSEurofirst 300 sample. We exclude investment funds and companies with negative book value of equity. Observations in the top and bottom first percentile for each variable are treated as missing observations.

However, the FTSE companies do not differ from the Worldscope firms with regard to the proportion of fixed assets. Finally (and unexpectedly to us), they are not domiciled in countries with a higher GDP, a relatively larger stock market capitalization, or better laws protecting minority investors from self-dealing by insiders.

Table 4 presents the average company corporate-governance rating per country and per year in Panel A; Panel B similarly reports how the country scores on its corporate-governance recommendations per year; and Panel C ranks countries on the basis of the strength of their legal investor protection. Panel A shows that the company ratings improve

TABLE 3
Comparison of the Worldscope Sample with the FTSEurofirst 300 Sample

	Worldscope	FTSEurofirst 300	Difference
<i>Performance variables</i>			
Q	1.82	1.97	-8.94***
MtS	2.15	3.00	-10.40***
MtB	3.06	3.69	-15.91***
RoA	-.01	.06	-6.66***
RoE	-.08	.13	-16.09***
<i>Control variables</i>			
Ln(V)	11.66	16.35	-127.99***
Ln(Age)	3.27	3.77	-4.52***
Grow	.25	.12	2.74**
Lev	1.30	2.64	-20.28***
Conc	.32	.21	16.04***
CapInt	.26	.26	-.15
$1_{y<0}$	.26	.03	14.09***
1_{Acc}	.05	.07	-3.36**
Protctn	.55	.55	.13
<i>Exclusion restrictions</i>			
#Lst	1.09	2.05	-47.45***
%Intan	.11	.15	-10.85***
ln(GDP)	10.00	10.02	-1.26
MCap	103.18	104.06	-1.85 ⁺

This table compares the means of the variables of the Worldscope sample with those of the FTSEurofirst sample. Two-tailed test statistics are presented. We tested first whether the variables follow a normal distribution using the Shapiro-Wilks test. We find that the performance measures, *Grow*, *Lev*, *#Lst*, *%Intan*, $1_{y<0}$, 1_{Acc} , *Protctn*, and *ln(GDP)* do not follow a normal distribution. For these variables we report Wilcoxon ranksum test statistics. For the remaining variables, we report *t*-tests. Variable definitions: *Q* = (total assets + market value of equity at year-end - book value of equity)/total assets, *MtS* = market value of equity at year-end/total sales, *MtB* = market value of equity at year-end/book value of equity, *RoA* = (net income + interest expenses)/total assets, *RoE* = net income/book value of equity, *ln(V)* = log(market value of equity at year-end), *ln(Age)* = log(2003 - year of foundation), *Grow* = average growth in sales over 3 years, *Lev* = total debt/book value of equity, *Conc* = closely held shares/total shares outstanding, *CapInt* = fixed assets/total assets, $1_{y<0}$ = 1 if the company has negative net income, = 0 otherwise, 1_{Acc} = 1 if the company uses IFRS or US GAAP, = 0 otherwise, *Protctn* = anti-self dealing index developed by Djankov et al. (2008), *#Lst* = number of stock exchanges the company is listed on, *%Intan* = intangible assets/total assets, *ln(GDP)* = ln(GDP per capita), *MCap* = total market capitalization/GDP. ***, **, *, + indicate significantly different at the .1 per cent, 1 per cent, 5 per cent, and 10 per cent level, respectively.

over time, with UK companies having on average the highest corporate-governance ratings. Panel B indicates that Austria issued a corporate-governance code as late as end 2001 while all other countries had one by 2000. The Southern European countries tend to have less extensive recommendations. The north is generally more ambitious, but the most encompassing corporate-governance recommendations are found in the UK and Ireland. This is consistent with prior research, such as Zattoni and Cuomo (2008). In line with the trend in the company ratings, also the country-level recommendations become more extensive over time. However, when we rank countries based on the strength of the legal environment (see Panel C), we do not find that countries with strong shareholder protection have developed more extensive corporate-governance recommendations. However, companies in countries with a strong legal environment are more likely to adhere to these recommendations, which is evident in the higher corporate-governance ratings.

Appendix Table A2 presents descriptive statistics for all variables in the model for the FTSEurofirst sample. We also calculated the correlations between the variables (correlations not reported). We observe a high correlation between the firms' rating *Gov* and either its lagged observation *Gov*₋₁ ($\rho = 0.71$) or its country's rating *Code* ($\rho = 0.59$), as well as the low autocorrelation in the performance measures ($\rho \leq 0.29$) - features that justify our choice of instruments. A strong correlation could also be observed between company ratings and the country's rating on protection against self-dealing ($\rho = 0.47$). This indicates that corporate-governance practices of companies complement the country's institutional environment, which is contradictory to the findings of Klapper and Love (2004) and Durnev and Kim (2005). So in countries with more extensive corporate-governance recommendations or stronger investor protection corporate-governance ratings are higher, but the effect on performance will probably be smaller.

TABLE 4
Descriptive Statistics: Companies and Countries

Panel A: Average Company Rating					
	1999	2000	2001	2002	2003
AUSTRIA	–	–	16.19	17.69	19.12
BELGIUM	15.16	15.59	17.08	18.11	18.38
DENMARK	10.41	15.36	14.60	15.76	17.58
FINLAND	21.94	21.44	20.15	22.23	24.41
FRANCE	17.68	21.05	21.31	22.46	22.44
GERMANY	18.07	19.92	18.19	18.16	20.32
GREECE	16.42	–	13.30	14.65	16.52
IRELAND	29.40	27.74	28.71	29.10	29.87
ITALY	17.08	18.82	18.54	17.86	18.88
NETHERLANDS	13.05	15.42	16.10	19.09	23.44
PORTUGAL	8.80	–	11.41	13.74	17.69
SPAIN	13.95	13.82	15.89	17.60	20.72
SWEDEN	19.04	18.34	19.22	21.54	22.44
UK	25.75	26.95	27.61	29.09	31.02
<i>Avg</i>	19.58	21.5	21.47	22.64	24.12

Panel B: Country Rating					
	1999	2000	2001	2002	2003
AUSTRIA	–	–	–	35.00	35.00
BELGIUM	29.25	29.25	29.25	30.25	30.25
DENMARK	–	16.50	28.00	28.00	31.00
FINLAND	15.00	18.25	18.25	18.25	35.00
FRANCE	28.00	28.00	28.00	35.50	35.50
GERMANY	–	28.50	28.50	41.50	41.50
GREECE	31.25	31.25	33.75	34.75	34.75
IRELAND	23.25	23.25	23.25	23.25	23.25
ITALY	23.00	23.00	23.00	33.75	33.75
NETHERLANDS	16.00	16.00	20.00	20.00	35.00
PORTUGAL	20.00	20.00	23.00	25.25	25.25
SPAIN	23.25	23.25	23.25	23.25	33.25
SWEDEN	20.50	20.50	31.00	31.00	31.00
UK	35.50	36.50	36.50	35.60	44.00
<i>Avg</i>	18.93	22.45	24.70	29.67	33.46

Panel C: Country Rankings				
	Anti-selfdealing	Country rating	Company rating	Market cap
UK	.95	34.50	28.16	152.30
IRELAND	.79	23.25	29.09	68.78
BELGIUM	.54	29.65	16.95	67.21
DENMARK	.46	20.58	15.13	59.73
FINLAND	.46	20.99	21.96	168.76
PORTUGAL	.44	22.69	13.46	45.86
ITALY	.42	27.26	18.24	54.38
<i>Avg</i>	.58	25.56	20.43	88.15
FRANCE	.38	30.97	20.93	90.27
SPAIN	.37	25.25	16.79	82.74
SWEDEN	.33	26.79	20.13	108.57
GERMANY	.28	27.85	18.98	54.84
GREECE	.22	33.15	15.43	76.28
AUSTRIA	.21	14.37	17.96	16.29
NETHERLANDS	.20	21.30	17.23	130.93
<i>Avg</i>	.28	25.67	18.21	79.99

Average company corporate-governance ratings (Panel A) are based on the ratings developed by Deminor Rating for the FTSEurofirst 300 companies (1199 firm-year observations, see Table 2 Panel A). Deminor Rating scores the companies on the basis of a grid consisting of over 300 corporate-governance criteria. The maximum score is 40. The country ratings (Panel B) were developed on the basis of a corporate-governance index which includes 50 principles gathered from the OECD principles of corporate governance (1999) (see Appendix Table A1). Each country is scored on the inclusion of these principles in its corporate governance codes at the beginning of each year. The maximum score is 50. Panel C presents the countries ranked by the Anti-self dealing index developed by Djankov et al. (2008).

TABLE 5
Benchmark Models without Controlling for Selection Bias and Endogeneity

	Q		MtS		MtB		RoA		RoE	
	coef	t-stat	coef	t-stat	coef	t-stat	coef	t-stat	coef	t-stat
<i>Cons</i>	-.71	-.40	1.95	.68	-2.31	-.61	-.06	-.46	-.11	-.29
<i>Gov</i>	.02	1.18	.03	1.46	.02	1.12	-.00	-1.17	-.00	-.33
<i>Protctn</i>	2.68 ⁺	1.90	1.80 ⁺	1.75	1.66 [*]	2.14	.22 [*]	2.05	.40 ⁺	1.93
<i>Gov x Protctn</i>	-.04	-.86	-.08	-.66	-.36	-1.33	-.01	-.90	-.01	-1.26
<i>ln(V)</i>	.17 ⁺	1.67	.13	1.14	.31	1.54	.01	1.52	.01	1.52
<i>ln(Age)</i>	-.15 ⁺	-1.85	-.31 [*]	-2.52	-.43 [*]	-1.98	-.00	-1.29	-.02 [*]	-2.30
<i>Grow</i>	.71 ⁺	1.63	1.03 ⁺	1.67	.87	1.49	.08 ⁺	1.65	.05 ⁺	1.95
<i>Lev</i>	-.07 ^{***}	-3.71	-.17 ^{***}	-3.76	-.11 ⁺	-1.65	-.00 ^{***}	-4.54	-.00	-.97
<i>Conc</i>	.17	.62	-.93	-.78	-.47	-.61	-.04	-1.35	-.09	-.96
<i>CapInt</i>	-1.01 ⁺	-1.93	-2.60 [*]	-2.30	-3.21 ^{**}	-3.24	-.00	-.64	-.05 ⁺	-1.68
<i>1_{Y<0}</i>	-.47 [*]	-2.44	-.06	-.84	-.79 ⁺	-1.82	-.15 ^{***}	-3.70	-.41 ^{**}	-3.25
<i>1_{Acc}</i>	-.10	-.46	-.24	-.62	-.21	-.34	-.00	-.76	-.02	-1.15
<i>1₁</i>	-.19	-.35	.18	.19	.53	.26	-.10	-.24	-.02	-.38
<i>1₂</i>	.51	.91	.18	.17	-.51	-.26	-.10	-.22	-.09	-1.01
<i>1₃</i>	.61	1.04	.22	.29	.13	.06	-.07	-.15	-.01	-.13
<i>1₁ x Gov</i>	.00	.01	.01	.12	-.09	-.75	.00 ⁺	1.83	-.00	-.22
<i>1₁ x Gov</i>	-.03	-.97	-.10	-1.38	-.03	-.27	.01 ⁺	1.89	-.00	-.82
<i>1₁ x Gov</i>	-.04	-1.18	-.12 ⁺	-1.66	-.06	-.52	.00	1.28	-.00	-.08
\bar{R}^2	.193		.141		.162		.176		.241	

This table presents results from OLS regressions of the performance measures on corporate-governance ratings and control variables. Regressions are estimated using the pooled FTSEurofirst sample excluding 1999 (938 firm-year observations, see Table 2 Panel A) with year and industry effects (for brevity, industry effects are not reported). Standard errors are heteroskedasticity robust, clustered at the firm level (Rogers, 1993; Petersen, 2005). The dependent variables are Tobin's Q (Q), the Market-to-Sales (MtS), the Market-to-Book Value ratio (MtB), and the returns on assets (RoA) or equity (RoE). Specifically: Q = (total assets + market value of equity at year-end - book value of equity)/total assets, MtS = market value of equity at year-end/total sales, MtB = market value of equity at year-end/book value of equity, RoA = (net income + interest expenses)/total assets, RoE = net income/book value of equity, Gov = company corporate-governance ratings from Deminor Rating, ln(V) = log(market value of equity at year-end), ln(Age) = log(2003 - year of foundation), Grow = average growth in sales over 3 years, Lev = total debt/book value of equity, Conc = closely held shares/total shares outstanding, CapInt = fixed assets/total assets, 1_{Y<0} = 1 if the company has negative net income, = 0 otherwise, 1_{Acc} = 1 if the company uses IFRS or US GAAP, = 0 otherwise, Protctn = anti-self dealing index developed by Djankov et al. (2008), 1_t = time dummy for years {1, 2, 3} versus the starting year. ***, **, *, + indicate significantly different at the .1 per cent, 1 per cent, 5 per cent, and 10 per cent level, respectively (two-tailed tests).

MULTIVARIATE RESULTS

Table 5 reports the results of benchmark OLS regressions of performance on corporate-governance ratings without controlling for sample-selection bias and endogeneity. The \bar{R}^2 range from 14 per cent for MtS to 24 per cent for RoE. Corporate-governance ratings seem to have no significant relationship with any of the performance measures: all *t*-statistics are below 1.46. In the regressions with RoA and RoE, corporate-governance ratings even have a negative coefficient (-.003 and -.001). The results indicate that the shareholder-protection index has a positive impact on market and accounting performance (*t*-statistics of 1.75 or more). However, we find no significant interaction effect between firm-level corporate-governance ratings and country-level shareholder-protection regulations ($|t| < 1.33$), nor do we see a consistent significant interaction effect between the time indicator variables and corporate-governance ratings.

The results from the three-stage model are given in Tables 6 and 7. Panel A in Table 6 provides the results from Equation 1, the selection process. The pseudo \bar{R}^2 of the model is approximately 75 per cent, which indicates that we have accurately modeled the selection process. With regard to the exclusion variables, we find that companies listed on more stock exchanges ($t = 3.13$) and with a higher percentage of intangible assets ($t = 1.85$) are more likely to be included in the FTSEurofirst index. Furthermore, companies from a country with a high GDP per capita ($t = 2.59$) or a relatively large stock market ($t = 1.86$) have a high probability of appearing in the FTSEurofirst index. Finally, the results indicate that, relative to general Worldscope firms, the FTSE companies are larger ($t = 4.03$) and older ($t = 2.10$), have a lower sales growth ($t = -3.44$), ownership concentration ($t = -3.26$), a higher debt-to-equity ratio ($t = 2.47$), and are more often situated in countries with better investor protection ($t = 3.01$).

In Panel B corporate-governance ratings are regressed on the two instruments (lagged corporate-governance ratings

TABLE 6
Results from Selection Equation and
Instrumenting Equation

Panel A: Selection Model (Probit)		
	coef	t-stat
<i>Cons</i>	-2.54 ⁺	-1.73
<i>#Lst</i>	.18**	3.13
<i>%Intan</i>	.48 ⁺	1.85
<i>ln(GDP)</i>	.34 [*]	2.59
<i>MCap</i>	.01 ⁺	1.86
<i>Protctn</i>	.27**	3.01
<i>ln(V)</i>	.88***	4.03
<i>ln(Age)</i>	.13 [*]	2.10
<i>Grow</i>	-.17***	-3.44
<i>Lev</i>	.01 [*]	2.47
<i>Conc</i>	-.55**	-3.26
<i>CapInt</i>	-.08	-.46
<i>1_{Y<0}</i>	-.08	-.76
<i>1_{Acc}</i>	.03	.65
Pseudo \bar{R}^2	.75	

Panel B: Instrumenting Model (OLS)		
	coef	t-stat
<i>Cons</i>	4.51 ⁺	1.78
<i>Gov₋₁</i>	.75***	4.80
<i>Code</i>	.06 [*]	2.05
<i>Protctn</i>	.64 ⁺	1.82
<i>ln(V)</i>	.10 [*]	2.13
<i>ln(Age)</i>	-.23**	-2.78
<i>Grow</i>	-.21	-.42
<i>Lev</i>	.01	.17
<i>Conc</i>	-2.17***	-3.88
<i>CapInt</i>	.34	.73
<i>1_{Y<0}</i>	-.64	-.27
<i>1_{Acc}</i>	.63 [*]	2.02
<i>IMR</i>	-.43	-1.22
<i>1₁</i>	.19 ⁺	1.83
<i>1₂</i>	.25 [*]	2.10
<i>1₃</i>	.60 [*]	2.37
\bar{R}^2	.84	
partial \bar{R}^2	.67	

Panel A presents results from a Probit regression which indicates whether or not Company *j* has a corporate-governance rating in year *t*. The regression is estimated using the pooled sample of Worldscope companies (33,667 observations, see Table 2, Panel B) with year and industry effects (not reported). Standard errors are heteroskedasticity robust, clustered at the firm level (Rogers, 1993; Petersen, 2005). Panel B presents results from a regression of corporate-governance ratings (*Gov*) on the instruments (*Gov₋₁* and *Code*), the shareholder-protection index (*Protctn*), the inverse Mills ratio (*IMR*) calculated from Equation 1, and control variables. The regression is estimated for the pooled sample of FTSEurofirst companies (938 observations, see Table 2, Panel A) with year and industry fixed effects (for the sake of brevity, industry effects are not reported). Standard errors are heteroskedasticity robust, clustered at the firm level (Rogers, 1993; Petersen, 2005). The partial \bar{R}^2 of the instruments is computed. Variable definitions: *ln(V)* = log(market value of equity at year-end), *ln(Age)* = log(2003 - year of foundation), *Grow* = average growth in sales over 3 years, *Lev* = total debt/book value of equity, *Conc* = closely held shares/total shares outstanding, *CapInt* = fixed assets/total assets, *1_{Y<0}* = 1 if the company has negative net income, = 0 otherwise, *1_{Acc}* = 1 if the company uses IFRS or US GAAP, = 0 otherwise, *Protctn* = anti-self dealing index developed by Djankov et al. (2008), *#Lst* = number of stock exchanges the company is listed on, *%Intan* = intangible assets/total assets, *ln(GDP)* = ln(GDP per capita), *MCap* = total market capitalization/GDP. ***, **, *, + indicate significantly different at the .1 per cent, 1 per cent, 5 per cent, and 10 per cent level, respectively (two-tailed tests).

and country corporate-governance scores), the shareholder-protection index, and other control variables, the inverse Mills ratio calculated from Equation 1, and time- and industry-fixed effects. The results indicate that the instruments are effective. Firstly, the \bar{R}^2 of the regression is 84 per cent and the partial \bar{R}^2 of the instruments is high, about 67 per cent. Secondly, both lagged corporate-governance ratings (*t* = 4.80) and corporate-governance recommendations (*t* = 2.05) are significantly related with current ratings. Thirdly, the *F*-statistic of the regression (418.24) is highly significant and exceeds the critical value of 21.38 (see Stock & Yogo, 2004). Next, the results show that companies in countries with more extensive corporate-governance recommendations (*t* = 2.05) or stronger shareholder-protection laws (*t* = 1.82) have higher corporate-governance ratings; thus, in terms of adoption by companies, country- and firm-level governance seem to complement one another. Finally, the table suggests that corporate-governance ratings improve over time, as the time indicator variables are significant and their coefficients increase.

Table 7 provides the results from Equation 3. The Hausman test confirms that an endogeneity problem arises for all performance measures (*t* > 1.69). The Hansen-Sargan test shows that the instruments we proposed to control for the endogeneity problem are valid; the null hypothesis of valid instruments cannot be rejected. A third finding is that sample-selection bias is a valid concern; the inverse Mills ratio is significant in each regression (*t* > 1.88). But more importantly, after dealing with both biases, corporate-governance ratings have a significant positive impact on both market and accounting performance measures (*t* > 2.32).

The results, furthermore, indicate that in countries with a high shareholder-protection index, both firm value and accounting performance are higher (*t* > 2.06). The interaction between the shareholder-protection index and corporate-governance ratings is significantly negative in all regressions (*t* < -1.79). This indicates that higher corporate-governance ratings have a stronger positive impact on market and accounting performance in countries where minority shareholders are less protected from insiders' self-dealing. Thus, in terms of effectiveness (as distinct from the degree of adoption by companies), country- and firm-level governance are substitutes. With regard to the firm-level control variables, our findings are consistent with prior studies. The results regarding the time effects show that, compared to 2000, corporate-governance ratings have a weaker impact on all performance measures in 2002 and 2003. One explanation could be that companies, prodded by the fact that countries have introduced new codes or extended and improved old ones and by increased shareholder scrutiny following the accounting scandals, have improved their corporate-governance practices, leading to corporate-governance levels in 2003 closer to the level demanded by outside shareholders.

A comparison of the corporate-governance coefficients in the three-stage model with those in the benchmark OLS regressions (see Table 5) shows that, after controlling for selection bias and endogeneity, the coefficients have become significant for all performance regressions. For *RoA* and *RoE*, the coefficient even changes from negative to positive.

TABLE 7
Main Test Equation, Corrected for Selection and Endogeneity Bias

	Q		MtS		MtB		RoA		RoE	
	coef	t-stat	coef	t-stat	coef	t-stat	coef	t-stat	coef	t-stat
Cons	-2.84 ⁺	-1.64	-3.78	-1.54	-5.28	-1.11	-.21	-1.11	-.14	-.62
\widehat{Gov}_j	.09**	2.92	.09**	2.85	.25*	2.32	.01**	2.75	.03**	2.68
<i>Protctn</i>	3.73*	2.48	2.62*	2.38	2.09*	2.51	.25*	2.06	.49*	2.49
$\widehat{Gov}_j \times Protctn$	-.11 ⁺	-1.88	-.29*	-2.09	-.24*	-2.19	-.08 ⁺	-1.79	-.02*	-2.23
$Ln(V)$	.37*	2.24	.62**	2.86	.65 ⁺	1.99	.01 ⁺	1.87	.06 ⁺	1.96
$Ln(Age)$	-.25 ⁺	-1.74	-.57*	-2.10	-.07 ⁺	-1.72	-.01 ⁺	-1.73	-.04*	-2.06
<i>Grow</i>	.84 ⁺	1.76	1.20 ⁺	1.76	1.49	.71	.07 ⁺	1.74	.02 ⁺	1.93
<i>Lev</i>	-.07**	-2.74	-.14***	-3.58	-.08	-.52	-.00***	-3.65	-.01**	-2.72
<i>Conc</i>	.08	.48	-1.07	-.80	-1.60	-1.12	-.01	-.94	-.02	-.55
<i>CapInt</i>	-1.06*	-2.19	-2.37*	-2.15	-2.18*	-2.58	.08**	2.76	-.00	-.84
$1_{y<0}$	-.42*	-2.22	-.06 ⁺	-1.72	-.75 ⁺	-1.84	-.13*	-2.26	-.452*	-2.56
1_{Acc}	-.08	-.48	-.23	-1.17	-.41	-.53	-.00	-.42	-.03	-.98
<i>IMR</i>	.51*	2.17	.98*	2.17	1.03*	2.06	.02 ⁺	1.88	.09*	2.23
1_1	.30	.73	.46	.96	.75	.50	.19	.83	.19	.78
1_2	.07	.15	.32	1.53	.71	.88	.15	.10	.17	1.18
1_3	.42	.86	.41 ⁺	1.85	.97	.53	.60	.37	.17	1.24
$1_1 \times Gov$	.01	.47	-.09	-1.07	.00	-.03	-.13 ⁺	-1.64	-.14	.49
$1_2 \times Gov$	-.01 ⁺	-1.72	-.20 ⁺	-1.69	-.04 ⁺	-1.74	-.23*	-2.29	-.25 ⁺	1.79
$1_3 \times Gov$	-.02 ⁺	-1.95	-.24 ⁺	-1.84	-.05*	-2.06	-.23*	-2.31	-.42*	2.27
R ²	.21		.28		.18		.25		.35	
Hausman (1978) specification test	1.76 ⁺		1.69 ⁺		1.74 ⁺		1.86 ⁺		1.73 ⁺	
Hansen-Sargan overidentified restrictions test	2.52		1.37		.72		.92		1.34	
	(.23)		(.19)		(.42)		(.22)		(.25)	

This table presents results from regressions of five alternative performance measures on the predicted corporate-governance rating from Equation 2 (\widehat{Gov}_j), the shareholder-protection index, an interaction between these two variables, the inverse Mills ratio, and control variables. The regressions are estimated using the pooled sample of FRSEurofirst 300 companies (938 observations, see Table 2 panel A) with year and industry fixed effects (for the sake of brevity, industry effects are not reported). Standard errors are heteroskedasticity robust, clustered at the firm level (Rogers, 1993; Petersen, 2005). Variable definitions: *Gov* = predicted corporate-governance ratings estimated from Equation (2) (see Table 6 Panel B for full regression model and results), *IMR* = inverse Mills ratio calculated from Equation 1 (see Table 6 Panel A for full regression model and results). *Q* = (total assets + market value of equity at year-end – book value of equity)/total assets, *MtS* = market value of equity at year-end/total sales, *MtB* = market value of equity at year-end/book value of equity, *RoA* = (net income + interest expenses)/total assets, *RoE* = net income/book value of equity, $ln(V)$ = log(market value of equity at year-end), $ln(Age)$ = log(2003 – year of foundation), *Grow* = average growth in sales over 3 years, *Lev* = total debt/book value of equity, *Conc* = closely held shares/total shares outstanding, *CapInt* = fixed assets/total assets, $1_{y<0}$ = 1 if the company has negative net income, = 0 otherwise, 1_{Acc} = 1 if the company uses IFRS or US GAAP, = 0 otherwise, *Protctn* = anti-self dealing index developed by Djankov et al. (2008), 1_t = time dummy for years {1, 2, 3} versus the starting year. ***, **, *, + indicate significantly different at the .1 per cent, 1 per cent, 5 per cent, and 10 per cent level, respectively (two-tailed tests). The Hausman (1978) specification test reports t-statistics of the Durbin-Wu-Hausman test. The null hypothesis is no endogeneity problem. The Hansen-Sargan overidentified restrictions test tests whether the instruments used are valid (H0). Chi-square test statistics (*P*-values) are reported.

This supports our assumption that failure to control for sample-selection bias and endogeneity results in an underestimated coefficient for corporate-governance ratings.

Finally, we calculate for each variable the effect of a one-standard-deviation change and the degree of variance explained in order to determine the economic significance of the variables (see Table 8). The table clearly shows that a one-sigma change in corporate-governance ratings has a significant impact on all performance variables. The only other variable with a significant economic impact is shareholder

protection: *Gov*'s average impact across the five measures is .64, against .53 for *Protctn* and less than .40 for all other variables. For two out of the five performance measures the one-sigma change in corporate-governance ratings is the most influential. With regard to the variance explained, the average impact of *Gov* is even twice that of *Protctn* (.13 against .06, with all other control variables below .03). Across the five performance measures, four times *Gov* has the largest impact; even for ROE *Gov* is a close second (.18, against .20 for *Protctn*). In short, besides being statistically

TABLE 8
Economic Significance

	Effect of one sigma-change						Variance explained					
	Q	MtS	MtB	RoA	RoE	Avg	Q	MtS	MtB	RoA	RoE	Avg
\widehat{Gov}_j	.57	.75	1.59	.06	.19	.63	.08	.16	.08	.13	.18	.13
<i>Protctn</i>	1.08	.76	.61	.07	.14	.53	.03	.03	.01	.04	.20	.06
<i>Ln(V)</i>	.42	.71	.74	.01	.07	.39	.04	.03	.02	.00	.05	.03
<i>Ln(Age)</i>	-.30	-.68	-.08	-.01	-.05	-.22	.02	.02	.00	.00	.02	.01
<i>Grow</i>	.19	.28	.34	.02	.01	.17	.01	.00	.00	.00	.00	.00
<i>Lev</i>	-.31	-.62	-.36	.00	-.05	-.27	.02	.02	.00	.00	.02	.01
<i>Conc</i>	.02	-.25	-.37	.00	-.01	-.12	.00	.00	.00	.00	.00	.00
<i>CapInt</i>	-.25	-.57	-.52	.02	.00	-.27	.02	.02	.01	.00	.00	.01
$1_{Y<0}$	-.11	-.02	-.20	-.04	-.12	-.10	.00	.00	.00	.01	.15	.03
1_{Acc}	-.02	-.06	-.11	.00	-.01	-.04	.00	.00	.00	.00	.00	.00

This table presents for each of the performance measures the effect of a one standard-deviation change and the degree of variance explained for each of the main variables. Variable definitions: Q = (total assets + market value of equity at year-end – book value of equity)/total assets, MtS = market value of equity at year-end/total sales, MtB = market value of equity at year-end/book value of equity, RoA = (net income + interest expenses)/total assets, RoE = net income/book value of equity, \widehat{Gov}_j = predicted corporate-governance ratings estimated based on Equation (2) (see Table 6 Panel B for full regression model and results), $Protctn$ = anti-self dealing index developed by Djankov et al. (2008), $ln(V)$ = log(market value of equity at year-end), $ln(Age)$ = log(2003 – year of foundation), $Grow$ = average growth in sales over 3 years, Lev = total debt/book value of equity, $Conc$ = closely held shares/total shares outstanding, $CapInt$ = fixed assets/total assets, $1_{Y<0}$ = 1 if the company has negative net income, = 0 otherwise, 1_{Acc} = 1 if the company uses IFRS or US GAAP, = 0 otherwise.

TABLE 9
Step by Step Approach

	(1) Simple OLS	(2) Selection (Heckman)	(3) Endogeneity (2SLS)	(4) Full 3-stage model
Q	.02 (1.18)	.03 (1.65) ⁺	.04 (1.77) ⁺	.09 (2.92)**
MtS	.03 (1.46)	.05 (2.25)*	.07 (2.12)*	.09 (2.85)**
MtB	.02 (1.12)	.08 (1.89) ⁺	.10 (1.79) ⁺	.25 (2.32)*
RoA	-.003 (-1.17)	.000 (.15)	.001 (.72)	.013 (2.75)**
RoE	-.001 (-.33)	.002 (.23)	.001 (.93)	.032 (2.68)**

This table presents the coefficient and t-statistic (between brackets) of corporate-governance ratings for each performance measure using different estimation methods. The first column presents the results from OLS regressions (see Table 5). The second column shows the results after controlling for sample-selection bias. This is done with the help of the Heckman (1979) procedure. In the third column, we control for the endogeneity problem using 2SLS. The fourth column presents the results of the three-stage model in which we control simultaneously for sample-selection bias and endogeneity (see Table 7). ***, **, *, + indicate significantly different at the .1 per cent, 1 per cent, 5 per cent, and 10 per cent level, respectively (two-tailed tests).

significant, corporate-governance ratings are also economically significant and their effect outweighs the effect of the control variables.

Table 9 provides information about which of the two statistical problems, sample selection or endogeneity, has the largest impact on the bias in the coefficient of corporate-governance ratings. For the sake of brevity, only the coefficients and t-statistics (between brackets) of the corporate-governance ratings are provided. The first column shows the results from the OLS regressions (see Table 5). The second

column reports the results after controlling only for sample-selection bias using the Heckman (1976, 1979) procedure, and the third column shows the results after controlling only for endogeneity through 2SLS. Finally, the fourth column shows the results from the three-stage model (see Table 7).

From Table 9 the following conclusions can be drawn. First, the coefficients of corporate-governance ratings are higher (and become significant for the market performance measures) after controlling for either selection bias or endogeneity, than after OLS estimation. As far as the accounting

measures are concerned, the coefficients change from negative to positive, but they remain insignificant. Second, Table 9 shows that simultaneously controlling for both sample-selection bias and endogeneity leads to the highest increase in the coefficients of corporate-governance ratings. Third, Table 9 suggests that sample-selection bias and endogeneity equally contribute to the bias in the coefficients, as the change in the coefficients is of about the same size when controlling for either selection bias or endogeneity. In other words, ignoring the impact of either selection bias or endogeneity results in coefficients that are still severely underestimated. Finally, compared with 2SLS estimation, as used by some prior studies (Bhagat & Bolton, 2007; Black et al., 2006; Drobetz et al., 2004; Durnev & Kim, 2005), the coefficients of corporate-governance ratings in the three-stage model increases at least by half. This once again indicates that controlling for sample-selection bias is as important as controlling for endogeneity.

As a final test, we examine the distribution of the sample-selection bias. Regarding the market measures, using a sample of between 50 and 60 per cent of the total population results in a coefficient for corporate-governance ratings becoming insignificant. However, regarding the accounting measures, the selection bias already becomes apparent when the sample consists of about 80 per cent of the total population, resulting in an insignificant coefficient for corporate-governance ratings. This illustrates that studies have to take sample-selection bias into account when making use of selected samples

ROBUSTNESS TESTS

Following Larcker and Rusticus (2008), we investigate whether our results are sensitive to the instruments used. First, we use either the country scores or lagged corporate-governance ratings as the sole instrument. We find that under both specifications our conclusions hold. The coefficients of the corporate-governance ratings, however, decrease when we use only one of the two instruments. This indicates that the efficiency of one instrument is lower than the efficiency of a set that combines both instruments. This confirms the rule that the R^2 in the instrumenting regression is crucial for the quality of the second-stage regression.

In a second robustness check we estimate the regressions with, as the instruments, corporate-governance ratings lagged two periods and the country scores. Ratings lagged two periods may be more exogenous than ratings lagged only one period. Our findings are not affected.

CONCLUSION

Earlier studies often fail to establish a relationship between corporate-governance ratings and corporate performance, despite strong prior assumptions widely held in academia. Based on agency theory (Jensen & Meckling, 1976), we expect to find a positive relationship between corporate-governance ratings and company performance. To the extent that higher corporate-governance ratings proxy for better

actual corporate-governance practices, higher corporate-governance ratings should translate into improved operating performance and a higher market value, as better monitoring forces insiders to invest in projects with a positive net present value and to reduce perks and waste, so that more of the benefits flow back to outside investors (Shleifer & Vishny, 1997). For those believers, then, our study brings good news – in our cross-European panel, higher corporate-governance ratings are clearly associated with better performance, whether market- or accounts-based.

Our success in finding such an association probably is a matter of statistical power: we rely on a panel rather than a cross section, and in our cross-European sample there is more variation in the key regressor, governance ratings, than in a one-country study. In addition, the regression equation itself tries to pick up variation across firms and over time in the relationship. But a lot is probably also due to our attention to the impact of endogeneity and sample-selection bias on the relationship between firm performance and corporate-governance ratings. We focus on a European setting, because the institutional characteristics imply a wide range of corporate-governance ratings and, thus, more power than a typical US sample. In addition, the European focus allows us to investigate how differences in the institutional environment explain the level and the effect of corporate-governance ratings on firm performance and to use a country-level instrument to control for endogeneity. Finally, because we have corporate-governance ratings over time, we are able to study the evolution of corporate-governance ratings and their effect on performance over time in a voluntary setting. Below, we review our key findings.

The results show that controlling for both sample-selection bias and endogeneity simultaneously is necessary – the coefficient of corporate-governance ratings has a highly significant positive impact on performance after controlling for both problems, whereas it has an insignificant and, in some regressions, even a negative impact on performance if we do not control for these problems. The results are not only statistically significant but also economically. These results imply that corporate-governance ratings are relevant and that in adhering to good corporate-governance practices, companies can significantly improve their performance.

Second, our results show that in countries with strong shareholder-protection laws and regulations, companies have higher corporate-governance ratings; but in those countries the effect of governance on company performance is smaller than in countries with only weak shareholder-protection regulations. The diminishing-returns phenomenon is consistent with country- and company-level measures being substitutes to some extent. But this phenomenon is also consistent with the idea that insiders take into account the amount of private benefits they can expropriate when deciding on the level of corporate-governance practices. In countries with high standards, private benefits are low and good corporate governance is an inexpensive signal for companies. This results in a smaller performance improvement for these companies as they will be closer to the zero-marginal-benefit situation we would expect when performance is optimized. In contrast, in countries with

weak institutions, improving corporate governance is an expensive signal as it reduces the amount of private benefits. As a consequence, corporate-governance ratings will be further from the optimal level, the marginal benefits will be far from being exhausted, and any improvement in corporate-governance ratings should lead to better performance.

Next, our findings suggest that, although corporate governance is largely voluntary in Europe, corporate-governance ratings seem to increase over time, resulting in a level that is closer to what outside investors demand. This is relevant in the debate on whether corporate governance should be regulated by laws or can be left to the "invisible hand" of the market (Chhaochharia & Laeven, 2008; De Jong et al., 2005; MacNeil & Li, 2006). These findings also contribute to the recent literature on the compliance with and the effectiveness of codes of good governance (Aguilera & Cuervo-Cazurra, 2009).⁸

Finally, we have performed some additional tests with regard to the magnitude of the bias. We find that selection bias and endogeneity seem to have a comparable influence on the coefficient of corporate-governance ratings, at least in this sample; and controlling for both problems simultaneously leads to a substantial increase in the coefficient. In other words, controlling for just one of these problems reduces the bias only partially.

One limitation of this study is that it does not take into account the interactions between corporate-governance ratings and other governance mechanisms, such as the company's ownership and debt structure. Prior research (e.g., Agrawal & Knoeber, 1996; Cho & Kim, 2007) suggests that these mechanisms are interrelated and that firms choose an optimal combination. We partially controlled for this interdependence, however, by including control variables related with both ownership structure and leverage. A second limitation is that we use corporate-governance ratings as a proxy for corporate-governance practices. Although it seems reasonable to expect that rating agencies, such as Deminor Rating, rate the actual practices of companies, future research might examine the extent to which ratings and practices are related with each other. But the fact that we do find a positive relationship as suggested by theory, despite an undeniable errors-in-variables handicap, is consistent with the idea that the ratings pick up something meaningful.

With regard to the generalizability of our results to other institutional settings, we believe that our findings can be generalized to developing countries. Prior literature has already found evidence of a positive relationship in these countries, and we expect that after controlling for selection bias and endogeneity, the results will be even stronger. However, we believe that it is more problematic to generalize our results to the US. Due to the relatively low variation in corporate-governance ratings between US companies, especially since the introduction of the Sarbanes-Oxley Act, we believe that it would be difficult to find evidence of a positive relationship even after controlling for selection bias and endogeneity in a US setting.

The results of this study provide evidence of the importance of methodological issues in an accounting and finance context. The model adopted in this study could be used in other settings where insiders can make decisions that do not

maximize shareholder value, such as the degree of disclosure, the extent of anti-takeover mechanisms, or individual corporate-governance mechanisms. Our paper also contributes to the literature by showing that improved corporate-governance ratings lead to better performance, but that econometric problems might obscure this relationship. Next, we show that for a sample of developed countries the institutional environment affects the relationship between governance ratings and performance. Our results are relevant for both companies and policy makers. They indicate that companies can improve performance by adhering to good corporate-governance standards. For policy makers, the findings suggest that soft laws and the invisible hand of the market lead to at least some companies improving their corporate governance.

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NOTES

1. Unlike credit ratings, corporate-governance ratings are unsolicited and do not involve any contractual relationship between the rating agency and the company. Hence, corporate-governance ratings can be perceived as reliable signals of the governance quality of companies. Dallas (2004) and Dallas and Patel (2004) argue that even though the complexity of the information makes it hard to produce a quantitative evaluation of firm-level governance, corporate-governance ratings are still valid indicators of good or bad governance.
2. See for instance: Black (2001), Gompers et al. (2001), Bauer et al. (2004), Drobetz et al. (2004), Klapper and Love (2004), Durnev and Kim (2005), Black et al. (2006), Bhagat and Bolton (2007), Larcker et al. (2007), Bhagat, Bolton, and Romano (2007), Daines et al. (2008).
3. See for instance: Bhagat et al. (2007), Daines et al. (2008).
4. Studies that do control for one of these biases include Borsch-Supan and Koke (2002), Drobetz et al. (2004), Durnev and Kim (2005), Black et al. (2006), and Bhagat and Bolton (2007). The studies that are most closely related to ours, by Klapper and Love (2004) and Durnev and Kim (2005), differ from ours with regard to country choice.
5. It is true, as a referee pointed out, that our procedure does not take into account a possible additional form of endogeneity – the sudden attention of public and policy makers for corporate-governance issues may have led to a belief among investors that it matters, self-fulfillingly resulting in higher stock prices. Fortunately, this mechanism would not affect accounting-based per-

- formance criteria like return on assets or equity, where we see the same improvement as in stock prices.
6. Corporate-governance ratings are often only available for the largest companies. For instance, Deminor ratings are available for the FTSEurofirst 300 companies (Bauer et al., 2004). Credit Lyonnais Securities Asia (CLSA) rates only 495 companies from 25 countries and selects the companies on the basis of firm size and investor interest (Durnev & Kim, 2005; Klapper & Love, 2004), and the SharkRepellent database comprises US companies that are included in the major indices (Larcker et al., 2007).
 7. Bhagat and Black (2002:237) note, "Board composition could affect firm performance, but firm performance can also cause the firm to change its board composition." Their results show that poorly performing companies increase the number of independent board members in an effort to improve performance.
 8. This voluntary improvement in corporate governance is comparable to the quality movement associated with the Environmental Management Standards (i.e., the ISO codes), which helped to raise the quality of products.

APPENDIX

Table A1

Criteria in the Country Index of Extensiveness of Corporate-Governance Recommendations

GENERAL PRINCIPLES

- | | | |
|-----|--------------------------------|--------|
| I. | Legal basis and compliance (1) | |
| | 1. Comply-or-explain principle | Yes/No |
| II. | Scope (1) | |
| | 2. Encouraged to all companies | Yes/No |
-

BOARD OF DIRECTORS

- | | | |
|------|--|------------------------------|
| III. | Mission of the board (5) | |
| | 3. Shareholder value maximization | Yes/No |
| | 4. Long-term viability of the company | Yes/No |
| | 5. Good relationship with stakeholders | Yes/No |
| | 6. Effective monitoring of management | Yes/No |
| | 7. Compliance with laws | Yes/No |
| IV. | Key functions of the board (6) | |
| | 8. Guide corporate strategy | Yes/No |
| | 9. Monitor and replace key executives | Yes/No |
| | 10. Review remuneration | Yes/No |
| | 11. Manage potential conflicts of interest | Yes/No |
| | 12. Guard integrity of financial reporting | Yes/No |
| | 13. Increase effectiveness of governance practices | Yes/No |
| V. | Independence of the board (3) | |
| | 14. Separation of chairman and CEO | Yes/No |
| | 15. Mix of inside and outside directors | |
| | – Non-executive directors | None/minimum number/majority |
| | – Independent directors | None/minimum number/majority |
| | 16. Stock options not allowed as compensation | Yes/No |
-

**Table A1
Continued**

BOARD COMMITTEES

VI. Recommended committees (3)	
17. Appointment committee	Yes/No
18. Remuneration committee	Yes/No
19. Audit committee	Yes/No
VII. Key functions of the committees (7)	
20. Appointment committee: propose appointment of directors	Yes/No
21. Remuneration committee: recommend remuneration for directors	Yes/No
22. Audit committee: report to the board	Yes/No
23. Audit committee: hear the company auditors	Yes/No
24. Audit committee: ensure appropriateness and consistency of accounting policies	Yes/No
25. Audit committee: verify accuracy of internal procedures	Yes/No
26. Audit committee: appoint auditor and determine audit fee	Yes/No
VIII. Independence of the committees (6)	
27. Appointment committee: non-executive directors	None/minimum number/majority
28. Appointment committee: independent directors	None/minimum number/majority
29. Remuneration committee: non-executive directors	None/minimum number/majority
30. Remuneration committee: independent directors	None/minimum number/majority
31. Audit committee: non-executive directors	None/minimum number/majority
32. Audit committee: independent directors	None/minimum number/majority

SHAREHOLDERS

IX. Shareholders' protection (4)	
33. Equal treatment of shareholders	Yes/No
34. One share/one vote	Yes/No
35. No anti-take-over devices	Yes/No
36. Proxy voting allowed	Yes/No
X. General meeting (4)	
37. Select new directors	Yes/No
38. Participate in decisions concerning fundamental changes	Yes/No
39. Decide on distribution of profits	Yes/No
40. Ask questions	Yes/No

DISCLOSURE

XI. Quality (2)	
41. Use high quality accounting standards	Yes/No
42. Audited by an independent auditor	Yes/No
XII. Timing (1)	
43. Timely disclosure of relevant information	Yes/No
XIII. Contents (7)	
44. Financial situation	Yes/No
45. Performance	Yes/No
46. Ownership	Yes/No
47. Governance	Yes/No
48. Relevant interests of directors	Yes/No
49. Composition of the board	Yes/No
50. Remuneration of key executives	Yes/No

TABLE A2
Descriptive Statistics (2): Regression Variables

	Mean	Median	Stdev
Performance variables			
Q	1.87	1.28	2.03
MtS	3.69	2.35	4.50
MtB	2.15	1.21	5.49
RoA	.06	.05	.11
RoE	.13	.13	.20
Governance variable			
Gov	21.94	20.90	6.37
Instruments			
Gov ₋₁	21.33	20.20	6.25
Code	29.79	30.25	8.77
Control variables			
Ln(V)	16.35	16.13	1.14
Ln(Age)	3.77	4.19	1.19
Grow	.12	.08	.23
Lev	2.64	.90	4.46
Conc	.21	.13	.23
CapInt	.26	.22	.24
1 _{Y<0}	.03	.00	.27
1 _{Acc}	.07	.00	.26
Protctn	.55	.42	.29
Exclusion restrictions			
#Lst	2.05	1.00	1.92
%Intan	.15	.07	.18
Ln(GDP)	10.02	10.04	.19
MCap	104.06	95.94	45.67

Descriptive statistics are given for all variables included in the three-stage model based on the FTSEurofirst sample (see Table 1 Panel A). Variable definitions: Q = (total assets + market value of equity at year end – book value of equity)/total assets, MtS = market value of equity at year end/total sales, MtB = market value of equity at year end/book value of equity, RoA = (net income + interest expenses)/total assets, RoE = net income/book value of equity, Gov = company corporate-governance ratings from Deminor Rating, Gov₋₁ = company corporate-governance ratings lagged one year, Code = country corporate-governance scores, ln(V) = log(market value of equity at year end), ln(Age) = log(2003 – year of foundation), Grow = average growth in sales over 3 years, Lev = total debt/book value of equity, Conc = closely held shares/total shares outstanding, CapInt = fixed assets/total assets, 1_{Y<0} = 1 if the company has negative net income, = 0 otherwise, 1_{Acc} = 1 if the company uses IFRS or US GAAP, = 0 otherwise, Protctn = shareholder-protection (anti-self dealing) index developed by Djankov et al. (2008), #Lst = number of stock exchanges the company is listed on, %Intan = intangible assets/total assets, lnGDP = ln(GDP per capita), MCap = total market capitalization/GDP.

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