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EXTERNAL FINANCE, FIRM GROWTH AND THE BENEFITS OF INFORMATION DISCLOSURE: EVIDENCE FROM FINLAND

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ABSTRACT: In this paper we study the relation between firm-level disclosure quality and the availability of external finance to firms. Using data on Finnish firms that are mostly private and small, we first estimate 'excess growth' made possible by external finance. We then show that the excess growth is associated with the quality of disclosure, and that at least a part of the association arises because firms with excess growth self-select. Interestingly, the association also seems to be related to *a priori* financially constrained firms. The results suggest that (a) the firms that resort to high quality disclosure are more likely to be the ones that grow at a rate that requires external finance and (b) that the excess growth and the choice of disclosure quality are jointly determined.

KEYWORDS: Corporate finance, information disclosure, auditing, financial constraints.

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'*Too much data can be a bad thing. It's quality of information that counts, not quantity*' [*The Downside of Disclosure, BusinessWeek, August 19-26, 2002*].

1. Introduction

The creditability of firms' disclosure has recently become a major issue both for financial market participants and policy-makers. In this paper we address this important issue of our times by asking: Are firms that resort to better quality disclosure the ones who raise external finance and grow therefore faster? If yes, what does explain this relation? Could it be that firms with limited financial resources but lucrative growth prospects choose high quality disclosure even in the absence of legal provisions to force truthful reporting?

If disclosure quality was an important means to limit opportunistic behavior by corporate insiders and to reduce informational asymmetries between the corporate insiders and outside investors, better *firm-level* disclosure quality should enhance the availability of external finance to firms. Raising external finance for growth may be especially difficult for small firms, because they are seldom unconstrained by internal finance (Carpenter and Petersen 2002) and because they are often informationally more 'opaque' than large firms (Petersen and Rajan 1994, Berger and Udell 1998). The received literature has carefully examined the benefits of firm-creditor relationships to such firms (Petersen and Rajan 1994, and Boot 2000), but no empirical study has, to our best knowledge, analyzed the association between disclosure quality and small and medium-sized firms' reliance on external finance. The aim of this paper is to deliver such an analysis.

To deliver the analysis, we pursue a three-phase empirical strategy. In the first phase, we follow Demirkgüç-Kunt and Maksimovic (1998, 2002) and estimate the external financing need of each individual firm in our sample to compute the 'excess growth' *made possible* by external finance. In the second phase, we examine the covariates of the excess growth and whether it is related to an indicator of the quality of disclosure. The indicator we use proxies the quality (reputation) of the external auditor a firm uses. Fi-

nally, in the third phase, we evaluate the drivers of the association between the excess growth and the indicator, should it exist. To this end, we apply methods familiar from the analyses of asymmetric information on insurance markets (Chiappori and Salanié 2000, and Dionne, Gouriéroux and Vanasse 2001) to evaluate the (joint) hypothesis that the excess growth correlates with the indicator because financially constrained firms with favorable growth prospects choose high-quality auditors (self-select) and because their use enhances the availability of external finance (Titman and Trueman 1986; see also Stocken 2000). In the third phase we also evaluate whether the association between the excess growth and the indicator is stronger for *a priori* financially constrained firms in the spirit of the analyses of capital market imperfections and investment (Fazzari, Hubbard and Petersen 1988, Hubbard 1998).

Using data on Finnish firms that are mostly private and small, this paper provides evidence that the firms that resort to high quality disclosure are indeed those that are more likely to grow at a rate that requires external finance. However, the results of our three-phase empirical analysis support *self-selection* by financially constrained firms and identify hence a specific mechanism through which firms apparently try to reduce barriers to external finance. We also find that the excess growth is associated with the quality of disclosure *only* for the *a priori* financially constrained firms. An interpretation of these findings is that firms with favorable private information about their growth opportunities and limited internal resources have an incentive to 'buy insurance' through disclosure quality against the risk of not being able to raise external finance. The interpretation is consistent with the predictions of the model analyzed by Titman and Trueman (1986).

While we favor the above interpretation of our results, others may be more agnostic, if not skeptic. Even so, the empirical findings of this paper have important implications for future research that addresses the creditability of firms' disclosure in general and the use of external auditors in particular. Our results also have implications for policy-makers who consider whether firms should be forced to 'talk'.

The remaining of the paper is organized as follows. In section 2, we describe our empirical strategy. The data are described in Section 3. In Section 4, we report the results. Section 5 concludes.

2. Disclosure Quality and External Finance

2.1 Theoretical Issues

A recurring theme in the corporate finance literature is that asymmetric information and incentive problems in the market for capital may lead to financial constraints that reduce corporate investment and growth (Hubbard 1998). However, only the firms whose financing needs exceed their internal resources suffer from financial market imperfections, should they exist. It is often argued that one of the most important of sources of financial market imperfections is the opacity of firms, i.e., the degree of asymmetric information between corporate insiders and investors (see, e.g., Petersen and Rajan 1994, Berger and Udell 1998, and Hubbard 1998). The informational opacity of a firm matters for the availability of external finance to the firm, because the less opaque the firm, the less there is scope for opportunistic behavior by the firm's insiders (less moral hazard) and the easier it is to determine the quality of the firm (less adverse selection) (La Porta, Lopez-de-Silanes, Shleifer and Vishny 1998, 2000, Healy and Palepu 2001, and Mitton 2002).

Firms' can reduce their informational opacity by voluntary disclosing high quality information on their business activities over and above mandated disclosure. Full and high quality disclosure is, however, rare because it is costly to firms. There can be many types of costs. Direct costs arise from producing and credibly disclosing information (Admati and Pfleiderer 2000; see also Hyytinen and Takalo 2002). Indirect costs arise for various reasons, such as the pro-competitive effects of disclosure (Bhattacharya and Chiesa 1995; see also Healy and Palepu 2001). Disclosure may also reduce the incentives of outside investors to acquire information (Boot and Thakor 2000).

High quality disclosure may be especially important for firms with growth options because for them standard disclosure is of too low quality. It is of too low quality in the sense that standard (mandated) disclosure often alleviates information asymmetry only to a limited extent. Because of the costs of high quality disclosure, such as the premium charged by internationally recognized auditors, the firms that choose high quality disclosure (e.g., a prestigious auditor) are, in equilibrium, those with favorable information about the firm's future and its growth opportunities (see Titman and Trueman 1986 for a formal model). This prediction implies *self-selection* by firms firm with limited financial resources but lucrative growth prospects. The prediction is supported by the results of Stocken (2000), who show that, if certain conditions are met, firms almost always have an incentive to reveal their private information to investors in a repeated game.

2.2 Empirical Strategy

As we mentioned in the introduction, we conduct a three-phase empirical investigation in order to study (a) whether the firms that resort to high quality disclosure are the ones who are more likely to grow at a rate that calls for using external finance and (b) what are the determinants of such an association, should it exist. The phases are as follows.

Phase One: Measuring Excess Growth

In the first phase, we estimate firms' dependence on external finance by using a financial planning model (see Higgins 1977, and Demirkgüç-Kunt and Maksimovic 1998, 2002). The model provides us with an off-the-shelf estimate for the excess growth made possible by external financing. We focus on the excess growth (rather than on the amount of external finance actually raised) to control for the endogeneity of firms' cash flow and investment and to adjust for the cases in which external finance is a substitute for internal finance (Demirkgüç-Kunt and Maksimovic 1998).

Under certain assumptions (see Higgins 1977, and Demirkgüç-Kunt and Maksimovic 1998, 2002), the financial planning model implies that the external financing need of firm *i* growing at g_i percent a year is given by

$$EFN_i = g_i * Assets_i - (1+g_i) * Earnings_i * b_i \quad (1)$$

where EFN_i is the external financing need and b_i is the proportion of earnings retained for reinvestment at time *t*.[1] The first term on the right hand side describes the required investment for a firm growing at g_i percent a year and the second term available capital for investment, taking the firm's retention ratio as given.

Setting $EFN_i = 0$, using the value of assets that are not financed by new short-term credit, i.e. 'long-term capital', $LTC_i = Assets_i * \left(1 - (Short\ term\ credit_i) / Assets_i\right)$, in equation (1) and solving for g_i we obtain the maximum short-term financed growth rate, SFG_i. It assumes that a firm reinvests all its earnings ($b_i = 1$) and uses some short-term credit. The formula for SFG_i is:

$$SFG_i = \frac{ROLTC_i}{1 - ROLTC_i} \quad (2)$$

where $ROLTC_i$ is return on long-term capital, defined as the ratio of earnings after interest and taxes to LTC_i. We use the realized ratio of short-term credit to assets at the beginning of the period when calculating SFG_i to ensure that the benchmark is feasible and does not assume a too costly level of short-term credit.

Our second benchmark for the rate of growth is the maximum sustainable growth rate, SG_i. It assumes that the firm does not pay dividends and that it obtains enough short-term and long-term credit to maintain a constant ratio of debt to equity. SG_i is calculated

1 The financial planning model relies on three assumptions about the link between the growth of a firm's sales and its investment. First, the ratio of assets used to achieve a given level of sales is constant;

by using the book value of equity in place of total assets ($Assets_i$) in equation (1) and then solving the equation for g_i :

$$SG_i = \frac{ROE_i}{1 - ROE_i} \tag{3}$$

where ROE_i is the ratio of earnings after interest and taxes to equity.

We use the *actual* sales growth of a firm to determine whether firm *i* grows during the year under question *faster* than predicted by the maximum short-term financed growth rate (SFG_i) or the maximum sustainable growth rate (SG_i). If it does, a dummy variable, $DSFG_i$ or DSG_i, describing excess growth, is set to 1; and if it does not, the dummy is set to zero.[2]

Phase Two: Identifying the Covariates of Excess Growth

The second phase of our three-phase empirical investigation consists of running Probit regressions of the form:

$$Excess\ growth_i = 1(X_i\beta + \varepsilon_i > 0) \tag{4}$$

where $Excess\ growth_i \in \{DSFG_i, DSG_i\}$, X_i is the set of covariates and ε_i is an independent centered normal error with unit variance. The covariate in X_i that is of most interest to us is, following Mitton (2002), an indicator of the quality of disclosure that equals one if the firm uses one of the prestigious 'Big Five' (Arthur Andersen, Deloitte & Touche, Ernst & Young, KPMG and PriceWaterhouseCoopers) international accounting firms as

second, the earnings on marginal sales are the same as those on average sales; and third, the reported depreciation of assets equals the economic depreciation.

[2] In a cross-sectional analysis in which technological advances are not likely to play a major role, the estimates of the maximum attainable growth rates derived using the percentages of sales approach are conservative in two ways. First, they are based on the assumption that a firm uses the unconstrained sources of finance no more intensively than it is currently doing. Second, it is implicitly assumed that firms do not systematically grow on the basis of spare capacity. To the extent that the two assumptions do not hold, the model underestimates the maximum growth rate attainable using the unconstrained sources of finance (Demirkgüç-Kunt and Maksimovic 1998, 2002). It is important to keep the assumptions in mind when interpreting the results.

its auditor. We discuss the pros and cons of the indicator and the other determinants of excess growth in greater detail in section 3.3.

Standard textbook considerations about asymmetric information, adverse selection and moral hazard suggest that the marginal cost of external financing is an increasing function of the amount of external finance raised. The idea is that in the presence of capital market imperfections, firms' increased use of external financing eventually pushes the marginal cost of capital upwards. In perfect capital markets, that would not happen. High quality disclosure might therefore be especially important for a firm that relies on external financing a lot, suggesting that $DSFG_i$ and DSG_i are not necessarily measuring the same thing. We expect that the effects of disclosure quality are stronger on DSG_i than on $DSFG_i$, because for firm *i*, the difference between DSG_i and $DSFG_i$ can be attributed to variation in the extent to which the firm has to go to the capital markets to finance its growth but not to variation in the rate of sales growth.

Phase Three: Testing a Joint Hypothesis

In the third phase, we try to uncover the reason for the association between the excess growth and the indicator of the quality of disclosure. We examine in particular the hypothesis that within a group of observationally identical firms, a firm with more favorable private information about its growth options chooses a high quality auditor. The firm has an incentive to do so because the firm's expected loss from not doing so (i.e., from not being able to grow at a rate that requires external finance) is greater than for a firm with less favorable information (Titman and Trueman 1986). This *self-selection* argument suggests that firms that have a comparative advantage with becoming more transparent in the market for long-term capital will be the ones using the high quality auditors and will benefit more from their services than would a randomly selected firm with the same characteristics. These considerations imply, in essence, a joint hypothesis that the excess growth correlates with the indicator because financially constrained firms with favorable growth

prospects choose high-quality auditors (self-select) and because their use enhances the availability of external finance.

In their recent study, Chiappori and Salanié (2000) developed a method for testing the presence of such self-selection under asymmetric information on insurance markets. We apply their method to our data to test the joint hypothesis. In our case, the method amounts to evaluating whether there exists a positive correlation between *conditional* laws governing the use of high quality auditor ('the purchase of an insurance contract') and the ability to exploit growth opportunities using external finance ('the occurrence of an accident'). The use of high quality auditors provides no additional information ('no self-selection') if and only if the prediction of the excess growth based on observable firm characteristics *and* use of high quality auditors coincides with the prediction based on the observable firm characteristics alone (see also Dionne, Gouriéroux and Vanasse 2001). If the prediction does not improve, we cannot reject the conditional independence of the use of high quality auditors and excess growth. If the prediction improves, we reject the conditional independence.

To test for the conditional independence, we use two of the three tests developed in Chiappori and Salanié (2000, pp. 66-67). The first test (CS1) consists of estimating two separate Probit models, one for the use of auditor and one for the excess growth, and then computing a test statistic based on the generalized residuals from the models. Under the null of conditional independence, the statistic is asymptotically distributed as a $\chi^2(1)$ and the correlation between the residuals should be zero. The second test (CS2) estimates a bivariate Probit for the same two models to get an efficient estimate of the correlation coefficient, ρ, of the error terms. Under the null hypothesis of conditional independence, $\rho = 0$.

Anticipating, we reject the conditional independence. We therefore have to ask why it is rejected. We consider several alternative interpretations for this empirical finding: We examine, for example, whether the association between the excess growth and the indica-

tor of the quality of disclosure is stronger for *a priori* financially constrained firms. If it were, it would, due to the fact that excess growth can *only* be achieved by raising external finance, support the view that the reason for self-selection is that firms choose high quality disclosure because they expect that it can relax financial constraints. We also consider whether omitted variables (other than unobserved financial constraints) might be driving the association and the rejection.

The empirical implementation of the three phases is described in detail after the next section, which describes the data.

3. Description of Sample and Variables

3.1 Description of Sample

The data that we use comes from a database compiled by Balance Consulting Ltd, a commercial vendor of financial data. The database consists of adjusted financial statements of over 5,000 Finnish companies for both publicly traded and private firms. Firms from all the main sectors are represented in the database. In addition to financial items, the database includes other information, such as the name of a firm's CEO, the names of the members in a firm's board of directors, an indicator of whether a firm belongs to a group (concern), a firm's auditor(s), and the founding year of a firm. We have augmented the financial statements data by identifying the firms that are listed on the Helsinki Stock Exchange (HEX) and that have in recent past (i.e., between 1996-1998) received venture capital finance. The sources of these data are the HEX Information Services' and the Finnish Venture Capital Association's publications.

Because we need data on sales growth, our sample combines two cross-sections that are from 1997 and 1998. Firms were excluded from the sample if there were no sales data both for 1997 and 1998, or if some of the key financial items required to calculate the maximum attainable growth rates was not available. We also excluded firms that are subsidiaries, as defined by the Finnish law, of either a Finnish or foreign firm. Finally, for a

number of firms, the founding year was not available. Such firms were excluded, because the age of a firm is considered one of the most important controls for firms' creditworthiness and opacity in the previous literature. These exclusions reduced the size of our sample quite dramatically, to 1549 firms.

3.2 Dependent Variables

We first compute for each firm *i* the rate of sales growth from 1997 to 1998. We then compute the maximum attainable growth rates as defined above using the financial statements data at the end of 1997, subtract them from the rate of sales growth and generate the dummy variables $DSFG_i$ and DSG_i.

We focus on the dichotomous indicators of excess growth for three reasons. First, our main interest is in the 'qualitative' effects of disclosure quality and not whether it explains cross-sectional variation in the amount of excess growth. Second, although firms' (sales) growth is potentially a volatile time-series, dependence on external finance, as measured by excess growth, may be a more persistent firm characteristic. The dichotomous indicators are supposed to capture the persistence, because they are based on a relative measure (on a difference) and because they might be less volatile over time than the amount of excess growth. Finally, the tests developed by Chiappori and Salanié (2000) that we will apply rely on the dichotomy of the indicators.

3.3 Explanatory Variables

As we mentioned earlier, we follow Mitton (2002) and use as our primary indicator of a firm's disclosure quality is the dummy variable that is set to 1 if the firm is audited by one of the Big Five international accounting firms, and to 0 otherwise. The dummy, called $AUDIT_i$, is a proxy for transparency, because the purchase of auditing services from these internationally recognizable auditing firms with strong reputation indicates that the firm has opted for a high standard of disclosure (see also Titman and Trueman 1986). The better the reputation and the wealthier the auditor, the more it risks if the quality of its audit-

ing is not up to the best practice (Dye 1993). As Mitton (2002) notes, the internationally active auditors are also more likely to detect mistakes in a firm's financial reporting because they are more independent than local firms.

As another indicator of disclosure quality, Mitton (2002) uses a dummy variable that was set to 1 if the firm in his sample had an American depository receipt (ADR) listed in the US. Because our data set includes both public and private firms, we can construct a similar dummy variable. The dummy variable, $NOTPUBLIC_i$, is set to 1 if the firm is not publicly listed and zero otherwise. Because the private firms are *not* subject to as demanding disclosure requirements and as close scrutiny by the investors and supervisors as the listed firms, the variable could be negatively correlated with disclosure quality. However, $NOTPUBLIC_i$ may also reflect (other) capital market services made available by the stock market listing. Thus, even though a negative coefficient of $NOTPUBLIC_i$ would be consistent with the disclosure interpretation, we regard it only as a control variable.

We also use several other variables in the regressions to control for firm-specific determinants of excess growth. They include firm age (AGE_i = the age of firm in years) and size ($ASSETS_i$ = book value of assets, measured at the end of 1997), which are perhaps the two most commonly used controls for the availability of external finance and firms' growth prospects in the previous literature. Two other important controls are the amount of tangible ($FIXEDAS_i$ = the ratio of tangible assets to assets) and liquid assets ($LIQUIDAS_i$ = the ratio of cash and financial securities to the non-liquid assets, i.e., to total assets minus cash and financial securities), both measured at the end of 1997. The former measures the availability of assets that can be pledged as collateral while the latter controls for the possibility that some firms accumulate liquid assets to smooth their investments over time. In addition, we account for the underlying profitability of firms' operations ($PROFIT_i$ = the ratio of earnings before interest, taxes, depreciation and amorti-

zation to sales) and for the asset turnover of the firm ($ASTURN_i$ = the ratio of sales to assets), both measured at the end of 1997. We expect these controls to obtain negative coefficients because they should correlate positively with the availability of internal finance and efficiency in the use of assets, respectively.

Because agency problems may reduce firms ability to grow using external finance, we control for the effects of a firm's internal corporate governance system. To this end, we include board size ($BOARD_i$ = the number of board members), because in large boards, the individual members of the board are less likely to monitor and control the actions of the CEO. We also include a dummy that is set to 1 if the CEO is the chairman of the board ($CEOCHAIR_i$) as well as a dummy that is set to 1 if the CEO is the chairman of the board in a firm having a board larger than the median (average) board in the sample ($CEOCHAIRL_i$).

Following a bulk of previous studies, we also include dummy variables for a firm's industry (coefficients not reported) to control for the possibility that investment opportunities depend on the industry of firms. Because the recent literature also suggests that venture-backed firms are growth-oriented, a dummy indicating whether a firm has in recent past received venture capital finance (VCF_i) is included to account for the special nature of such venture-backed firms. Finally, a dummy indicating whether a firm is a parent company in a group ($GROUP_i$) is included. If there are no benefits of internal capital markets (or 'cross-subsidization'), the coefficient for this term should be zero. The dummy may proxy the diversification of a firm, too.

3.4 Summary Statistics

Table 1 summarizes some main characteristics of the sample. The table shows among many other things that the size of the firms as measured by $ASSETS_i$ varies from 0.6 to over 7,019.8 million euros and that firms' age, as measured by AGE_i, ranges from 2 to

nearly 350 years. Median $ASSETS_i$ is however only 4.49 million euros. What the table also shows is that 55 percent of the firms have as their auditor one of the Big Five auditing firms and that around 4 percent of the firms are listed on the stock market. We conclude that the firms in our data are mostly private and small.

[INSERT TABLE 1 HERE]

4. Empirical Results

4.1 Phase One: Measuring Excess Growth

Table 2 presents the proportion of firms whose annual sales growth rate exceeds the two maximum attainable growth rates. The table shows that 37 (29) percent of the firms have grown faster than the maximum short-term financed growth rate (the maximum sustainable growth rate). We also find that the firms audited by the Big Five are more likely than their counterparts to grow at a rate that exceeds the maximum attainable growth rates (though not shown in the table, the differences are statistically significant at the 5% level). The table also shows that it is important to control for firm characteristics in the subsequent empirical analysis, as the maximum attainable growth rates vary systematically between publicly listed and private firms, and with firm's size, age and industry.

[INSERT TABLE 2 HERE]

Table 3 displays the pairwise correlations between the dependent and selected explanatory variables. The table shows that $DSFG_i$ and DSG_i are positively correlated with $AUDIT_i$ and negatively with $NOTPUBLIC_i$. As expected, $AUDIT_i$ and $NOTPUBLIC_i$ are negatively correlated, lending further credence to the interpretation of our indicator.

[INSERT TABLE 3 HERE]

The pairwise correlations must be interpreted with caution, as $AUDIT_i$ is for example correlated with AGE_i and $ASSETS_i$, and they are all positively correlated with $DSFG_i$ and DSG_i. Does $AUDIT_i$ have a separate identifiable association with $DSFG_i$

and DSG_i when included in a regression equation with the control variables? To address the question we go on to the phase two of our empirical analysis.

4.2 Phase Two: Identifying the Covariates of Excess Growth

Table 4 reports the results of Probit regressions. They are displayed separately for DSG_i (Panel A) and $DSFG_i$ (Panel B) using six different specifications and a common sample of 1405 firms for which all the control variables are available.

Panel A of the table shows that the coefficient of $AUDIT_i$ is positive and statistically significant at the 5 percent level. The result supports the view that the probability of a firm growing at a rate requiring external finance is higher for firms audited by high quality auditors. We also find that the control variables obtain the expected signs. The coefficients of $NOTPUBLIC_i$, $PROFIT_i$, $ASTURN_i$ and $LIQUIDAS_i$ are, for example, negative at the 5 percent significance level. We do not identify any effects of $ASSETS_i$ and AGE_i on the excess growth once the other firm characteristics are controlled for. Of special interest is the finding that $CEOCHAIRL_i$ has a statistically significant negative effect on DSG_i. Turning then to Panel B, we find that the coefficient of $AUDIT_i$ does *not* become significant. Interestingly, besides the same variables that had an effect on DSG_i, $BOARD_i$ has a positive and significant effect on $DSFG_i$.

Taken together, the results of Probit regressions support the view that the better the quality of a firm's disclosure, the more likely that the firm grows at a rate requiring external finance.[3] That there is a positive association between DSG_i and $AUDIT_i$ but not between $DSFG_i$ and $AUDIT_i$, was expected and limits the range of alternative interpreta-

[3] If truly exogenous, would the estimated effect of $AUDIT_i$ be large enough to make a difference for firms whose growth depends on the availability of external finance? We can address the question by computing its marginal effect, i.e., the implied effect of a unit change in the regressor. When computed at the mean values of the regressors using specification (4) in Panel A of Table 4, the implied slope (and *t*-statistic) for $AUDIT_i$ is 5% (1.97). Because the mean of DSG_i is 29%, the effect is not negligible.

tions for the result (see also Appendix 1 where we present some additional tests to evaluate the robustness of these results): It seems that the association is related to firms' need to grow using long-term external finance.

[INSERT TABLE 4 HERE]

We can, in fact, limit the range of alternative interpretations for the relation also by using two direct measures of the use of external finance. We use the two measures considered by Demirkgüç-Kunt and Maksimovic (1998, p. 2121-2122), which are the proportions of increases in total assets financed by long-term debt and newly issued shares. Using data from 1998 and the measures allows us to check whether firms for which DSG_i=1 increased more their debt and issued more equity than firms for which DSG_i=0 during the year. What we find is that the difference in raising debt is statistically significant at the 5% level (when using a one-sided *t*-test with unequal variances) but that the difference in equity issuance, albeit positive, is not.

If it only were that simple. In the next two sections we take seriously the possibility that at least a part of the documented association between the excess growth and the use of prestigious auditors is due to factors other than the conventional view that external auditors can enhance the availability of external finance to firms. The conventional wisdom is that they can do so because they "guarantee" the quality or creditability of information that the firms disclose to the market.

4.3 Phase Three: Testing the Joint Hypothesis

As we explained in section 2.2, one plausible explanation for the positive coefficient of $AUDIT_i$ is that firms self-select, i.e., that the internationally recognized auditors are chosen by the firms that due to asymmetric information and other capital market imperfections would face a higher likelihood of not being able to grow at a rate requiring external

finance. In what follows we try to test for such selection (conditional independence of DSG_i and $AUDIT_i$) by using the two tests (CS1 and CS2) developed in Chiappori and Salanié (2000). Recall that an interpretation of these tests is that they allow us to evaluate the joint hypothesis implied by the model of Titman and Trueman (1986) that the excess growth correlates with the indicator because financially constrained firms with favorable growth prospects choose high-quality auditors (self-select) and because their use enhances the availability of external finance.

We experiment with four different pairs of Probit equations for DSG_i and $AUDIT_i$ when applying the CS1 and CS2 tests to our data. First, we use all the control variables that were included in specification (5) of Table 4 (but excluding, of course, $AUDIT_i$ from both equations). Second, we add to these specifications three new variables: the ratio of dividends to sales, the equity multiplier and the level of a firm's sales. The first two of the variables control, at least potentially, for financial constraints and some other means that firms can use to signal their quality (see for example Titman and Trueman 1986, p. 171). The inclusion of the level of sales is motivated by the high fixed costs of employing a high quality auditor. Third, we use the specification (5) of Panel A of Table 4 for DSG_i, but trim the estimating equation of $AUDIT_i$ to include only non-financial variables ($NOTPUBLIC_i$, AGE_i, $BOARD_i$, $CEOCHAIR_i$, $CEOCHAIRL_i$, $GROUP_i$) and the level of sales. Finally, because Chiappori and Salanié (2000) argue that it may be important to focus on relatively homogenous populations, we divide the data on large and small firms according to $ASSETS_i$. The criterion of the division is the median of $ASSETS_i$. In these estimations, we again use the specification (5) of Table 4 (as above) for both DSG_i and $AUDIT_i$.[4]

[4] We are forced to exclude $NOTPUBLIC_i$ and VCF_i from the equations, in the sub-sample of small firms, they would have predicted the dependent variable perfectly. Note that all estimations include industry

The results are displayed in Table 5, where the numbering of the columns refers to the four different specifications of the Probit -pairs. Considering the first Probit pair for DSG_i and $AUDIT_i$ (column 1), we get a value of 3.75 for CS1. The computed *p*-value is 5.36 percent, implying that we marginally fail to reject conditional independence at the 5 percent level. The same conclusion follows from CS2; the estimated ρ is positive, at 0.093, but it is marginally not significant at the 5 percent level. However, the test results displayed in columns (2) and (3) suggest the opposite. These results imply that we can reject at the 5 percent significance level the null hypothesis of conditional independence. Finally, columns (4a) and (4b) report the results for small and large firms, respectively. The results suggest that we can reject the null hypothesis for the small firms but not necessarily for the large firms. Thus, it seems that firms, especially the smaller ones, with favorable private information about their growth opportunities (and limited internal resources) have an incentive to self-select, i.e., to buy 'an insurance' against the risk of not being able to raise external finance. This finding is consistent with the predictions of the model of Titman and Trueman (1986).

[INSERT TABLE 5 HERE]

The important implication of the above analysis is that it explains, at least in partly, why we found a positive association between the excess growth and the indicator of the use of high quality auditor. But why did we reject the conditional independence? Could "unobserved" financial constrains drive the positive association and the rejection? What alternative explanations are there for our findings? Could it be that expected excess growth leads

dummies. However, we had to rely on somewhat more crude industry classifications to avoid making Probits not estimable when using the sub-samples.

a firm to choose a prestigious accounting firm? These are the questions we address in the next section.

4.4 Phase Three: Evaluation and Discussion

A Priori Financially Constrained vs. Unconstrained Firms

Perhaps the most obvious possibility, as also suggested by the model of Titman and Trueman (1986), is that unobservable financial constraints are driving the association and thus the rejection. To analyze this possibility, we study whether the association of disclosure quality with DSG_i differs between firms for which, *a priori*, financial constrains are binding and firms for which they are not. If raising outside finance is easier with better disclosure quality and if firms with limited financial resources but lucrative growth prospects therefore choose a high quality auditor, we should find that the coefficients of $AUDIT_i$ is significant in explaining the excess growth of the *a priori* financially constrained firms but not necessarily that of the unconstrained firms.

There are several possible ways to group firms according to *a priori* differences in information costs (Hubbard 1998). We follow the received literature and classify the sample firms on the basis of i) a firm's dividend payout (Fazzari, Hubbard and Petersen 1988),[5] ii) whether the firm is a member of an industrial group or not (Hoshi, Kashyap and Scharfstein 1991) as well as iii) the firm's initial level of leverage at the beginning of the period (Whited 1992). These choices can be motivated as follows. Firms suffering from financial constraints, such as an adverse selection problem with new equity issue, would not pay substantial dividends in the presence of an expected external financing need. Similarly, capital market imperfections may hit less hard group firms because they have access to internal capital markets of the group. We think, in particular, that a parent company

should have relatively strong discretion over the allocation of its group's financial resources. Finally, the firms that have a high level of leverage may have less unused debt capacity and, in addition, higher risk of default. They may therefore be financially constrained and benefit more from the high quality of disclosure.

Our empirical criterion for not paying substantial dividends is that a firm's dividend payout relative to its sales in 1997 was lower than the median of the ratio among the sample of firms used in the estimations (median = 0.76%). We use $GROUP_i$ to classify firms on the basis of their membership in groups. Finally, the criterion for being 'highly leveraged' at the outset is that the firm has an equity multiplier, i.e., the ratio of assets to equity capital that was in 1997 higher than the median of the ratio in the estimating sample (median = 3.11).[6]

Using the three *a priori* classifications of firms, we re-estimate specification (4) in Panel A of Table 4 for DSG_i. The results are presented in Table 6. They reveal that $AUDIT_i$ has a significant and positive association with DSG_i within the group of the *a priori* financially constrained firms but not in the other group.[7] This finding provides support for the view that unobservable financial constraints may indeed be driving the association between the excess growth and the indicator of disclosure quality and thus also the rejection of conditional independence.

[5] Grouping firms by dividend payouts have revealed that, consistent with the hypothesis of capital market imperfections, the sensitivity of investment to internal funds is a feature of firms with low or zero dividend (se Hubbard 1998 and the references therein).

[6] Note that the first and last of these variables are based on the same variables that were used as additional controls in the CS1 and CS2 tests of the previous subsection.

[7] We are not able to report the coefficient of $NOTPUBLIC_i$ for firms that are not parent companies, because there are only two firms that are listed on the stock exchange and that are not parent companies. Because of this lack of data, the Probit model was not estimable. We have estimated the specification with and without the publicly listed firms, but found basically no differences in the results. The reported results are for the sample including the listed firms.

[INSERT TABLE 6 HERE]

Omitted Variables

Again, one can just wish that it were that simple. An alternative interpretation of the foregoing result is that we have demonstrated nothing but an omitted variables problem. That is to say, we also have to consider whether omitted variables (other than (basically unobserved) financial constraints) might be driving the association and the rejection.

We think that there are five obvious possibilities. The first one is that $AUDIT_i$ captures a firm's orientation towards international markets. A firm with significant foreign sales (exports) may benefit from having an internationally recognized auditor and have better access to capital markets. To test for this possibility, we add the ratio of a firm's foreign sales to its total sales, measured in 1997, into the regressions reported in Table 4. Somewhat surprisingly, the variable receives a negative coefficient that depending on specification is (and is not) significant at the 5 percent level. However, the positive association of $AUDIT_i$ with DSG_i remain intact. Moreover, when we include the variable in the specifications used in the Chiappori-Salanié tests and repeat the tests, the results do not change.[8]

The second potentially important but omitted variable is the ownership structure of firms. Because we do not have ownership data, we cannot empirically evaluate its impact on the results. However, there are arguments suggesting that our results should be quite robust to the inclusion of an ownership variable. First, to control for one particular source

[8] The ratio of foreign sales to total sales receives a positive and highly significant coefficient in the Probit regressions on $AUDIT_i$. However, the results for tests of asymmetric information do not change. In fact, we can now reject the null of hypothesis at marginally better levels of significance. For the same pairs of Probit models as reported in Table 6, the CS1 and CS2 tests are as follows: For CS1: 1) 4.69 (0.03), 2) 6.95 (0.01), 3) 6.23 (0.01), 4a) 7.75 (0.01), and 4b) 1.71 (0.19), where the first number refers to the value of the statistic and the second one in the parenthesis to *p*-value; for CS2: 1) 0.11 (0.04), 2) 0.13 (0.01), 3) 0.12 (0.02), 4a) 0.20 (0.01), and 4b) 0.09 (0.21), where the first number is the estimated ρ and the second one *p*-value.

of heterogeneity due to ownership structures, we have already at the outset excluded subsidiaries, including those of the Finnish and foreign-owned firms, from the data. Second, we have some indirect (but of course imperfect) controls for the ownership structure in the regressions. To the extent that ownership structures vary systematically between public and private firms, and with the age of the firm, its size and across industries, $NOTPUBLIC_i$, AGE_i, $ASSETS_i$ and the industry dummies should capture the effects. Should the board size of a firm correlate with the dispersion of the firm's ownership, the effects are controlled by $BOARD_i$. Third, if international portfolio investors are more likely to invest in firms operating internationally, then the ratio of foreign sales to total sales may be a useful proxy for foreign ownership of this type. To control for such foreign ownership is important, as the foreign-owned firms may opt for a higher disclosure standard due to the foreign investors preferring internationally recognized auditors to local ones. The firms may also have better access to the market for long-term capital for reasons related to the identity of the owners and not related to the use of a high quality auditor per se. To the extent that the foreign sales variable controls for the effects of this type of ownership, our regression results are robust (as just shown).

Ownership concentration may be important, because it is a substitute for weak legal protection and has therefore a link to the availability of external finance (La Porta et al. 1998). In Finland, the overall level of minority protection was in the early 1990s at an intermediate level by international standards (La Porta et al., 1997). It has however improved since then, particularly due to a reform of the Finnish company law that became effective as of the beginning of 1997 (for a more detailed account of these developments, see Hyytinen et al. 2003). This suggests that ownership as a determinant of external finance may have become less important than it has traditionally been. Moreover, because we use only Finnish data, cross-firm differences cannot be driven by any country specific

patterns of ownership. However, we acknowledge that the possibility remains that unobserved ownership structures can play a role in the analysis.

The third potentially important but omitted variable is the amount of consulting (as opposed to auditing) provided by the auditors. The Big Five may provide more such services and the quality of their services could be better than that of the other auditors. If high quality consulting enhances firm growth, a spurious association might arise. The extent to which this is of concern to us depends, however, on the extent to which the consulting provided by the auditors is related to finance. To the extent that it is not, firms still have to be able to raise external finance in order to finance their growth, in which case our analysis remains valid. If the consulting provided by the Big Five is related to finance, we cannot exclude the possibility that unobserved financial consulting explains our findings. However, given that the financial consulting is most likely about signaling the quality of a firm to investors (and this is what the model of Titman and Trueman (1986) basically suggests) the main message of our analysis is preserved even if the two effects jointly accounted for our findings.

The fourth potentially important but omitted variable is firm-investor relationships; such relationships (and monitoring by financial intermediaries) can be immensely important for private firms' access to external finance (Petersen and Rajan 1994, Berger and Udell 1995, Boot 2000). One might therefore cast doubt on the importance of disclosure quality. However, if the relationships and monitoring are, as the received literature suggests, means to produce information about the quality of firms, they could well be substitutes to disclosure quality (see Boot and Thakor 2001). This view suggests a negative correlation between $AUDIT_i$ and an unobserved relationships variable. Given that firms with close relationships to financial institutions should have easy access to external finance, we would expect a *negative* coefficient for $AUDIT_i$ if an omitted relationships variable were driving its association with the excess growth. This pattern runs counter what we have found.

Finally, omitted non-linearities might be driving our results. However, when we include sales, the ratio of foreign sales to the total sales, and the squares of these two variables plus the square of the total assets in specification 5 of Table 4, our basic result for $AUDIT_i$ does not change. Its coefficient is still positive at better than the 5% significance level. As another specification test, we apply the procedure suggested by Dionne et al. (2001). Applying the idea amounts to running a Probit on $AUDIT_i$, and then introducing the estimated expected probability of using a high quality auditor ($\hat{E}(AUDIT / X)$), in the right-hand side of the Probit equation for DSG_i together with $AUDIT_i$. As $\hat{E}(AUDIT / X)$ is by construction a non-linear function of the observables, the procedure can be interpreted as a specification test. We use specification (4) in Panel A of Table 4 for DSG_i, and the controls from this specification when running the Probit for $AUDIT_i$. When we add $\hat{E}(AUDIT / X)$ into the model for DSG_i, the coefficient of $AUDIT_i$ does not change. Specifically, it is 0.16, and has an unadjusted standard error of 0.079.[9] The $\hat{E}(AUDIT / X)$ variable obtains a negative but non-significant coefficient. We conclude that omitted non-linearities are not driving the association between $AUDIT_i$ with DSG_i (see also the results of the robustness analysis presented in the Appendix).

Testing Directly for the Exogeneity of AUDIT$_i$

If omitted variables or omitted non-linearities are not driving our results, what, then, is? As we see it, the foregoing empirical results - the rejection of the conditional dependence and the finding that the association is stronger for firms that are *a priori* financially constrained in particular - support the (joint) hypothesis, put forward by the model of Titman

[9] Even though the second-step regression contains an approximated regressor, a two step-procedure yields consistent estimates of the coefficients. The second-step standard errors should be adjusted, but at least in Dionne et al. (2001), the difference turned out to be small (cf. Dionne et al. 2001, footnote 1). While we have not done the adjustment, we have run a linear probability model that sometimes performs better in the presence of a potentially endogenous dummy variable in the equation. This procedure yielded similar results: the coefficient of $AUDIT_i$ and the predictors remain the same.

and Trueman (1986), that the excess growth correlates with the indicator because financially constrained firms with favorable growth prospects choose high-quality auditors (self-select) *and* because their use enhances the availability of external finance. This view suggests that excess growth and the use of high quality auditors are jointly determined. Indeed, when we test directly for the exogeneity of $AUDIT_i$ using the method of Rivers and Vuong (1988), we find some, but not conclusive, evidence against the exogeneity. When we test the exogeneity of $AUDIT_i$ in specification 5 of Table 4, we can reject the null hypothesis (of exogeneity) at better than the 1% level. However, when we add to this specification the sales of firms, the ratio of foreign sales to the total sales, and the squares of these two variables plus the square of the total assets to account for potential non-linearities, the *p*-value of the test is 7%.[10,11]

On the face of it, it may seem unexpected that this evidence is not conclusive. It is not, however, unexpected, because if the second part of the joint hypothesis did not hold, firms with limited financial resources but favorable growth prospects would not, in equilibrium, find it feasible to choose a high quality auditor. But this then raises the question, how much does the use of a high-quality auditor enhance the availability of external finance once the effects of self-selection are controlled for? To address the question, we should formulate a simultaneous model with two endogenous dichotomous variables. While *testing* for the exogeneity in the case where the Probit model contains a binary explanatory variable is easy, *estimating* such a two equation model is not a trivial exercise (Wooldridge 2002). Moreover, because the model's logical consistency, or coherency, is an issue (Blundell and Smith 1994), specifying the two-equation binary model requires

[10] Finding good instrumental variables for the test is challenging. We have used as instruments for the auditor variable three thresholds (all related to firm size) that arise because the Finnish auditing law requires that firms whose size exceeds certain size thresholds have to use an "officially accepted auditor". The three thresholds are jointly highly significant in the estimating equation of $AUDIT_i$. All the other explanatory variables in the estimating equation are the same as those included in the estimating equation of DSG_i.

additional assumptions and instrumental variables that are best addressed and found in future work.

5. Conclusions

In this paper we address a number important questions of our times: Are firms that resort to better quality disclosure the ones who raise external finance and grow therefore faster? If yes, what does explain this relation? Could it be that firms with limited financial resources but lucrative growth prospects choose high quality disclosure even in the absence of legal provisions to force truthful reporting? To address the questions, we pursue a three-phase empirical strategy. In the first phase, we estimate the excess growth made possible by external finance. We then show in the second phase that the excess growth is associated with high quality disclosure. Finally, in the third phase, we provide evidence for self-selection. We also find that the association is stronger for firms that are *a priori* financially constrained and that excess growth and the use of high quality auditors may be jointly determined.

We acknowledge that interpreting reduced-form coefficients is not easy, and that our analysis is no exception. Our favorable interpretation of these findings is, however, that firms with favorable private information about their growth opportunities and limited internal resources have an incentive to self-select, i.e., 'buy insurance' through disclosure quality against the risk of not being able to raise external finance. The interpretation is consistent with the predictions of the model analyzed by Titman and Trueman (1986). It also points toward the possibility that firms choose high quality disclosure even in the absence of legal provisions to force truthful reporting.

We firmly believe that the results of our three-phase empirical analysis raises a number of new research questions, not least because the results support self-selection by

[11] In additional unreported experiments, the null hypothesis of exogeneity was rejected in some cases, but not in others. Taken together, our tests for the exogeneity are not conclusive.

financially constrained firms and identify hence a specific mechanism through which firms at least *try to* reduce barriers to external finance. But which way does the causality primarily go? How much does the use of a high-quality auditor enhance the availability of external finance once the effects of self-selection are controlled for? Our analysis suggests that these are questions on which future empirical work should focus.

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Appendix: Robustness Tests

In this Appendix, we present some additional tests to evaluate the robustness of the results that we have reported in Panel A in Table 4. As a first test, we dropped first some and then all of the insignificant regressors from the equations. The exclusions did not change the results. The remaining robustness tests consisted of i) re-estimating the reported specifications with redefined AGE_i and $ASSETS_i$ to allow for the often postulated decreasing marginal effect of firm age and size on the availability of external finance (see, e.g., Petersen and Rajan 1994), and ii) repeating the estimations with a trimmed data set from which extreme observations are dropped.

A firm's ability to raise long-term finance need not increase linearly with its age, as the effect of an additional year of existence may decline with it. A similar consideration applies to the size of the firm. To test for such nonlinear relations, we replaced AGE_i with the log of AGE_i and $ASSETS_i$ with the log of the $ASSETS_i$, and re-estimated the specification (4) of Panel A in Table 4. The redefined control variables did not gain significant coefficients and the results remained intact. We also included the redefined variables one at the time, but identified no significant changes. Finally, we were not able to identify any changes in the results when we included squared AGE_i and $ASSETS_i$ in the models.

We also checked the consistency of the results by performing three outlier tests. The aim of these tests was to exclude obvious outliers in the data. In the first test, we dropped all the firms that are older than 150 years. The exclusion reduced the sample size by nine observations, but the results remained unaffected. In the second test, we droped the firms with the book value of assets larger than 1000 million euros. The restriction dropped eight firms from the analysis, but the results remained unaffected. Finally, we excluded the 148 firms that were not profitable in 1997. Using the trimmed sample, the coefficient of $AUDIT_i$ reduced to 0.041 but remained significant at the 10% level.

Table 1 Descriptive Statistics for Explanatory Variables

	Obs	Mean	Median	Std. Dev.	Minimum	Maximum
ASSETS, mill. euros	1549	32.74	4.49	208.76	0.22	7 019.83
ASTURN	1549	2.34	1.84	2.10	0.04	40.90
FIXEDAS	1546	0.30	0.26	0.22	0.00	0.95
LIQUIDAS	1549	0.20	0.10	0.36	0.00	5.93
PROFIT	1548	0.11	0.09	0.10	-0.17	0.82
AGE (in years)	1549	35	22	34	2	349
BOARD	1493	4	4	2	1	12
AUDIT	1549	0.55	1	0.50	0	1
NOTPUBLIC	1549	0.96	1	0.19	0	1
CEOCHAIR	1410	0.26	0	0.44	0	1
CEOCHAIRL	1410	0.07	0	0.25	0	1
GROUP	1549	0.27	0	0.44	0	1
VCF	1549	0.02	0	0.13	0	1

Note: Sample mean, median, standard deviation, minimum and maximum of selected explanatory variables. The sample is drawn from Balance Consulting Ltd's data and augmented using data from the Helsinki Stock Exchange Group's and the Finnish Venture Capital Association's publications. ASSETS = book value of total assets, ASTURN = ratio of ASSETS to firm's sales, FIXEDAS = ratio of tangible assets to ASSETS, LIQUIDAS = cash plus financial securities to non-liquid assets, PROFIT = ratio of earnings before interest, taxes, depreciation and amortization to sales, AGE = age of firm in years, BOARD = number of board members, AUDIT = dummy set to 1 for firms employing a high quality auditor ('Big Five'), NOTPUBLIC = dummy set to 1 for non-listed (private) firms, CEOCHAIR = dummy set to 1 for firms in which CEO holds the chair of the board of directors, CEOCHAIRL = dummy set to 1 for firms in which CEO holds the chair of the board of directors and the size of the board is larger than the median board in the sample, GROUP = dummy set to 1 for firms that are a parent company in a group (concern), VCF = dummy set to 1 for firms that have received venture capital finance in recent past.

Table 2 Proportion of Firms Growing at a Rate Requiring External Finance

	Number of obs.	Proportion of firms that exceed their max. short-term financed growth rate	Proportion of firms that exceed their maximum sustainable growth rate
Sample total	1549	37 %	29 %
AUDIT = 1	844	40 %	33 %
AUDIT = 0	705	34 %	25 %
NOTPUBLIC = 1	1494	36 %	28 %
NOTPUBLIC = 0	55	56 %	53 %
Old companies	790	41 %	33 %
Young companies	759	33 %	26 %
Large companies	775	41 %	31 %
Small companies	774	33 %	28 %
Manufacturing firms	535	34 %	27 %
Food & beverages (SIC 15-16)	83	29 %	29 %
Textiles, etc. (SIC 17-19)	36	25 %	22 %
Wood, pulp & paper (SIC 20-21)	72	33 %	32 %
Chemicals (SIC 23-25)	38	32 %	16 %
Metals & eng. (SIC 27-29,34-35)	157	37 %	27 %
Electrical eng. (SIC 30-33)	57	33 %	25 %
Other manufacturing	92	41 %	28 %
Energy & water supply and construction (SIC 40-45)	139	47 %	40 %
Trade (SIC 50-52)	546	34 %	26 %
Other industries (SIC 60-99)	329	43 %	35 %

Note: The sample is drawn from Balance Consulting Ltd's data and augmented using data from the HEX Information Services' and the Finnish Venture Capital Association's publications. Proportion of firms that exceed i) maximum short-term financed growth rate = average of DSFG, ii) maximum sustainable growth rate = average of DSG, where DSFG and DSG are the dummy variables indicating excess growth, as defined in the main text. 'AUDIT = dummy set to 1 for firms employing a high quality auditor ('Big Five'), NOT-PUBLIC = dummy set to 1 for non-listed (private) firms, 'Old companies' = firms older than the median AGE, 'Large companies' = firms with ASSETS larger than the median of ASSETS.

Table 3 Correlation matrix of Selected Variables

	DSFG	DSG	ASSETS	ASTURN	FIXEDAS	LIQUIDAS
DSFG	1.00					
DSG	0.63	1.00				
	(0.00)					
ASSETS	0.06	0.05	1.00			
	(0.03)	(0.05)				
ASTURN	-0.13	-0.11	-0.08	1.00		
	(0.00)	(0.00)	(0.00)			
FIXEDAS	0.10	0.03	0.07	-0.13	1.00	
	(0.00)	(0.24)	(0.01)	(0.00)		
LIQUIDAS	-0.09	-0.09	0.00	0.04	-0.25	1.00
	(0.00)	(0.00)	(0.93)	(0.08)	(0.00)	
PROFIT	-0.10	-0.14	0.10	-0.06	0.41	0.06
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.01)
AGE	0.07	0.05	0.11	-0.06	0.27	-0.12
	(0.00)	(0.03)	(0.00)	(0.02)	(0.00)	(0.00)
BOARD	0.11	0.09	0.20	-0.03	0.23	0.00
	(0.00)	(0.00)	(0.00)	(0.21)	(0.00)	(0.98)
NOTPUBLIC	-0.08	-0.10	-0.30	0.01	-0.05	-0.02
	(0.00)	(0.00)	(0.00)	(0.57)	(0.06)	(0.40)
AUDIT	0.06	0.08	0.10	-0.02	0.03	0.03
	(0.02)	(0.00)	(0.00)	(0.37)	(0.18)	(0.20)
CEOCHAIR	-0.06	-0.08	-0.05	0.00	-0.08	-0.03
	(0.02)	(0.00)	(0.04)	(0.96)	(0.00)	(0.34)

	PROFIT	AGE	BOARD	NOTPUBLIC	AUDIT	CEOCHAIR
PROFIT	1.00					
AGE	0.05	1.00				
	(0.04)					
BOARD	0.16	0.29	1.00			
	(0.00)	(0.00)				
NOTPUBLIC	-0.14	-0.12	-0.19	1.00		
	(0.00)	(0.00)	(0.00)			
AUDIT	0.09	0.07	0.19	-0.16	1.00	
	(0.00)	(0.00)	(0.00)	(0.00)		
CEOCHAIR	-0.10	-0.12	-0.40	0.12	-0.18	1.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	

Note: Pairwise sample correlations, with *p*-values in parentheses. For the definition of variables, see the notes to Tables 2 and 3.

Table 4 PANEL A: The Determinants of Excess Growth (DSG)

	Dependent variable: DSG					
	(1)	(2)	(3)	(4)	(5)	(6)
NOTPUBLIC	-0.56	-0.48	-0.70	-0.67	-0.68	-0.59
	-(3.09)	-(2.55)	-(3.59)	-(3.43)	-(3.41)	-(3.14)
AUDIT	0.20	0.18	0.18	0.16	0.15	0.17
	(2.59)	(2.38)	(2.25)	(1.97)	(1.90)	(2.26)
AGE		2.1E-03	-6.1E-04	-6.1E-04	-5.1E-04	-1.4E-03
		(1.88)	-(0.50)	-(0.49)	-(0.41)	-(1.23)
ASSETS		1.1E-04	1.6E-04	1.4E-04	1.5E-04	8.7E-05
		(0.64)	(0.89)	(0.82)	(0.86)	(0.48)
FIXEDAS			0.41	0.42	0.42	0.13
			(1.86)	(1.91)	(1.91)	(0.67)
LIQUIDAS			-0.28	-0.29	-0.29	-0.29
			-(2.13)	-(2.14)	-(2.16)	-(2.22)
PROFIT			-4.99	-5.01	-5.00	-3.83
			-(9.69)	-(9.69)	-(9.65)	-(8.32)
ASTURN			-0.22	-0.22	-0.22	-0.20
			-(6.57)	-(6.66)	-(6.57)	-(6.57)
BOARD				0.02	0.02	0.04
				(0.76)	(0.72)	(1.82)
CEOCHAIR				0.07	0.07	0.04
				(0.61)	(0.64)	(0.36)
CEOCHAIRL				-0.45	-0.45	-0.43
				-(2.37)	-(2.33)	-(2.33)
GROUP					-0.02	
					-(0.22)	
VCF					0.41	
					(1.17)	
Industry dummies	Yes	Yes	Yes	Yes	Yes	No
Observations	1405	1405	1405	1405	1405	1405
Log likelihood	-818.02	-815.91	-750.62	-747.47	-746.77	-789.36
Chi-squared	76.22	80.45	211.04	217.34	218.73	133.56
degrees of freedom	21	23	27	30	32	11
significance level	0.00	0.00	0.00	0.00	0.00	0.00
R^2_{KL}	0.04	0.05	0.12	0.13	0.13	0.08

Note: Probit regressions, with *t*-values in parentheses. The sample is drawn from Balance Consulting Ltd's data and augmented using data from the Helsinki Stock Exchange Group's and the Finnish Venture Capital Association's publications. Dependent variable = DSG, which is a dummy variable that is set to 1 if a firm's sales growth exceeds the firm's maximum sustainable growth rate, as defined in equation (5) of the main text. ASSETS = book value of total assets, ASTURN = ratio of ASSETS to firm's sales, FIXEDAS = ratio of tangible assets to ASSETS, LIQUIDAS = cash plus financial securities to non-liquid assets, PROFIT = ratio of earnings before interest, taxes, depreciation and amortization to sales, AGE = age of firm in years, BOARD = number of board members, NOTPUBLIC = dummy set to 1 for non-listed (private) firms, AUDIT = dummy set to 1 for firms employing a high quality auditor ('Big Five'), CEOCHAIR = dummy set to 1 for firms in which CEO holds the chair of the board of directors, CEOCHAIRL = dummy set to 1 for firms in which CEO holds the chair of the board of directors and the size of the board is larger than the median board in the sample, GROUP = dummy set to 1 for firms in that are a parent company in a group (concern), VCF = dummy set to 1 for firms that have received venture capital finance in recent past.

Table 4 PANEL B: The Determinants of Excess Growth (DSFG), continued

	Dependent variable: DSFG					
	(1)	(2)	(3)	(4)	(5)	(6)
NOTPUBLIC	-0.44	-0.32	-0.49	-0.44	-0.49	-0.40
	-(2.42)	-(1.66)	-(2.48)	-(2.27)	-(2.44)	-(2.13)
AUDIT	0.11	0.09	0.07	0.05	0.06	0.08
	(1.50)	(1.19)	(0.93)	(0.68)	(0.75)	(1.11)
AGE		2.9E-03	-4.9E-04	-7.1E-04	-5.4E-04	-1.2E-03
		(2.60)	-(0.41)	-(0.59)	-(0.44)	-(1.11)
ASSETS		2.3E-04	2.4E-04	1.8E-04	2.0E-04	1.6E-04
		(1.04)	(1.16)	(0.90)	(0.97)	(0.76)
FIXEDAS			0.91	0.91	0.92	0.51
			(4.20)	(4.19)	(4.21)	(2.68)
LIQUIDAS			-0.15	-0.15	-0.16	-0.14
			-(1.35)	-(1.34)	-(1.42)	-(1.39)
PROFIT			-4.73	-4.76	-4.74	-3.45
			-(9.61)	-(9.59)	-(9.53)	-(7.91)
ASTURN			-0.23	-0.23	-0.24	-0.19
			-(7.22)	-(7.30)	-(7.29)	-(6.60)
BOARD				0.05	0.05	0.05
				(2.18)	(2.24)	(2.48)
CEOCHAIR				0.17	0.17	0.10
				(1.54)	(1.54)	(0.96)
CEOCHAIRL				-0.43	-0.41	-0.36
				-(2.42)	-(2.29)	-(2.14)
GROUP					-0.09	
					-(1.00)	
VCF					0.47	
					(1.34)	
Industry dummies	Yes	Yes	Yes	Yes	Yes	No
Observations	1405	1405	1405	1405	1405	1405
Log likelihood	-889.59	-885.06	-815.57	-811.54	-810.21	-870.10
Chi-squared	82.98	92.04	231.01	239.08	241.74	121.96
degrees of freedom	21	23	27	30	32	11
significance level	0.00	0.00	0.00	0.00	0.00	0.00
R^2_{KL}	0.04	0.05	0.12	0.13	0.13	0.07

Note: Probit regressions, with *t*-values in parentheses. The sample is drawn from Balance Consulting Ltd's data and augmented using data from the Helsinki Stock Exchange Group's and the Finnish Venture Capital Association's publications. Dependent variable = DSFG, which is a dummy variable that is set to 1 if a firm's sales growth exceeds the firm's maximum short-term financed growth rate, as defined in equation (4) of the main text. ASSETS = book value of total assets, ASTURN = ratio of ASSETS to firm's sales, FIXEDAS = ratio of tangible assets to ASSETS, LIQUIDAS = cash plus financial securities to non-liquid assets, PROFIT = ratio of earnings before interest, taxes, depreciation and amortization to sales, AGE = age of firm in years, BOARD = number of board members, NOTPUBLIC = dummy set to 1 for non-listed (private) firms, AUDIT = dummy set to 1 for firms employing a high quality auditor ('Big Five'), CEOCHAIR = dummy set to 1 for firms in which CEO holds the chair of the board of directors, CEOCHAIRL = dummy set to 1 for firms in which CEO holds the chair of the board of directors and the size of the board is larger than the median board in the sample, GROUP = dummy set to 1 for firms that are a parent company in a group (concern), VCF = dummy set to 1 for firms that have received venture capital finance in recent past.

Table 5 Chiappori and Salanié (2000) Tests

	1	2	3	4a	4b
CS1	3.75	5.99	5.68	7.04	1.48
	(0.05)	(0.01)	(0.02)	(0.01)	(0.22)
CS2	0.09	0.12	0.12	0.19	0.09
	(0.06)	(0.02)	(0.02)	(0.01)	(0.25)

Note: CS1 and CS2 are tests for conditional independence of the (generalized) residuals from the Probit regressions on DSG and AUDIT, with p-values in parentheses. For details of the two tests, see Chiappori and Salanié (2000, p. 66-67). The numbering of the columns refers to the different specifications used to estimate the pairs of Probit models: In column 1, the included variables are ASSETS = book value of total assets, ASTURN = ratio of ASSETS to firm's sales, FIXEDAS = ratio of tangible assets to ASSETS, LIQUIDAS = cash plus financial securities to non-liquid assets, PROFIT = ratio of earnings before interest, taxes, depreciation and amortization to sales, AGE = age of firm in years, BOARD = number of board members, NOTPUBLIC = dummy set to 1 for non-listed (private) firms, CEOCHAIR = dummy set to 1 for firms in which CEO holds the chair of the board of directors, CEOCHAIRL = dummy set to 1 for firms in which CEO holds the chair of the board of directors and the size of the board is larger than the median board in the sample, GROUP = dummy set to 1 for firms that are a parent company in a group (concern), VCF = dummy set to 1 for firms that have received venture capital finance in recent past; In column 2 the included variables are the same as in column 1 plus the level of a firm's sales, the ratio of dividends to sales, and the firm's equity multiplier. In column 3 the included variables are the same for DSG as in column 1, but for AUDIT they are NOTPUBLIC, AGE, BOARD, CEOCHAIR, CEOCHAIRL, and GROUP; In columns 4a and 4b the included variables are the same as in column 1, but the sample is split based on the median of ASSETS. The firms with ASSETS smaller (larger) than the median were used to compute the test values in column 4a (4b).

Table 6 Excess Growth (DSG) and a Priori Classification of Firms

	Dependent variable: DSG					
	S. Div.	L. Div.	Indebt	Not indebt	Indep.	Group
NOTPUBLIC	-1.05	-0.58	-0.94	-0.65	-	-0.58
	-(2.48)	-(2.27)	-(2.38)	-(2.55)	-	-(2.59)
AUDIT	0.26	-0.05	0.25	0.02	0.19	-0.03
	(2.37)	-(0.40)	(2.19)	(0.12)	(2.01)	-(0.19)
AGE	-2.8E-04	-1.1E-03	-6.5E-04	-1.1E-04	2.0E-04	-1.2E-03
	-(0.16)	-(0.58)	-(0.33)	-(0.06)	(0.12)	-(0.62)
ASSETS	-8.7E-04	7.2E-04	-8.4E-04	4.3E-04	-1.0E-03	1.7E-04
	-(1.70)	(1.21)	-(1.60)	(0.96)	-(0.47)	(0.86)
FIXEDAS	0.09	0.59	0.18	0.32	0.50	0.10
	(0.31)	(1.54)	(0.52)	(0.93)	(1.85)	(0.22)
LIQUIDAS	-0.22	-0.04	-0.28	-0.04	-0.21	-0.68
	-(0.99)	-(0.25)	-(1.22)	-(0.26)	-(1.48)	-(1.53)
PROFIT	-3.31	-7.31	-4.48	-5.24	-6.06	-5.06
	-(4.67)	-(7.45)	-(5.36)	-(6.58)	-(8.54)	-(5.19)
ASTURN	-0.19	-0.54	-0.19	-0.34	-0.20	-0.60
	-(4.96)	-(6.61)	-(4.34)	-(5.31)	-(5.51)	-(4.98)
BOARD	4.7E-03	0.01	0.05	0.02	0.03	-0.01
	(0.14)	(0.29)	(1.40)	(0.46)	(0.97)	-(0.26)
CEOCHAIR	0.17	0.03	0.11	0.19	0.03	0.39
	(1.06)	(0.18)	(0.73)	(0.97)	(0.25)	(1.32)
CEOCHAIRL	-0.51	-0.24	-0.80	-0.20	-0.30	-0.81
	-(1.99)	-(0.75)	-(2.84)	-(0.65)	-(1.25)	-(2.10)
Observations	702	703	678	678	998	407
Log likelihood	-410.90	-291.18	-371.82	-302.74	-509.59	-217.31
Chi-squared	111.75	149.11	118.08	111.12	157.80	93.07
degrees of freedom	30	30	30	30	29	30
significance level	0.00	0.00	0.00	0.00	0.00	0.00
R^2_{KL}	0.12	0.20	0.14	0.16	0.13	0.18

Note: Probit regressions, with *t*-values in parentheses. The sample is drawn from Balance Consulting Ltd's data and augmented using data from the Helsinki Stock Exchange Group's and the Finnish Venture Capital Association's publications. Dependent variable = DSG, which is a dummy variable that is set to 1 if a firm's sales growth exceeds the firm's maximum sustainable growth rate, as defined in equation (5) of the main text. ASSETS = book value of total assets, ASTURN = ratio of ASSETS to firm's sales, FIXEDAS = ratio of tangible assets to ASSETS, LIQUIDAS = cash plus financial securities to non-liquid assets, PROFIT = ratio of earnings before interest, taxes, depreciation and amortization to sales, AGE = age of firm in years, BOARD = number of board members, NOTPUBLIC = dummy set to 1 for non-listed (private) firms, AUDIT = dummy set to 1 for firms employing a high quality auditor ('Big Five'), CEOCHAIR = dummy set to 1 for firms in which CEO holds the chair of the board of directors, and CEOCHAIRL = dummy set to 1 for firms in which CEO holds the chair of the board of directors and the size of the board is larger than the median board in the sample. The sample split is as follows: S. Div (L. Div.) = Small (large) dividend firms, defined as firms paying a smaller (larger) dividend relative to its sales than the median firm in the estimating sample, 'Indebt' ('Not indebt') = High-leverage (low-leverage) firms, defined as firms having an equity multiplier larger (smaller) than that of the median firm in the estimating sample, 'Indep' ('Group') = firms for which GROUP is 0 (1).

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