An Integrated Framework of Corporate Governance and Firm Valuation - Evidence from Switzerland

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Stefan Beiner
University of Basel & Said Business School, University of Oxford

Wolfgang Drobetz
University of Basel

Markus M. Schmid
University of Basel

Heinz Zimmermann
University of Basel

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Abstract

Recent empirical work shows evidence of a positive relationship between firm-specific corporate governance and firm valuation. Instead of looking at a single control mechanism, we use a broad corporate governance index and additional variables related to ownership structure, board characteristics, and leverage to provide a comprehensive description of firm-level corporate governance for a broad sample of Swiss firms. We carefully control for the endogeneity of these control mechanisms by developing a system of simultaneous equations. Our results support the widespread hypothesis of a positive relationship between corporate governance and Tobin's Q.

Keywords: Corporate governance; Ownership structure; Firm valuation; Endogeneity

JEL Classifications: G12, G32, G34, G38

Stefan Beiner
Said Business School, University of Oxford
Park End Street
Oxford OX1 1HP, United Kingdom
e-mail: stefan.beiner@sbs.ox.ac.uk

Wolfgang Drobetz*
Department of Finance, University of Basel
Holbeinstrasse 12
4051 Basel, Switzerland
phone: +41-61-267 3239, fax: +41-61-267 0898
e-mail: wolfgang.drobetz@unibas.ch

Markus M. Schmid
Department of Finance, University of Basel
Holbeinstrasse 12
4051 Basel, Switzerland
phone: +41-61-267 3318
e-mail: markus-max.schmid@unibas.ch

Heinz Zimmermann
Department of Finance, University of Basel
Holbeinstrasse 12
4051 Basel, Switzerland
phone: +41-61-267 3316
e-mail: heinz.zimmermann@unibas.ch

* Corresponding Author

1. Introduction

This paper addresses the question whether "good" corporate governance has a positive impact on the valuation of listed companies in Switzerland. From a theoretical point of view, there are good reasons to assume that improved corporate governance practices increase firm value. Specifically, agency problems may affect the value of firms through two distinct channels: (i) the expected cash flows accruing to investors and (ii) the cost of capital. First, agency problems make investors pessimistic about future cash flows. Based on this simple idea, the model in La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2002) predicts that investors bid up stock prices, because "with better legal protection, more of the firm's profits would come back to them as interest or dividends as opposed to being expropriated by the entrepreneur who controls the firm."[1] Second, good corporate governance decreases the cost of capital, i.e., the expected rate of return, to the extent that it reduces shareholders' monitoring and auditing costs. This idea was formalized in a model by Lombardo and Pagano (2002). Specifically, they extend the Capital Asset Pricing Model (CAPM) to account for the expected agency costs caused by the conflict of interests between insiders and outside shareholders.

From an empirical point of view, there has been an ongoing debate in the literature how to measure the quality of firm-level corporate governance. Recently, many European countries have adopted new standards, rules, or codes of best practice to establish guidelines for publicly listed companies in an attempt to improve the overall level of corporate governance. In Switzerland, for example, the "Directive on Information Relating to Corporate Governance" and the "Swiss Code of Best Practice" have become effective as of July 1, 2002. Similarly,

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[1] See LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (2002), p. 1147. We also refer to the theoretical model in Shleifer and Wolfenzon (2002).

the “German Corporate Governance Code” has been put in place in early 2002 and contains recommendations and suggestions with respect to “good” corporate governance for the management and supervision of Swiss listed companies. This new set of rules, which is generally acknowledged to represent “responsible” corporate governance, enables the construction of a broad firm-specific corporate governance index and, hence, is an optimal staring point for empirical analysis. While there are numerous empirical studies on the link between governance practices and wealth effects for the U.S. stock market, the empirical evidence for European markets is still scarce (e.g., Drobetz, Schillhofer, and Zimmemann (2004) and Bauer, Guenster and Otten (2004)).

Switzerland is a particularly interesting case to analyze. The institutionalization of shareholdings, i.e., the accumulation of stocks by professional asset managers, has had a particularly strong effect on the structural changes of the equity market after pension plans became mandatory in the mid-eighties and emerged as the major domestic investment force. Moreover, in the course of the globalization of equity markets many restrictions protecting the management of Swiss firms were abandoned, such as restrictions on the transferability or ownership of shares (“Vinkulierung”) or multiple share classes with limited or unequal voting rights (see Kunz (2002)). Finally, although the market for corporate control has developed only slowly during the nineties (see Loderer and Zgraggen (1999) for a remarkable takeover battle), there have been observable attempts by many firms to adopt internationally recognized governance principles in recent years. These developments and structural changes were indeed revolutionary for the relatively closed and strongly regulated Swiss stock market and, hence, make it interesting to investigate the role of specific control mechanisms in more detail.

In order to analyze the hypothesized relationship between the quality of a firm's governance practices and firm valuation, we construct a firm-specific Corporate Governance Index (*CGI*) based on a broad survey among all listed companies on the Swiss Stock Exchange (SWX), excluding investment companies. This approach has become popular in the literature only recently. For example, Black, Jang, and Kim (2003), Klapper and Love (2003), and Drobetz, Schillhofer, and Zimmermann (2004) construct a survey-based governance index and report that better firm-level corporate governance is associated with higher firm valuation. The index we use in this paper is based on the recommendations and suggestions of the Swiss Code of Best Practice. It serves as a broad measure of firm-specific corporate governance quality and reflects 38 different governance attributes, which are not (yet) legally required but considered as "good" corporate governance practice by international standards. To provide an integrated framework, we also investigate other crucial control mechanisms that are not contained in the index, namely stock ownership by officers and directors, outside blockholdings, leverage, board size, and the fraction of outside directors on the board.

A problem which plagues virtually all empirical studies in corporate governance is endogeneity. The question is whether good corporate governance *causes* higher firm valuations. Alternatively, firms with higher market values could simply be more likely to choose better governance structures. In this case it is impossible to make an assessment of the causal connection. In our empirical analysis we are therefore careful to control for possible interrelationships between the different governance mechanisms and Tobin's Q. One may also suspect important substitution effects. Given a broad menu of interrelated control mechanisms a firm can choose from, greater use of one mechanism needs not be positively related to firm valuation. Specifically, where one mechanism is used less, others may be used more, resulting in the same valuation effects. The existence of alternative control mechanisms and their possible

interdependences make regressions relating the use of any single mechanism to firm valuation difficult to interpret. To avoid spurious regression results, we follow Agrawal and Knoeber (1996) and develop a comprehensive system of simultaneous equations and apply three stage least squares (3SLS).

Our results clearly support the widespread hypothesis of a positive relationship between corporate governance and firm value. Most importantly, an increase in the corporate governance index by one point (where the index ranges from 1 to 100) *causes* an increase of the market capitalization by roughly 8.5%, on average, of a company's book asset value. We also report a number of other interesting results concerning the relationship between Tobin's Q and the different control mechanisms. For example, firm valuation significantly increases with higher shareholdings of officers and directors. In addition, higher shareholdings of officers and directors are associated with a lower fraction of outsiders on the board, which indicates possible substitution effects.

The remainder of the paper is organized as follows. Section 2 gives a motivation for the use of each control mechanism employed in this paper and reviews some earlier empirical evidence. Section 3 presents the methodological approach. Section 4 defines the variables and describes the data. The empirical results are presented in Section 5. Section 6 discusses various robustness checks on our results. Finally, section 7 concludes.

2. Control mechanisms and firm value: A brief literature review

In the theoretical literature different control mechanisms have been suggested to alleviate the agency problems between managers and shareholders. Accompanying this classical strand of the corporate finance literature, an extensive empirical literature has developed with the avail-

ability of appropriate firm-level data only recently. The relationship between corporate governance and firm valuation has attracted particular attention. Virtually all previous studies concentrated on specific aspects of governance, such as takeover defenses (Gompers, Ishii, and Metrick (2003)), executive compensation (Loderer and Martin (1997)), blockholdings (Demsetz and Lehn (1985)), board size (Yermack (1996) and Eisenberg, Sundgren, and Wells (1998)) or board composition (Hermalin and Weisbach (1991) and Bhagat and Black (2002)).[2] Nevertheless, it seems crucial to account for the fact that all these control mechanisms – while valuable per se – can be adopted alternatively and possibly substituted for each other to some extent. Therefore, in our empirical analysis, we use an extensive set of governance variables simultaneously. As a first variable we construct a broad corporate governance index, which is mainly based on the Swiss Code of Best Practice (e.g., see Black, Jang, and Kim (2003) and Drobetz, Schillhofer, and Zimmermann (2004) for comparable indices). To give a comprehensive picture of firm-level corporate governance, our study includes five additional (unrelated) control mechanisms: share ownership by officers and directors, shareholdings by large outside blockholders, board size, leverage, and outside representation on the board. In this section we provide a short motivation for the use of these control mechanisms and review the empirical evidence.

2.1 Corporate Governance Index (CGI)

There is substantial evidence in the law and finance literature that variations in country-level legislative rules affect the market valuation of individual firms. Supporting the notion that increased shareholder activism, tightened rules and regulation, and additional self-regulation deliver higher shareholder value, La Porta, Lopes-de-Silanes, Shleifer, and Vishny (2002)

[2] See Shleifer and Vishny (1997) for a survey.

find for a sample of 539 firms of 27 wealthy economies that better protection of minority shareholders is associated with a higher valuation. However, there is less evidence on the effect of firm-specific variation in corporate governance practices *within* a single jurisdiction on company valuation. For example, Black (2001) examines the relationship between corporate governance and valuation for a sample of 21 Russian firms. He constructs a firm-specific corporate governance ranking and shows that a one standard deviation change in the governance ranking predicts a seven-fold increase in firm value.[3] Using a much broader sample of 859 firms in 27 countries, Durnev and Kim (2002) find that companies with better corporate governance and better disclosure standards have, on average, higher Tobin's Qs and investments. They report that a 10 point increase (out of 100) in the Credit Lyonnais Securities Asia (CLSA) corporate governance index increases a firm's market value by 13.3%, while a 10 point increase (out of 98) in the S&P disclosure and transparency index increases a firm's market value by 16.3%. Klapper and Love (2003) support these findings for the CLSA index, using a sample of 374 large firms in 145 emerging markets. Similarly, Gompers, Ishii, and Metrick (2003) construct a governance index based on takeover defenses for a sample of about 1500 US firms. They report that firms with better corporate governance receive higher market valuations and have higher profits, higher sales growth, and lower capital expenditures. In a similar vein, Drobetz, Schillhofer, and Zimmermann (2004) document a positive relationship between governance practices and firm valuation for German public firms by constructing a broad corporate governance rating related to the German Corporate Governance Code. They report that for the median firm a one standard deviation change in the governance rating results in a 24% increase in the value of Tobin's Q. However, most of these studies do not directly address the possible endogeneity of corporate governance mechanisms,

[3] However, these results should be interpreted with due care. First, the sample size is very small. Second, Black (2001) does not control for endogeneity.

i.e., most of the results just described can only be interpreted as partial correlations without clear indication of causality.

An exception is Black, Jang, and Kim (2003), who find a positive relation between their corporate governance index and Tobin's Q for a sample of 526 Korean public companies. Their index is primarily based on responses to an extensive survey among Korean listed companies and consists of six subindices for shareholder rights, board of directors in general, outside directors, audit committee and internal auditor, disclosure to investors, and ownership parity. To control for a possible endogeneity, they use a three stage least square (3SLS) simultaneous equations approach and show that a 10 point increase (out of 100) in the governance index *causes* a 19.4% increase in Tobin's Q.

2.2 Officers' and directors' financial commitment to their firm

An important method of ensuring that managers pursue the interests of shareholders is to structure compensation appropriately. Diamond and Verrechia (1982) and Holmstrom and Tirole (1993) developed models that are based on the interaction of capital markets and contingent compensation, and giving managers an equity stake in the firm is the simplest form to achieve this. Another important control mechanism, which is supposed to align the interests of managers and shareholders is the monitoring capacity of the board of directors. But who monitors the monitors? To alleviate this problem, stock participation plans have been extended to directors of the board to ensure that they monitor and discipline managers, thereby better protecting the interests of shareholders.

In spite of the pervasive theoretical claims, the empirical evidence on the relation between insider stockholdings and firm performance is mixed and somewhat contradictory. For example, Morck, Shleifer, and Vishny (1988) find a nonlinear relationship between the fraction of

stock held by the members of the board of directors and Tobin's Q, and a less significant relationship when firm performance is measured by the accounting rate of return. At least when the fraction of shares held by the board is small, as is the case for most firms in their sample, greater board shareholding improves performance. McConnell and Servaes (1990) find a similar nonlinear relation between insider shareholdings and firm valuation. Mehran (1995) also finds that firm performance, as measured by Tobin's Q or the return on assets, is positively related to both the percentage of executive compensation which is stock-based and the percentage of equity held by the management.

The more recent literature employs simultaneous systems of equations to control for a possible endogeneity of managerial share allocation and ownership. For example, Chung and Pruitt (1996) find a positive influence of CEO equity ownership on Tobin's Q. In contrast, also applying a simultaneous equations framework, Loderer and Martin (1997) find no evidence that larger managerial stockholdings lead to a better firm performance. However, firm performance seems to affect how much stock executives want to hold in their firm. Himmelberg, Hubbard, and Palia (1999) control for the endogeneity of ownership by using panel data and find little evidence that changes in managerial ownership affect performance. Finally, Schmid (2003) uses a simultaneous equations system and finds a positive effect of the percentage share ownership of officers and directors on firm valuation for a sample of 145 Swiss firms. At the same time his results suggest that Swiss managers are more likely to hold equity when they are confident that their company will do well and, hence, it is attractive for them to participate.

2.3 Blockholdings

Stiglitz (1985) argued that one of the most important ways to ensure that managers pursue value maximizing strategies is through concentrated ownership. With dispersed ownership, no single shareholder has an incentive to monitor the management. In contrast, an ownership structure where one or more shareholders own large blocks of stock should enable closer monitoring of management behavior. Shleifer and Vishny (1986) present a model in which a blockholder effectively monitors management by virtue of representing a credible takeover threat. Admati, Pfleiderer, and Zechner (1994) develop a model where equity-financed firms have one large shareholder and show that more wealth commitment by owners increases monitoring and firm performance.

Denis, Denis, and Sarin (1997) show empirically that top executive turnover is more sensitive to poor performance in firms with outside blockholders than in firms without outside blockholders. They interpret this finding as evidence for a monitoring function of managers by outside blockholders. However, the overall empirical evidence on the effects of block ownership on firm value is mixed. Mikkelson and Ruback (1985) document positive abnormal returns following the announcement of the acquisition of a 5% or greater stake in one firm by another firm. Similarly, McConnell and Servaes (1990) find a positive relation between institutional ownership and Tobin's Q. In contrast, Demsetz and Lehn (1985) find no cross-sectional relationship between the concentration of shareholdings and accounting rates of return. Agrawal and Knoeber (1996) also find no evidence for a positive influence of outside blockholdings on firm performance. Their results are robust; they use a standard OLS procedure and also estimate a simultaneous system of equations to control for possible endogeneity. Using a similar simultaneous equations approach, Schmid (2003) finds no statistically significant effect of

outside blockholdings on firm valuation for his sample of Swiss firms. Interestingly, Beiner, Drobetz, Schmid, and Zimmermann (2003) even find a significantly negative relation between blockholdings and firm performance for their sample of Swiss firms.

2.4 Board size

The board of directors is another important control mechanism. Its role is to monitor and discipline a firm's management, thereby ensuring that managers pursue the interests of shareholders. Lipton and Lorsch (1992) and Jensen (1993) were the first to hypothesize that board size is an independent control mechanism. Specifically, they argue that large boards may be less effective than small boards. The underlying notion is that large boards can make coordination, communication, and decision making more cumbersome than it is in smaller groups. Jensen (1993) suggests an optimal board size of seven or eight directors.

Yermack (1996) was the first to investigate this proposition empirically. In fact, using a sample of large U.S. public corporations, he reports an inverse relationship between board size and firm value, as measured by Tobin's Q. Controlling for possible endogeneity, he finds that causality is running from board size to Tobin's Q. There is no evidence that firms change board size as a reaction to past performance. Although he does not account for a possible endogeneity of board size, Huther (1997) confirms these findings for a sample of U.S. electricity companies. Eisenberg, Sundgren, and Wells (1998) also find a negative size effect for a sample of small Finnish firms. Most recently, using a simultaneous equations approach for a sample of Swiss companies, Beiner, Drobetz, Schmid, and Zimmermann (2003) cannot detect a significant relationship between board size and firm value. They interpret this finding as evidence that Swiss firms, on average, choose the number of board members just optimally. In

fact, average board size in their sample is 6.6, which is close to the optimal board size put forth by Lipton and Lorsch (1992) and Jensen (1993).

2.5 Outside representation on the board

Probably the most widely discussed question regarding boards of directors is whether having more outside directors increases corporate performance. Hermalin and Weisbach (1998) offer a theoretical model with a variety of predictions with respect to board independence. For example, their model predicts that CEO turnover is more sensitive to performance when the board is more independent and that the probability of independent directors being added to the board rises following poor firm performance. More generally, the board of directors is responsible for evaluating the senior management of a corporation and to replace it if it does not pursue shareholders' interests. Because inside directors' careers are tied to the CEO's, they are generally unable or unwilling to remove incumbent CEOs and, hence, this task is likely to fall on outside directors. Moreover, outside directors are often respected leaders from the business or academic community, whose reputations suffer when they are associated with failing companies. It is therefore widely believed that this creates an incentive to prevent severe governance malfunctions.[4]

Consistent with this proposition, Rosenstein and Wyatt (1990) provide evidence that the proportion of outside directors positively affects shareholder wealth. In fact, they document a positive stock price reaction upon announcement of the appointment of an additional outside director. Additionally, the findings of Weisbach (1988) suggest that firms with outsider-dominated boards are significantly more likely to remove the CEO on the basis of bad per-

[4] Hermalin and Weisbach (2003) provide a thorough survey about the theoretical and empirical research on boards of directors.

formance than firms with insider-dominated boards. In a related study, Hermalin and Weisbach (1988) find that outsiders are more likely to join a board after a firm performs poorly or leaves an industry. In contrast, Yermack (1996) finds no association between the percentage of outside directors and firm performance. Ignoring any interdependences among the different mechanisms, Agrawal and Knoeber (1996) find that the representation of outsiders on the board of directors, debt policy, and corporate control activity are related to Tobin's Q. When they account for the interdependences between these mechanisms in a simultaneous equations system, the percentage of outside board representation is the only control mechanism that remains significantly related to firm performance. These findings are again consistent with the proposition that all control mechanisms are just chosen optimally, except board composition. In contrast, Beiner, Drobetz, Schmid, and Zimmermann (2003) find no relationship between the fraction of outside board members and Tobin's Q for their sample of Swiss firms.

2.6 Leverage

Jensen (1986, 1993), Stulz (1990), and Hart and Moore (1995), among others, suggest that debt helps to discourage overinvestment of free cash flow by self-serving managers. Debt can also create value by giving the management the opportunity to signal its willingness to distribute cash flows and to be monitored by lenders. Accordingly, we also include leverage as an additional control mechanism. However, it must be noted that the argument that debt can ensure good corporate governance is significantly weakened by the fact that retained earnings are the most important source of finance for corporations. Typically, as stressed by Hellwig (1998), large firms do not have a problem in meeting their debt payments.

Empirically, McConnell and Servaes (1995) find that book leverage is positively correlated to firm value when investment opportunities are scarce, which is consistent with the hypothesis

that debt alleviates the overinvestment problem. In contrast, Agrawal and Knoeber (1996) and Beiner, Drobetz, Schmid, and Zimmermann (2003) find no relation between leverage and firm performance and argue that leverage is just employed optimally in conjunction with the other control mechanisms considered in their studies.

3. Methodological approach

Several papers estimated the impact of firm-level corporate governance practices on firm value by regressing Tobin's Q on a corporate governance index and including some (exogenous) control variables (e.g., Black (2001)). However, the existence of alternative control mechanisms, such as insider stock ownership or outside blockholdings, which are usually not included in the index, may lead to an omitted variables bias. Furthermore, because such regressions fail to account for possible interrelations among the different control mechanisms, the results suffer from endogeneity problems. Therefore, following Agrawal and Knoeber (1996), Beiner, Drobetz, Schmid, and Zimmermann (2003), and Schmid (2003), we specify a simultaneous equations system, where each control mechanism is the dependent variable in one of the equations. The choice of any of the six control mechanisms may depend upon choices of the five other control mechanisms, but these choices will depend on other (exogenous) factors as well. Thus, each equation includes all other control mechanisms as well as additional exogenous explanatory variables. To investigate the effect of the different control mechanisms on firm valuation, a seventh equation with Tobin's Q as the dependent variable is also added to the system. At the same time, Tobin's Q is included as an explanatory variable in the other six equations of the system to allow for possible interrelations with the six control mechanisms. In this section we provide a detailed description of each equation in our system.

The first equation has our corporate governance index, denoted as *CGI*, as the dependent variable. We provide a more detailed description of *CGI* in section 4.1, but it is important to note that the index for the most part refers to the recommendations and suggestions contained in the Swiss Code of Best Practice. It is therefore not directly related to the other five control mechanisms we use in our analysis, i.e., share ownership by officers and directors, shareholdings by large outside blockholders, board size, leverage, and outside representation on the board. Nevertheless, we expect that *CGI* depends on choices of the other control mechanisms as well as on additional exogenous control variables. As a first exogeneous variable, we include firm size, *Lnassets*, as measured by the natural logarithm of total assets. From a theoretical point of view, the effect of size on a firm's corporate governance is ambiguous. On the one hand, large firms may have more severe agency problems, because it is harder to monitor them or according to Jensen's (1986) "free cash flows" argument. Therefore, they may voluntarily choose stricter governance rules to avoid high agency costs. On the other hand, small firms may have better growth opportunities and greater needs for external financing and better control mechanisms. Empirical studies provided convincing evidence of a positive relationship between size and the quality of a firm's corporate governance principles.[5] As a second variable, we include a measure of growth opportunities. Firms with good growth opportunities will need to raise external financing in order to expand and may therefore find it optimal to improve their corporate governance. The underlying notion is that better governance and better minority shareholder protection will likely lead to lower cost of capital.[6] Lacking alternative measures of growth, we follow Klapper and Love (2003) and use the average annual sales growth over the past three years (2000-2002), *Growth*. To capture a possible interrelation between operating performance and firm specific corporate governance, we also include the

[5] See Klapper and Love (2003) and Drobetz, Schillhofer, and Zimmermann (2004).
[6] See Lombardo and Pagano (2000) and Himmelberg, Hubbard, and Love (2001).

return on assets, *ROA*. This variable is defined as operating profit in 2002 divided by the average of the 2002 starting and ending values of total assets. Further, Klapper and Love (2003) argue that the composition of a firm's assets will affect its contracting environment. Intuitively, it is easier to monitor and harder to steal fixed assets (e.g., machinery and equipment) than "soft" capital (e.g., intangibles and R&D capital). Accordingly, a firm operating with a higher proportion of intangible assets may find it optimal to adopt stricter control mechanisms to prevent misuse of these assets, i.e., one should observe a positive relation between *CGI* and the proportion of intangible to total assets, *Intang*. We also include *SMI*, a dummy variable, which is equal to one if a firm is included in the Swiss Market Index (and zero otherwise), comprising the 26 largest Swiss firms, as of end 2002. Due to stronger investor pressure from abroad, one would expect a positive effect of the dummy variable *SMI* on our corporate governance index. Finally, as argued by Klapper and Love (2003), there are reasons to presume that firms, which trade in the U.S., should have better corporate governance rankings. First, firms listed on a U.S. exchange are required to comply with U.S. GAAP accounting standards, which might improve their transparency. Second, firms with a listing on a U.S. stock exchange are subject to many SEC laws and regulations that protect minority shareholders. Thus, we also add a dummy variable indicating whether a firm trades American Depository Receipts (ADRs) in the United States, labeled as *ADR*, and expect it to have a positive effect on *CGI*. Finally, to control for industry effects, we include 12 dummy variables, *Industry*, in all seven equations of the system.

Assuming that all subsequent relations are linear and denoting the other six corporate governance mechanisms (also including Tobin's Q) as CGM_{ij}, the first equation of our system is:

$$CGI_i = \alpha_0 + \sum_{j=1}^{6} \alpha_j \cdot CGM_{ij} + \alpha_7 \cdot Lnassets_i + \alpha_8 \cdot Growth_i + \alpha_9 \cdot ROA_i + \alpha_{10} \cdot Intang_i + \alpha_{11} \cdot SMI_i + \alpha_{12} \cdot ADR_i + \sum_{j=1}^{12} \alpha_{12+j} \cdot Industry_{ij} + \varepsilon_i \quad (1)$$

The second equation of our system uses the percentage of total shares owned by officers and directors, labelled as *Stocksod*, as the dependent variable. We expect *Stocksod* to be lower where the costs of such shareholdings are higher. These costs arise mainly from holding an under-diversified portfolio. As suggested by Agrawal and Knoeber (1996), we use the standard deviation of 60 monthly returns of a firm's stock, *Vola*, and firm size, *Lnassets*, as indicators of the associated costs.[7] Thus, we expect *Stocksod* to be negatively related to *Vola*. Because very large amounts of money are necessary to hold a significant fraction of a large company, *Stocksod* is also expected to be negatively related to *Lnassets*. In contrast, we include *Growth* as an indicator of expected growth opportunities, which increases the attractiveness of holding shares of the company. Additionally, we include the natural logarithm of the number of years since inception of the firm as a private limited company, *Lnage*. One would expect shareholdings of officers and directors to be higher in younger firms. Furthermore, voting restrictions could allow some shareholders to practically dominate a firm even if they own significantly less than 50% of the firm's stock. We therefore expect a positive relationship between *Stocksod* and the dummy variable *Scat*, which is equal to one if the firm has different share categories with different voting rights attached and zero otherwise. Finally, we include a dummy variable, which is equal to one if the CEO or the president of the board is also the founder of the firm and zero otherwise. The symbol for this dummy variable is *Foun-*

[7] Firms with return data not available for the full period of 60 months are not excluded from our sample if we have return data for at least 9 months.

der. We expect *Stocksod* to be positively related to *Founder*. Summarizing, the second equation of our system is:

$$Stocksod_i = \alpha_0 + \sum_{j=1}^{6} \alpha_j \cdot CGM_{ij} + \alpha_7 \cdot Vola_i + \alpha_8 \cdot Lnassets_i + \alpha_9 \cdot Growth_i + \alpha_{10} \cdot Lnage_i + \alpha_{11} \cdot Scat_i + \alpha_{12} \cdot Founder_i + \sum_{j=1}^{12} \alpha_{12+j} \cdot Industry_{ij} + \varepsilon_i \quad (2)$$

The dependent variable in the third equation of our system is *Blockout*, which is the percentage of cumulated voting rights exercised by large outside blockholders owning 5% or more of the firm's equity. Similar to equation (2), we expect *Blockout* to be negatively related to the costs of outsider shareholdings. Again, we use *Vola* and *Lnassets* as indicators of these costs. Accordingly, *Blockout* should be negatively related to both proxies. For the same reason as for *Stocksod*, we expect *Blockout* to be positively related to *Growth*. Zeckhauser and Pound (1990) argue that the higher a firm's R&D intensity, the more diffuse is the information structure, and the more difficult is outside monitoring. Large investors will recognize the problems associated with asymmetric information and, hence, *Blockout* is expected to be negatively related to R&D intensity. Because R&D data for the year 2002 was not available for the firms in our sample, we use the ratio of intangible assets to total assets, *Intang*, as a proxy for information asymmetry. As for *Stocksod*, we also expect a positive relationship between *Blockout* and a dummy variable for the existence of more than one share category, *Scat*. Finally, we include the number of outside blockholders, *Blockonr*, as a control variable in our system. Summarizing, the third equation is:

$$Blockout_i = \alpha_0 + \sum_{j=1}^{6} \alpha_j \cdot CGM_{ij} + \alpha_7 \cdot Vola_i + \alpha_8 \cdot Lnassets_i + \alpha_9 \cdot Growth_i + \alpha_{10} \cdot Intang_i + \alpha_{11} \cdot Scat_i + \alpha_{12} \cdot Blockonr_i + \sum_{j=1}^{12} \alpha_{12+j} \cdot Industry_{ij} + \varepsilon_i \quad (3)$$

The fourth equation in our system has the number of directors on the board, labeled as *Bsize*, as the dependent variable. As exogenous control variables we include firm size, *Lnassets*, a dummy variable that is one if the state owns more than 5% of the firm's equity and zero otherwise, denoted as *Sown*, and the return on assets, *ROA*. We expect large firms to have larger boards of directors and, hence, a positive relationship between *Bsize* and *Lnassets* should show up in a regression. Following Beiner, Drobetz, Schmid, and Zimmermann (2003), *Sown* must be included to account for the possibility that political influences lead to presumably larger boards with a disproportionate number of government representatives. Thus, *Sown* is expected to be positively related to *Bsize*. As hypothesized by Yermack (1996), small boards could increase firm performance, or depending on the direction of causality, firms might adjust board size in response to past performance. To capture a possible interrelation between operating performance and board size, we include *ROA*. Hence, the fourth equation in our system is:

$$Bsize_i = \alpha_0 + \sum_{j=1}^{6} \alpha_j \cdot CGM_{ij} + \alpha_7 \cdot Lnassets_i + \alpha_8 \cdot Sown_i + \alpha_9 \cdot ROA_i + \sum_{j=1}^{12} \alpha_{9+j} \cdot Industry_{ij} + \varepsilon_i \tag{4}$$

The dependent variable in the fifth equation of our system is *LV*, as measured by the ratio of total (non-equity) liabilities to total assets (Rajan and Zingales (1995)). As suggested by Jensen's (1986) free cash-flow hypothesis, we expect mature firms with substantial cash flows to use more debt in order to discipline managers. We use two different variables to proxy for the maturity of a firm. The first is *Lnassets*, expecting that more mature firms tend to be larger, and the second is the firm's age, *Lnage*. Additionally, we include a dummy variable, which is one if the firm paid a dividend in 2003 (based on the earnings of 2002), denoted as *Div*. Be-

cause the availability of internal funds provides an alternative to debt financing, we expect a negative relationship between *Div* and *LV*. If a firm has expected future growth opportunities, debt servicing requirements can limit management's ability to pursue positive net present value projects, leading to ex post underinvestment (Myers (1977)). Consistently, Drobetz and Fix (2003) report lower leverage ratios for Swiss firms with favorable growth opportunities. Accordingly, we also expect a negative relationship between *Growth* and *LV*. To capture a possible relationship between operating performance and leverage, we also include *ROA*. Summarizing, the fifth equation in our system is:

$$LV_i = \alpha_0 + \sum_{j=1}^{6} \alpha_j \cdot CGM_{ij} + \alpha_7 \cdot Lnassets_i + \alpha_8 \cdot Lnage_i + \alpha_9 \cdot Div_i + \alpha_{10} \cdot Growth_i + \alpha_{11} \cdot ROA_i + \sum_{j=1}^{12} \alpha_{11+j} \cdot Industry_{ij} + \varepsilon_i \quad (5)$$

Finally, the percentage of outside (non-executive) directors on the board, *Outsider*, is the dependent variable in the sixth equation of our system. The first control variable we include is *Ceop*, a dummy variable, which is equal to one if the CEO is the president of the board at the same time. While this helps to alleviate coordination and communication problems between the CEO and the board of directors, it prevents an independent monitoring of the CEO and the top management by the board of directors. Shivdasani and Yermack (1999) argue that a situation where the CEO is at the same time president of the board leads to a concentration of power and the election of less independent board members. Accordingly, we expect a negative relationship between *Ceop* and *Outsider*. We also include the *Founder* dummy variable, because founding CEOs and presidents of the board may withdraw from their professional positions but retain their stock holdings of the firm, still having enough power to influence the composition of the board. To control for the effect of government ownership on board com-

position, we also include the dummy variable *Sown*. Finally, to capture a possible relationship between board composition and growth opportunities as well as operating performance, we include *Growth* and *ROA*, respectively, as exogenous explanatory variable in the sixth equation. We then have:

$$Outsider_i = \alpha_0 + \sum_{j=1}^{6} \alpha_j \cdot CGM_{ij} + \alpha_7 \cdot Ceop_i + \alpha_8 \cdot Sown_i + \alpha_9 \cdot Founder_i + \alpha_{10} \cdot Growth_i + \alpha_{11} \cdot ROA_i + \sum_{j=1}^{12} \alpha_{11+j} \cdot Industry_{ij} + \varepsilon_i \quad (6)$$

To examine the cross-sectional relationship between the control mechanisms and firm performance, the dependent variable in the last equation of our system is Tobin's Q. Following Yermack (1996), Beiner, Drobetz, Schmid, and Zimmermann (2003), and Schmid (2003) we include two variables to control for growth opportunities: *Lnassets* and *Growth*. We expect a positive relationship between *Growth* and *Q* and a negative influence of *Lnassets* on *Q*, because growth opportunities should be lower for larger firms. Based on simple valuation models, *Q* may additionally depend on *ROA* and *Beta*. *Beta* is the market beta estimated by regressing the firm's monthly stock returns over the past five years on the respective returns of the market as proxied by the Swiss Performance Index (SPI). Summarizing, the final equation in our system is:

$$Q_i = \alpha_0 + \sum_{j=1}^{6} \alpha_j \cdot CGM_{ij} + \alpha_7 \cdot Lnassets_i + \alpha_8 \cdot Growth_i + \alpha_9 \cdot ROA_i + \alpha_{10} \cdot Beta_i + \sum_{j=1}^{12} \alpha_{10+j} \cdot Industry_{ij} + \varepsilon_i \quad (7)$$

Our empirical analysis proceeds in three steps: First, we estimate OLS regressions where firm value depends only on a single control mechanism. Similar estimations have been standard in

the literature, but they ignore the influence of alternative mechanisms on firm performance and the possible endogeneity of these mechanisms. In the second step, we estimate equation (7) of our system using OLS to examine the effects of all control mechanisms simultaneously. Finally, to avoid incorrect inferences due to possible endogenous relationships between the different governance mechanisms themselves as well as between the governance mechanisms and Tobin's Q, we estimate equation (7) along with equations (1)-(6) in a simultaneous system of equations using 3SLS. This procedure treats Q as endogenous along with the six control mechanisms, allowing each of the mechanisms to affect Q, but also allowing Q to affect the choice of each mechanism. A comparison of the 3SLS estimates with the OLS estimates of equation (7) allows a direct inspection of the differences that arise from any possible endogeneities.

Our system of equations includes 15 exogenous and seven endogenous variables. The order condition for identification states that if an equation is to be identified, the number of predetermined variables excluded from the equation must be greater than or equal to the number of included endogenous variables minus one. The list of included endogenous variables contains variables on the left-hand side and the right-hand side of the equation. Therefore, at least six of the exogenous variables must be excluded from any single equation to identify the system. However, our development of equations (1)-(7) is motivated independently of the requirement for these identification restrictions to be met. In fact, all equations in our system are overidentified and at least three variables could be included to any equation without jeopardizing the identification.

4. Definition of variables and data

4.1 Definition of variables

In this section we provide a detailed description of the variables we use in our empirical analysis. First, our Corporate Governance Index (*CGI*) is based on responses to a detailed questionnaire, which was mainly based on the suggestions and recommendations of the Swiss Code of Best Practice. Similar indices have been constructed by Black, Jang, and Kim (2003) and Drobetz, Schillhofer, and Zimmermann (2004). The survey was sent out to all Swiss firms quoted at the Swiss Stock Exchange (SWX) with the exception of investment companies and was completed between May and July 2003.[8] Where necessary, the data was supplemented and verified on the basis of annual reports and web pages. Our index consists of 38 governance attributes divided into the following five categories: (1) corporate governance commitment, (2) shareholders' rights, (3) transparency, (4) management and supervisory board matters, and (5) auditing. We assume that all five categories have the potential to mitigate hidden information and moral hazard problems in a company. To qualify for inclusion into the *CGI*, an attribute must refer to a governance element that is not (yet) legally required and needs to be considered as an international market practice of "good corporate governance". Most important, all of the 38 governance attributes can be initiated and implemented by a firm's decision makers. A sample of representative questions for each category is listed below:

- Corporate governance commitment: Is there a governance officer who reports to the board of directors on a regular basis?

[8] The questionnaire is available from the authors upon request (in German or French).

- Shareholders' rights: Does the firm strictly follow the one share-one vote principle (e.g., are no preferential shares and participation certificates outstanding)?
- Transparency: Is the agenda of the general meeting, the annual report, any counter proposals, management comments and voting results of all shareholders available on the internet in a timely manner (in English and German, French, or Italian)?
- Management and supervisory board matters: Are there firm-specific rules to handle conflicts of interests and own account trading for managers and members of the board of directors?
- Auditing: Are there firm-specific rules to ensure that the auditor does not perform other services for the firm (e.g., consulting)?

The construction of our *CGI* is straightforward and transparent: First, each of the 38 governance attributes is assigned a value between 1 (minimum) and 5 (maximum). One point is added for each subsequent acceptance level of the respective attribute in a five-scale answering range. A higher acceptance level can be interpreted as an (earlier) active move by the firm's decision makers to improve its corporate governance system. This distinction in the governance quality is straightforward in almost all cases. Second, a simple sum over the 38 attributes is computed. While such a simple weighting scheme makes no attempt to accurately reflect the relative importance of the individual governance attributes, it has the advantage of being transparent and allowing easy interpretation. Finally, the overall *CGI* is normalized to have a value between 0 and 100, with better-governed firms having higher index scores.

The other corporate governance mechanisms are defined as follows: The percentage of shares owned by officers and directors, *Stocksod*, is the sum of all shares owned by officers and executive as well as non-executive members of the board divided by the total number of shares

outstanding. For companies with more than one share category, which applies to about 22% of our sample, the ownership of different share categories is weighted by their respective nominal values.[9] *Blockout* denotes the percentage of cumulated voting rights exercised by large outside investors with voting rights exceeding 5%. *Bsize* is the number of directors on the firm's board. *Outsider* refers to outside membership on the board, measured by the percentage of board seats held by directors without any executive function. *LV* denotes firm leverage and is calculated as the ratio of total (non-equity) liabilities to total assets. In addition to the six endogenous control mechanisms, 15 exogenous control variables are included in our system of equations. They have already been described in section 3, and a summary of all variables employed is given in Table 1.

[Insert Table 1 about here]

Finally, our measure of firm valuation is Tobin's Q, alternatively simply labeled as *Q*. As suggested by Chung and Pruitt (1994), Perfect and Wiles (1994), Agrawal and Knoeber (1996), Kang and Stulz (1996), and Loderer and Peyer (2002), among others, Tobin's Q is estimated as the ratio of the market value of equity plus the book value of debt to the book value of total assets. To avoid that fluctuations in the market value of firms' equity influence our results, we follow Beiner, Drobetz, Schmid, and Zimmermann (2003) and Schmid (2003) and compute the market value of equity as the mean of daily observations during 2002. For some firms daily stock price data is not available for all share categories on Datastream, and

[9] Weighting has to be based on nominal values because market values are not available for all share categories of the firms in our sample. However, Schmid (2003) shows that for the 116 firms of his total sample of 145 Swiss firms for which he has market values for all existing share categories, the values of *Stocksod* are very close to those obtained by using nominal values to weigh the ownership of different share categories.

we replaced them by the mean of the 2001 and 2002 year end values of total market capitalization obtained from Worldscope.

4.2 Sample and data description

As a starting point we target all 275 firms quoted at the Swiss Stock Exchange (SWX) by the end of 2002. The exclusion of investment companies leaves us with a sample of 235 firms receiving our questionnaire. From these 235 firms 120 returned our questionnaire, which implies a response rate of 51.06%. Another 9 firms must be dropped because no data on stock ownership of officers and directors is available. Finally, the exclusion of two obvious outliers concerning their value of Tobin's Q and return on assets leaves us with a sample of 109 firms for our cross-sectional regression analysis.

Data has been collected from different sources besides the questionnaire and generally refers to the reporting period from January 2002 to December 2002. *Stockod* has been collected from the 2002 annual reports of the companies covered in this study. Data for the variables *Blockout*, *Bsize*, *Blockonr*, *Ceop*, *Lnage*, *Scat*, and *Sown* stem from the website of "Finanz & Wirtschaft"[10] and the "Swiss Stock Guide 2002/2003". The necessary data to compute *Q*, *LV*, *Beta*, *Div*, *Growth*, *Intang*, *Lnassets*, *ROA*, and *Vola* were obtained from Datastream and Worldscope. However, for most variables data was not available for all firms in our sample. Missing values were obtained directly from the companies' annual reports. We identified whether a firm trades ADRs on the NYSE, AMEX, or NASDAQ using the JP Morgan website.[11] *SMI* constituents are spotted from the website of the Swiss Stock Exchange (SWX).

[10] The website of 'Finanz und Wirtschaft', Switzerland's major financial newspaper, is: www.finanzinfo.ch.
[11] The website is: www.adr.com.

Finally, the variables *CGI*, *Industry*, *Founder*, and *Outsider* are based on the questionnaire answers.

Table 2 shows descriptive statistics of all variables included in our analysis. The average value of Tobin's Q is 1.34, and the median is 1.06, indicating that Swiss firms, on average, invest in positive NPV projects. The distribution of our corporate governance index is displayed in Figure 1. The mean of *CGI* is 58.46 and the median 59.21, indicating a relatively symmetric distribution. Additionally, Figure 1 reveals that there are substantial differences in firm level corporate governance between the 109 firms in our sample (the minimum value is 25.00, and the maximum value is 90.13). This suggests that our governance proxies are adequately selected to reach a sufficiently wide distribution, which mitigates a possible selection bias in our results. Finally, Figure 1 shows that, as expected, SMI firms (in dark grey) have significantly higher values of *CGI* than the other firms in our sample.

[Insert Figure 1 about here]

As Table 2 reveals, officers and directors hold on average 12.10% of the equity of a firm. However, the median of 0.60% is much smaller, indicating that there are some firms in our sample where officers and directors hold very large fractions of total equity. A comparison of these values to the sample of U.S. firms used by Loderer and Martin (1997) confirms that average insider shareholdings are similar in Switzerland and the U.S. However, the median is a lot smaller in our sample and, hence, insider shareholdings are much more skewed in Switzerland. The mean of *Blockout* is 32.74%. The average board size is 7.35 in our sample, which roughly equals the optimal size of seven or eight directors, as has been hypothesized by Lipton and Lorsch (1992) and Jensen (1993). This is only about half of the average board size reported by Yermack (1996) for U.S. firms, but larger than that reported by Eisenberg,

Sundgren, and Wells (1996) for their Finnish sample. The average leverage ratio of 62.34% is very similar to the values reported by Beiner, Drobetz, Schmid, and Zimmermann (2003), Schmid (2003), and Drobetz and Fix (2003) for Switzerland and Peasnell, Pope, and Young (2003) for the U.K. The average value of *Outsider* is 89.27%, which strongly differs from the much lower values of 54% and 60% reported by Yermack (1996) and Barnhart, Marr, and Rosenstein (1994), respectively, for U.S. companies and 44% reported by Peasnell, Pope, and Young (2003) for U.K. companies. This finding is especially surprising, because founding families are still regarded as an important factor in corporate Switzerland.

Table 2 further shows several other interesting results, which we only briefly summarize: about 22% of the firms in our sample have more than one share category, in 15% of the firms the CEO is also president of the board, in 10% of the firms the CEO or the president of the board founded the firm, about 11% of the firms trade American Depository Receipts (ADRs) in the United States, and the state is a significant shareholder of about 12% of the firms.

[Insert Table 2 about here]

Table 3 shows the correlation coefficients between Tobin's Q and the six control mechanisms. Of special interest, and consistent with our general notion, is the positive correlation coefficient of 0.24 between our corporate governance index, *CGI*, and Tobin's Q. In fact, this is the highest positive correlation coefficient between Tobin's Q and any other variable. *Stocksod* and *Bsize* are also positively correlated with Tobin's Q. In contrast, *Blockout*, *LV*, and *Outsider* are all negatively correlated with *Q*. Clearly, the negative correlation coefficient between *Stocksod* and *Blockout* occurs by construction and, hence, should not come as a surprise. It is also important to note that *CGI* is a proxy that incorporates a broad range of governance issues. However, as already mentioned above, it does not include the additional gov-

ernance mechanisms we use in our analysis. This is forcefully shown by the low correlation coefficients between *CGI* and the other five control mechanisms.

[Insert Table 3 about here]

5. Empirical results

In this section we report our empirical results. Table 4 presents the results from the OLS regressions of *Q* on individual control mechanisms along with the exogenous control variables included in equation (7) of our system. Column (1) shows that *CGI* has a statistically significant positive effect on firm valuation. This supports our hypothesis that firms with better corporate governance have a higher market valuation. The only additional control mechanism, which exhibits a statistically significant coefficient, is *Bsize* in column (5). The inclusion of a quadratic term *Stocksod^2* in column (3) reveals evidence of a curvilinear relationship between shareholdings of officers and directors and firm valuation. This result is consistent with the findings in Morck, Shleifer, and Vishny (1988), McConnell and Servaes (1990), and Schmid (2003) and suggests that higher shareholdings of officers and directors are associated with higher firm valuation up to some point. The negative effect on firm value for levels of *Stocksod* beyond this point might be explained by some form of entrenchment (e.g., directors controlling a substantial fraction of the firm's equity may have enough voting power and/or influence to guarantee their employment and attractive salaries, they may employ less professional managers, etc.). Thus, for high levels of *Stocksod* the "convergence-of-interests effect" may be dominated by an "entrenchment effect". To summarize, neglecting the influence of any other control mechanism, our corporate governance index, board size, and shareholdings of officers and directors have a statistically significant influence on firm valuation. The coefficients on the exogenous control variables in the lower part of Table 4 exhibit the expected

signs in all five equations, and a Wald test for the simultaneous significance of all coefficients (except the constant and the industry dummies) always rejects the null hypothesis that they are jointly zero. The adjusted R-squares are between 0.41 and 0.45; they are very similar and quite high for all seven equations.

However, these results may be misleading because they ignore the existence of other control mechanisms and the interdependencies between these mechanisms. To explore this possibility, column (8) in Table 4 presents results for an OLS regression of firm valuation as measured by Tobin's Q on all control mechanisms simultaneously. This regression allows for the adoption of different control mechanisms, but it does not account for any interdependencies in the choices of the control mechanisms. A comparison with the regression results reported in column (1) reveals that the coefficient on *CGI* remains statistically significant at the 5% level. Even the magnitude of the coefficient remains virtually unchanged. The coefficient on *Bsize* is also of similar magnitude and remains statistically significant. The inclusion of the quadratic term *Stocksod^2* in column (9) shows that the curvilinear relationship between shareholdings of officers and directors and firm valuation is robust to the inclusion of the other control mechanisms as well. Overall, therefore, allowing for the availability of alternative control mechanisms does not qualitatively change the results obtained from looking at the effect of each governance mechanism on firm valuation separately.

[Insert Table 4 about here]

Finally, taking into account possible interrelations among the control mechanisms, Table 5 reports the coefficient estimates obtained by estimating simultaneously all seven equations of our system by 3SLS. This system treats firm valuation as well as the six governance mechanisms as endogenous, and it allows each of them to affect all the others. Thus, a comparison

of the 3SLS estimates in column (7) of Table 5 with the OLS estimates in column (8) of Table 4 allows a direct inspection of the differences that arise from the possible endogeneity between the different control mechanisms themselves as well as the control mechanisms and Tobin's Q. Most importantly, the coefficient on *CGI* increases in magnitude almost by a factor of 10 and is statistically significant at the 1% level. This effect is also large from an economic point of view. The point estimate of the coefficient on *CGI* implies that an increase in the corporate governance rating by one point results in an increase of Tobin's Q by 8.52%, or put differently, an increase of market capitalization by 8.52% of a company's book asset value. Our results further show that shareholdings of officers and directors also have a statistically significant effect on firm valuation. Finally, while the coefficient on *Bsize* is no longer statistically significant at any conventional level, our 3SLS results suggest that LV has a significant positive effect on firm valuation, which is consistent with both a trade-off theory of the capital structure and Jensen's (1986) free cash-flow theory. All other control mechanisms remain insignificant.

As discussed above, estimating a simultaneous system of equations is particularly appealing, because it allows us to investigate the interdependencies between the choice of the six control mechanisms and Tobin's Q. For example, firms with higher market values could simply be more likely to choose better governance structures. Specifically, they can do so for two possible reasons. First, firm insiders may believe that better governance structures will further raise firm value. Accordingly, there is a causal relationship, but ordinary least squares coefficients will overstate the actual connection. Second, firms may adopt good governance to signal that insiders behave well. In this case, there could be no causal connection at all. Rather, the signal of management quality, and not the firm's governance practices, affects firm value. In fact, the coefficient estimates of the endogenous variables in the line labeled Q in Table 5 reveal

that higher values of *CGI* not only lead to higher firm valuation, but that there is also reverse causality, i.e., firms with higher values of Tobin's Q adopt better corporate governance practices. Thus, high *Q* firms are precursors in implementing the recommendations of the Swiss Code of Best Practice, as shown by the significant coefficient on *Q* in column 1. Firms with higher *Q*s also choose more leverage, as indicated by the significant coefficient in column 5. Controlling for growth, higher leverage further disciplines management by forcing it to pay out cash flows as interest payments (Jensen, 1986). Finally, another signal of good behavior of already high *Q* firms is to appoint a larger number of outside directors to the board, as revealed by the significant coefficient in column 6.

The negative and statistically significant coefficients on *Stocksod* in columns (1), (5), and (6) imply that high shareholdings of officers and directors are associated with lower values of *CGI*, lower leverage, and a smaller fraction of outside members on the board. These results suggest possible substitutions between *Stocksod* and the other three control mechanisms. For example, the negative relationship between *Outsider* and *Stocksod* is not surprising, because the incentive-alignment effects of managerial equity ownership reduce the demand for additional costly monitoring mechanisms. Consistently, several studies (e.g., Weisbach (1988), Denis and Sarin (1999), and Peasnell, Pope, and Young (2003)) report a negative relationship between managerial ownership and the proportion of outside members on the board. In addition, the negative relationship between *Stocksod* and *LV* can be explained by personal hedging motives of managers and directors (Smith and Stulz, 1985). Furthermore, the negative (although not significant) coefficients on *Stocksod* and *Blockout* in columns (2) and (3), respectively, suggest that monitoring by large outside blockholders is an alternative mechanism for higher insider shareholdings. Additionally, the negative coefficients on *Outsider* in column (1) and on *CGI* in column (6) suggest possible substitutions between *CGI* and *Outsider* as

well. Finally, the positive and statistically significant coefficient on *Bsize* in column (6) shows that there are more non-executive directors in larger boards. Overall, there seem to be some important interrelationships between the different control mechanisms employed in our study, which again underscores the advantage of a simultaneous equations framework to investigate the influence of different control mechanisms on firm performance.

The coefficients on the exogenous variables generally have the predicted sign, but they are often statistically insignificant. As hypothesized, *CGI* is higher for large firms. The coefficient on *Lnassets* is positive and significant at the 1% level. The coefficient on *SMI* is positive as well, indicating that firms included in the Swiss Market Index have higher values of *CGI* on average. In contrast to our expectations, the coefficient on ADR is negative. However, both coefficients are not statistically significant at any conventional level. *Growth* and *Roa* are both negative and statistically significant at the 1% level. This result is somewhat surprising and we do not have any persuasive ad-hoc explanations. One possibility may be that these firms have higher capital requirements because of their poor past performance and low profitability. However, to obtain any external financing, they are forced to improve their corporate governance. Finally, since it is easier to monitor and harder to steal fixed assets than "soft" capital, we expect that firms operating with a higher proportion of intangible assets may find it optimal to adopt stricter control mechanisms to prevent misuse of these assets. However, the coefficient on *Intang* is negative although not statistically significant.

Looking at *Stocksod*, the coefficient on *Lnassets* is negative as expected ex ante because very large amounts of money are necessary to hold a significant fraction of a large company. The existence of more than one share category, *Scat*, allowing some shareholders to practically dominate a firm even if they own significantly less than 50% of the firm's stock, is positively

related to *Stocksod*. *Stocksod* is also higher for firms where the CEO or the president of the board is the founder of the firm. However, in contrast to our expectations the coefficients on *Lnage* and *Vola* are positive and the coefficient on *Growth* is negative.

With respect to *Blockout*, the signs of the coefficients on *Lnassets, Vola*, *Scat*, and *Blockonr* are as expected ex ante, but only *Blockonr* is statistically significant at the 1% level. In contrast to our expectations, the sign on *Growth* is negative and the sign on *Intang* is positive, but both are not statistically significant.

Looking at *Bsize*, all exogenous variables exhibit the predicted signs and are statistically significant. For example, large firms have larger boards of directors. In addition, firms with significant government ownership have larger boards. On average, state ownership leads to 3.37 additional board members, all else equal. The statistically significant and negative coefficient on *ROA* is indicative of firms with lower operating performance having larger boards of directors.

As hypothesized, *LV* is higher for mature firms. The coefficients on *Lnassets* and *Lnage* are both positive and the former is statistically significant at the 5% level. The availability of internal funds, as measured by *Div*, which provides an alternative to debt financing, is expected to be negatively related to *LV*. However, the coefficient is positive but not statistically significant. Finally, the coefficients on *Growth* and *ROA* are both negative and statistically significant at the 1% and 5% level, respectively, indicating lower leverage ratios for firms with favorable growth opportunities, supporting a pecking order theory of the capital structure.

With respect to board composition, the fraction of outside board members seems to be negatively related to state ownership, the existence of a founding CEO or president of the board in a firm, past growth rates, and past operating performance. More importantly, consistent with

Shivdasani and Yermack (1999), the negative and statistically significant coefficient on *Ceop* suggests that the concentration of power associated with the CEO being president of the board by the same time leads to a concentration of power and the election of less independent board members.

[Insert Table 5 about here]

6. Robustness Tests

In this section, we conduct a number of robustness checks for our results. First, we employ an alternative measure of firm valuation. Following Loderer and Peyer (2002), LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (2002), Gompers, Ishii, and Metrick (2003), and others, we define an industry-adjusted Tobin's Q as Tobin's Q minus the median *Q* of the corresponding industry. Accordingly, we exclude the industry dummies from the regression equations. In contrast to our earlier findings, the results of an OLS regression of the industry-adjusted Tobin's Q (labeled *adjusted Q*) on the six control mechanisms and a set of control variables reveals that the coefficients on *CGI* and *Bsize* are no longer statistically significant. The results are reported in column (2) of Table 6 while, for easier comparison, column (1) repeats the results of the standard specification as reported in column (9) of Table 4. However, re-estimating our system of seven simultaneous equations with *Q* replaced by *adjusted Q*, we again uncover a positive and statistically significant, even though somewhat reduced, coefficient on *CGI* (see column (2) of Table 7). An increase in our corporate governance index by one point *causes* an increase of the industry-adjusted Tobin's Q by approximately 6%, on average. As the comparison with the results in column (7) of Table 5 (which is replicated for eased comparison in column (1) of Table (7)) reveals, all other coefficients are robust to the use of an industry-adjusted Tobin's Q as well.

Second, we use the market-to-book ratio, defined as the market value of common stock divided by the book value of common stock, as another alternative measure of firm value. As column (3) of Table 6 reveals, the coefficient on *CGI* remains positive and statistically significant at the 5% level. Furthermore, the coefficients on all other variables are similar to the values reported in column (1) of Table (6). Consistently, the simultaneous estimation of our system of equations produces similar results as obtained for *Q* and the industry-adjusted Tobin's Q. The coefficients on *CGI*, *Stocksod*, and *LV* even increase in magnitude and remain statistically significant at the 5% level or higher. Overall, these results confirm the conclusion that our corporate governance index is a major determinant of firm value; the perceived relationship is robust to the choice of several alternative measures.

Finally, we investigate whether our results depend on the weighting of the five categories of our index. As described in section 4.1, our index consists of 38 governance attributes divided into five categories. Since the 38 attributes are all equally weighted in our index, but the number of attributes differs across the five categories, this simple and transparent weighting scheme leads to different weights assigned to the five categories:

(1)	Corporate governance commitment:	13.16%
(2)	Shareholders' rights:	18.42%
(3)	Transparency:	13.16%
(4)	Management and supervisory board matters:	39.47%
(5)	Auditing:	15.79%

To check whether our results are robust to an equal weighting of the five categories, we construct an alternative index, labeled *CGI_12345*, which attributes a weight of 20% to each of the five categories. The results of an OLS regression (reported in column (4) of Table 6) and a

3SLS estimation of our complete system (reported in column (4) of Table 7) reveal that our results are robust to this alternative weighting scheme.

[Insert Table 6 about here]

[Insert Table 7 about here]

7. Conclusion

In this paper we address the question whether "good" corporate governance has a positive impact on firm valuation. While most previous studies used U.S. data to analyze this relationship, we investigate a broad sample of Swiss firms. This is interesting, because Switzerland has recently taken several important steps to improve its transparency standards in the corporate sector. For example, the "Directive on Information Relating to Corporate Governance" and the "Swiss Code of Best Practice" have become effective in 2002. Observing the intense public discussion since then, these new rules have undoubtedly increased the general consciousness for the importance of internationally recognized governance practices.

Our most important result supports the widespread hypothesis of a positive relationship between firm-level corporate governance and Tobin's Q. Specifically, an increase in the corporate governance index by one point (where the index ranges from 1 to 100) causes an increase of the market capitalization by roughly 8.52%, on average, of a company's book asset value. This result is robust to possible endogeneity, i.e., our analysis confirms that causation runs from corporate governance to firm value, but we also find evidence of reverse causality, with higher valued firms adopting better corporate governance practices.

Our results also emphasize the importance to control for possible interrelationships between different control mechanisms and Tobin's Q. To provide a comprehensive analysis of corpo-

rate governance, we use a broad corporate governance index and five additional control mechanisms: stock ownership by officers and directors, outside blockholdings, leverage, board size, and the fraction of outside directors on the board. Our corporate governance index for the most part relates to the recommendations and suggestions of the Swiss Code of Best Practice. However, one may suspect that important substitution effects between these six control mechanisms exist, i.e., where one mechanism is used less, others may be used more, resulting in the same valuation effects. Therefore, to avoid spurious results and capture the possibly complex interrelationships between the different control mechanisms, we develop a comprehensive system of seven simultaneous equations and apply three stage least squares (3SLS). This setup allows each of the control mechanisms to affect Tobin's Q, while at the same time Tobin's Q is also allowed to affect the choice of each mechanism. Our empirical results allow us to infer several other interesting results on the relationship between Tobin's Q and the different control mechanisms. For example, firm valuation significantly increases with higher shareholdings of officers and directors and higher leverage. In addition, higher shareholdings of officers and directors are associated with a lower fraction of outsiders on the board, which indicates possible substitution effects.

Our results also have an important policy implication. It is widely agreed that investor protection and prosecution capabilities form the basis for good corporate governance (e.g., Klapper and Love (2003)). Hence, although the task of reforming investor protection laws and improving judicial quality is a lengthy process, requiring the support of many interest groups, it seems like a worthwhile objective in the public interest. However, once adequate disclosure and transparency standards are in place, our results strongly suggest that it is ultimately the capital market, which rewards good governance practices and punishes bad ones. We con-

clude that corporate governance should be understood as a chance rather than an obligation from the perspective of a firm’s decision makers.

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Table 1 Summary of variables

Endogenous variables	
Q	Ratio of market value to book value of assets. Market value of assets is computed as market value of equity plus book value of assets minus book value of equity.
CGI	Index scaled to a value between 0 and 100, taking into account 38 different aspects of the corporate governance structure in the company
Stocksod	Percentage of equity owned by officers and directors (if SCAT = 1 nominal values of different share categories are used for weighting)
Blockout	Percentage of cumulated voting rights exercised by large investors with >5% of voting rights (excluding officers, directors, and related persons)
Bsize	Number of directors on the board of the company
LV	Leverage, measured as the ratio of total (nonequity) liabilities to total assets
Outsider	Outsider membership on the board, measured by the percentage of board seats held by non-officers without relationship to the founding family (if any)
Exogenous variables	
ADR	1, if the company is issuing American Depositary Receipts; 0 otherwise
Beta	Beta estimated from 60 monthly stock returns
Blockonr	Number of outside shareholders with an equity stake >5%
Ceop	1, if the CEO is also the president of the board; 0 otherwise
Div	1, if the company paid out a dividend form the earnings of 2002; 0 otherwise
Founder	1, if the CEO or the president of the board founded the company; 0 otherwise
Growth	Average annual growth of sales over the past three years (2000-2002)
Industry	12 industry dummy variables
Intang	Ratio of intangible assets to total assets
Lnage	Natural log of age of the firm
Lnassets	Firm size, measured by the natural logarithm of book value of total assets
ROA	Ratio of operating income to total assets (return on assets)
Scat	1, if the firm has different share categories with different voting rights attached; 0 otherwise
SMI	1, if the company belongs to the Swiss Market Index; 0 ohterwise
Sown	1, if state owns >5% of the firm's equity; 0 otherwise
Vola	Standard deviation of stock returns estimated from 60 monthly stock returns

Table 2 Descriptive statistics of the endogenous variables

Variable	Mean	Median	S.D.	Maximum/ Minimum
Q	1.3390	1.0606	0.7618	5.6637 / 0.6004
CGI	58.4561	59.2105	14.3384	90.1316 / 25.0000
Stocksod	0.1201	0.0059	0.1899	0.7878 / 0.0000
Blockout	0.3274	0.2292	0.2923	1.0000 / 0.0000
Bsize	7.3486	7.0000	2.7161	16.0000 / 3.0000
LV	0.6234	0.6266	0.2183	0.9855 / 0.0890
Outsider	0.8927	1.0000	0.1333	1.0000 / 0.4000
ADR	0.1101	0.0000	0.3145	1.0000 / 0.0000
Beta	0.7933	0.6261	0.5826	2.2455 / -0.0843
Blockonr	1.7064	2.0000	1.3492	5.0000 / 0.0000
Ceop	0.1468	0.0000	0.3555	1.0000 / 0.0000
Div	0.7339	1.0000	0.4439	1.0000 / 0.0000
Founder	0.1009	0.0000	0.3026	1.0000 / 0.0000
Growth	0.1277	0.0597	0.4188	3.9722 / -0.6080
Intang	0.0756	0.0261	0.0968	0.3727 / 0.0000
Lnage	3.6513	3.8067	1.2397	6.2766 / 0.6931
Lnassets	14.2414	13.9571	2.1072	20.8897 / 9.1714
ROA	0.0215	0.0365	0.0908	0.1861 / -0.6002
Scat	0.2202	0.0000	0.4163	1.0000 / 0.0000
SMI	0.1835	0.0000	0.3889	1.0000 / 0.0000
Sown	0.1193	0.0000	0.3256	1.0000 / 0.0000
Vola	0.1004	0.0927	0.0515	0.2589 / 0.0061

This table includes summary statistics of all variables included in the study. The sample size is 109.

Table 3 Correlation matrix between control mechanisms and Tobin's Q

	CGI	*Stocksod*	*Blockout*	*Bsize*	*LV*	*Outsider*
Q	0.2417	0.0785	-0.1475	0.0296	-0.2457	-0.1247
CGI		-0.0449	-0.3688	0.0725	-0.0171	0.0116
Stocksod			-0.2152	-0.0431	-0.3252	-0.1684
Blockout				0.1787	0.2035	0.1678
Bsize					0.2454	0.3062
LV						0.3472

This table contains correlation coefficients between Tobin's Q and the control mechanisms. The sample size is 109.

Table 4 Results from OLS regressions of Q on the different control mechanisms (N=109)

Independent	Dependent variable = *Q*								
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	1.4660 (0.1070)	1.3249 (0.1451)	0.9234 (0.2761)	1.5932* (0.0887)	1.6890* (0.0692)	1.5301* (0.0930)	1.7865* (0.0820)	1.8638* (0.0841)	1.0948 (0.2726)
CGI	**0.0083**** (**0.0305**)							**0.0090**** (**0.0357**)	**0.0103**** (**0.0121**)
Stocksod		0.4367 (0.2917)	**2.9953**** (**0.0113**)					0.2398 (0.5569)	**3.1241***** (**0.0068**)
Stocksod^2			**-4.6499**** (**0.0215**)						**-5.1943***** (**0.0093**)
Blockout				-0.2321 (0.2947)				-0.0592 (0.8046)	0.0719 (0.7451)
Bsize					**0.0450*** (**0.0673**)			**0.0510**** (**0.0385**)	**0.0466**** (**0.0420**)
LV						-0.4858 (0.1833)		-0.2287 (0.5208)	-0.4432 (0.2083)
Outsider							-0.3733 (0.3468)	-0.3842 (0.3179)	-0.0456 (0.9061)
Lnassets	-0.0781 (0.2316)	-0.0392 (0.5401)	-0.0193 (0.7532)	-0.0496 (0.4487)	-0.0838 (0.2330)	-0.0296 (0.6506)	-0.0448 (0.4905)	-0.1052 (0.1411)	-0.0774 (0.2414)
ROA	**2.3093***** (**0.0008**)	**2.2150***** (**0.0009**)	**2.0549***** (**0.0015**)	**2.1289***** (**0.0011**)	**2.4367***** (**0.0006**)	**2.0899***** (**0.0016**)	**2.1766***** (**0.0008**)	**2.5662***** (**0.0004**)	**2.3779***** (**0.0016**)
Growth	**0.8855***** (**0.0000**)	**0.8976***** (**0.0000**)	**0.8064***** (**0.0000**)	**0.8895***** (**0.0000**)	**0.9061***** (**0.0000**)	**0.8850***** (**0.0000**)	**0.8800***** (**0.0000**)	**0.8859***** (**0.0000**)	**0.7915***** (**0.0000**)
Beta	**0.3335***** (**0.0040**)	**0.3490***** (**0.0023**)	**0.3061***** (**0.0038**)	**0.3380***** (**0.0033**)	**0.3856***** (**0.0009**)	**0.3441***** (**0.0025**)	**0.3570***** (**0.0020**)	**0.3499***** (**0.0015**)	**0.2998***** (**0.0030**)
Industry	Included	Included	Included	Included	Included	Included	Included	Included	Included
Wald test	13.3475 (0.0000)	15.7560 (0.0000)	13.8053 (0.0000)	12.8459 (0.0000)	17.6207 (0.0000)	14.4505 (0.0000)	13.2121 (0.0000)	10.6580 (0.0000)	9.0213 (0.0000)
Adjusted R^2	0.4224	0.4142	0.4506	0.4093	0.4193	0.4134	0.4071	0.4274	0.4708

Estimates from OLS regressions of Tobin's Q on individual control mechanisms and all control mechanisms together along with the exogenous control variables included in equation (7) of our system of equations. The sample size is 109. A Wald test is performed for the simultaneous significance of all coefficients (except the constant and the industry dummies). The numbers in parentheses are probability values for two-sided tests. ***/**/* denotes statistical significance at the 1%/5%/10% level.

Table 5 Results from 3SLS regressions of six control mechanisms and Tobin's Q

Independent variable	Dependent variable						
	CGI (1)	*Stocksod* (2)	*Blocko* (3)	*Bsize* (4)	*LV* (5)	*Outsider* (6)	*Q* (7)
Constant	31.0760 (0.2493)	0.5152 (0.1113)	0.7494 (0.1246)	-7.0724* (0.0606)	0.6536 (0.1470)	0.9407*** (0.0000)	-2.4858 (0.2440)
CGI		0.0016 (0.7586)	-0.0057 (0.5067)	-0.0529 (0.3315)	**-0.0143***** (**0.0087**)	-0.0042 (0.1249)	**0.0852***** (**0.0001**)
Stocksod	**-48.5348**** (**0.0125**)		-0.3976 (0.3530)	**6.2098**** (**0.0377**)	**-0.9559**** (**0.0112**)	**-0.5395**** (**0.0238**)	**4.2576***** (**0.0048**)
Blocko	-1.6223 (0.8675)	-0.0814 (0.5319)		-1.0076 (0.5550)	-0.0089 (0.9580)	0.1026 (0.3917)	0.1749 (0.8249)
Bsize	-0.6461 (0.6126)	0.0162 (0.3589)	**0.0518**** (**0.0221**)		0.0040 (0.8520)	**0.0402***** (**0.0009**)	0.0521 (0.6032)
LV	**-52.7163***** (**0.0017**)	-0.3689 (0.2668)	0.6127 (0.1443)	-2.9283 (0.3938)		-0.2890 (0.1444)	**4.5716***** (**0.0001**)
Outsider	-24.6462 (0.2741)	-0.2747 (0.3600)	-0.4245 (0.3248)	4.0938 (0.2073)	-0.5030 (0.1847)		2.1002 (0.2366)
Q	**11.0209***** (**0.0001**)	0.0261 (0.5734)	0.0055 (0.9328)	-0.2083 (0.6272)	**0.1783***** (**0.0008**)	**0.0847**** (**0.0446**)	
SMI	1.3789 (0.5556)						
ADR	-0.3108 (0.9183)						
Intang	-1.3257 (0.8210)		0.0280 (0.9290)				
Lnassets	**5.5200***** (**0.0004**)	-0.0207 (0.4153)	-0.0430 (0.3050)	**1.0791***** (**0.0001**)	**0.0759**** (**0.0137**)		**-0.4841***** (**0.0012**)
ROA	**-54.0445***** (**0.0018**)			**-5.3684**** (**0.0409**)	**-0.7787**** (**0.0173**)	-0.1475 (0.3898)	**4.7292***** (**0.0006**)
Growth	**-11.3383***** (**0.0065**)	-0.0442 (0.3889)	-0.0495 (0.5046)		**-0.1847***** (**0.0080**)	**-0.1012**** (**0.0223**)	**1.0323***** (**0.0000**)
Beta							0.0419 (0.5982)
Lnage		0.0246 (0.1230)			0.0060 (0.6651)		
Scat		**0.0898***** **(0.0917)**	0.0362 (0.7046)				
Founder		0.0937 (0.1655)				-0.0070 (0.8887)	
Sown				**3.3704***** (**0.0001**)		**-0.1306*** (**0.0674**)	
Blockonr			**0.0930***** (**0.0000**)				
Ceop						**-0.1140***** (**0.0020**)	
Div					0.0105 (0.7557)		
Vola		0.1868 (0.6382)	-0.2263 (0.7066)				
Industry	Included	Included	Included	Included	Included	Included	Included
Wald test	79.4450 (0.0000)	31.7907 (0.0015)	54.9482 (0.0000)	79.3013 (0.0000)	27.8960 (0.0034)	32.2192 (0.0007)	43.7912 (0.0000)

Results from a three stage least squares (3SLS) estimation of equations (1)–(7) of our system of linear equations. The sample size is 109. A Wald test is performed for the simultaneous significance of all coefficients (except the constant and the industry dummies). The numbers in parentheses are probability values for two-sided tests. ***/**/* denotes statistical significance at the 1%/5%/10% level.

Table 6 Checks on the robustness of our OLS results

Independent Variable	Dependent variable			
	Q (1)	*Adjusted Q* (2)	*MTB-Ratio* (3)	*Q* (4)
Constant	1.0948 (0.2726)	-0.2818 (0.6803)	-0.8450 (0.6827)	1.0894 (0.2828)
CGI	**0.0103**** (**0.0121**)	0.0059 (0.1182)	**0.0255**** (**0.0234**)	
CGI_12345				**0.0084**** (**0.0331**)
Stocksod	**3.1241***** (**0.0068**)	**3.2003***** (**0.0036**)	**6.3850**** (**0.0230**)	**3.0568***** (**0.0087**)
Stocksod^2	**-5.1943***** (**0.0093**)	**-5.1450***** (**0.0086**)	**-9.9444**** (**0.0261**)	**-5.0872**** (**0.0120**)
Blockout	0.0719 (0.7451)	0.1174 (0.5121)	-0.4719 (0.4953)	0.0409 (0.8549)
Bsize	**0.0466**** (**0.0420**)	0.0284 (0.1961)	0.0687 (0.2860)	**0.0442*** (**0.0513**)
LV	-0.4432 (0.2083)	-0.0826 (0.7734)	2.5050 (0.1999)	-0.4423 (0.2153)
Outsider	-0.0456 (0.9061)	0.0290 (0.9324)	-0.9817 (0.3435)	-0.0357 (0.9284)
Lnassets	-0.0774 (0.2414)	-0.0428 (0.4090)	-0.0985 (0.5476)	-0.0699 (0.28889)
ROA	**2.3779***** (**0.0016**)	**1.8084***** (**0.0025**)	2.0447 (0.4639)	**2.3295***** (**0.0018**)
Growth	**0.7915***** (**0.0000**)	**0.7051***** (**0.0000**)	**0.9857***** (**0.0028**)	**0.7943***** (**0.0000**)
Beta	**0.2998***** (**0.0030**)	**0.2728***** (**0.0044**)	**0.7790***** (**0.0033**)	**0.3090***** (**0.0024**)
Industry	Included	Excluded	Included	Included
Wald test	9.0213 (0.0000)	9.2741 (0.0000)	5.0158 (0.0000)	8.7616 (0.0000)
Adjusted R^2	0.4708	0.3417	0.2805	0.4631

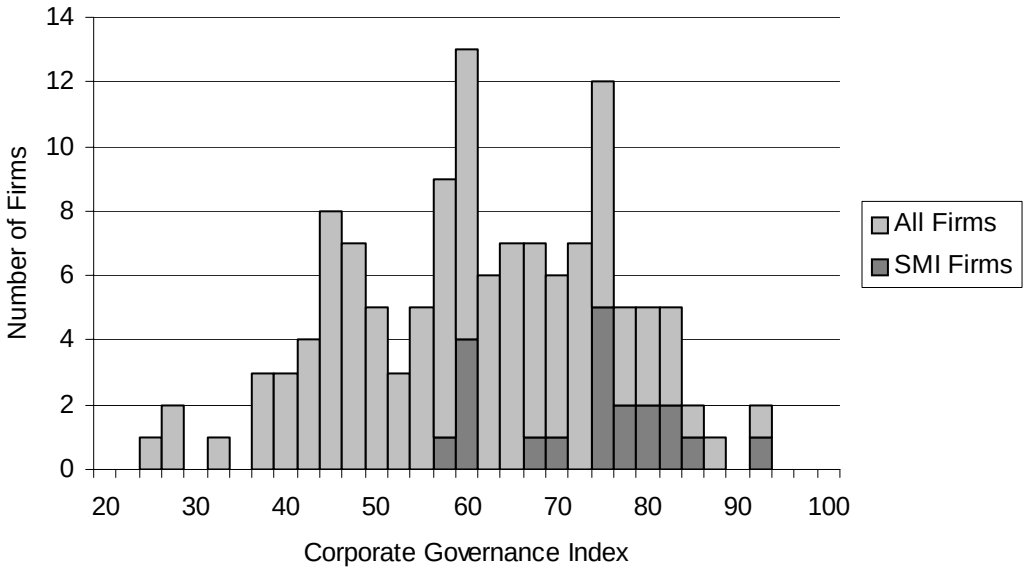
Columns (2) and (3) show estimates from OLS regressions of an industry-adjusted Tobin's Q and the market-to-book ratio, respectively, on all five control mechanisms together along with the exogenous control variables included in equation (7) of our system of equations. Column (3) reports the estimates of a regression of Q on an alternatively weighted governance index, the other five control mechanisms and the standard set of control variables. For eased comparison, column (1) shows the results of the standard specification as reported in column (9) of Table 4. The sample size is 109. A Wald test is performed for the simultaneous significance of all coefficients (except the constant and the industry dummies). The numbers in parentheses are probability values for two-sided tests. ***/**/* denotes statistical significance at the 1%/5%/10% level.

Table 7 Checks on the robustness of our 3SLS results (reported is only equation 7)

Independent variable	Dependent variable			
	Q (1)	*Adjusted Q* (2)	*MTB-Ratio* (3)	*Q* (4)
Constant	-2.4858 (0.2440)	-3.0608* (0.0676)	-9.0612* (0.0691)	-2.0806 (0.3153)
CGI	**0.0852*** (0.0001)**	**0.0597*** (0.0000)**	**0.1974*** (0.0000)**	
CGI_12345				**0.0782*** (0.0001)**
Stocksod	**4.2576*** (0.0048)**	**3.5194*** (0.0050)**	**7.9776** (0.0237)**	**3.2420** (0.0242)**
Blocko	0.1749 (0.8249)	0.1663 (0.7571)	-0.9283 (0.6119)	-0.5161 (0.4798)
Bsize	0.0521 (0.6032)	0.1138 (0.1735)	0.0530 (0.8227)	0.0343 (0.7232)
LV	**4.5716*** (0.0001)**	**3.3519** (0.0105)**	**10.9249*** (0.0001)**	**4.6713*** (0.0001)**
Outsider	2.1002 (0.2366)	1.8410 (0.2175)	5.3549 (0.1955)	2.0855 (0.2275)
Lnassets	**-0.4841*** (0.0012)**	**-0.3911*** (0.0015)**	**-0.9498*** (0.0055)**	**-0.4726*** (0.0010)**
ROA	**4.7292*** (0.0006)**	**3.4204*** (0.0013)**	**6.4265** (0.0441)**	**4.1434*** (0.0015)**
Growth	**1.0323*** (0.0000)**	**0.8980*** (0.0000)**	**1.4601** (0.0114)**	**1.0064*** (0.0000)**
Beta	0.0419 (0.5982)	0.0702 (0.4840)	0.0869 (0.6678)	0.0670 (0.4415)
Industry	Included	Excluded	Included	Included
Wald test	43.7912 (0.0000)	44.0990 (0.0000)	38.1663 (0.0000)	44.5869 (0.0000)

Coefficient estimates for equation (7) of the system of seven equations obtained by estimating the complete system simultaneously by 3SLS. Columns (2) and (3) show estimates obtained by replacing *Q* by an industry-adjusted Tobin's Q and the market-to-book ratio, respectively. Column (3) reports the estimates obtained by introducing an alternatively weighted governance index. For eased comparison, column (1) shows the results of the standard specification as reported in column (7) of Table 5. The sample size is 109. A Wald test is performed for the simultaneous significance of all coefficients (except the constant and the industry dummies). The numbers in parentheses are probability values for two-sided tests. ***/**/* denotes statistical significance at the 1%/5%/10% level.

Figure 1 The empirical distribution of our Corporate Governance Index (CGI)



The distribution of the survey-based corporate governance index (CGI) for 109 Swiss firms. The index represents an unweighted sum of the basis points (on a five-scale answering range) for all governance proxies in five the five categories (1) corporate governance commitment, (2) shareholders' rights, (3) transparency, (4) management and supervisory board matters, and (5) auditing. CGI is normalized to have a value between 0 and 100, with better-governed firms having higher index scores. Dark grey represents firms included in the Swiss Market Index (SMI).

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