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What Determines the Use of Capital Budgeting Methods? Evidence from Swedish Listed Companies

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Abstract Purpose: This paper aims to extend and contribute to prior research on the association between company characteristics and choice of capital budgeting methods (CBMs). **Design/methodology/approach:** A multivariate regression analysis on questionnaire data from 2005 and 2008 is used to study which factors determine the choice of CBMs in Swedish listed companies. **Findings:** Our results supported hypotheses that Swedish listed companies have become more sophisticated over the years (or at least less unsophisticated) which indicates a closing of the theory-practice gap; that companies with greater leverage used payback more often; and that companies with stricter debt targets and less management ownership employed accounting rate of return more frequent. Moreover, larger companies used CBMs more often. **Originality/value:** The paper contributes to prior research within this field by being the first Swedish study to examine the association between use of CBMs and as many as twelve independent variables, including changes over time, by using multivariate regression analysis. The results are compared to a US and a continental European study.

Keywords: investment decisions, capital budgeting methods, project valuation, Swedish listed companies, CFO, sophisticated use

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1. Introduction

Management's investment decision is pivotal for the success of any company and over the years a number of capital budgeting methods have evolved. The capital budgeting method choice is not arbitrary, and textbooks in financial management often recommend the net present value method, while discouraging the use of other techniques, such as the undiscounted payback method (Brealey and Myers, 2003; Lumby and Jones, 2003; Smart et al., 2004; Ross et al., 2005).

We use multivariate regression analysis on questionnaire data from 2005 and 2008 to study which factors determine the choice of capital budgeting methods in Swedish listed companies. Our first question is to what extent the recommended methods actually are used, i.e., is there a gap between theory and practice? Second, we investigate the average total use of capital budgeting methods. Do Swedish listed companies typically use just one method, or are two or even more used concurrently? Third, we examine what factors determine the use of the methods. For example, does size matter as suggested by Stanley and Block, (1984), Pike (1988, 1996), Graham and Harvey (2001), Sandahl and Sjögren (2003), and Brounen et al. (2004)? The relation between size and eleven other independent variables and eight capital

budgeting methods are analysed. Finally we compare our results to studies of U.S. (Graham and Harvey, 2001) and continental European (Brounen et al., 2004) listed companies, which used data responding to the same questionnaire as used here.

Capital budgeting decisions are very important for financial managers, since they determine the choice of investment projects that will affect company value. The use of capital budgeting methods by U.S. and European listed companies has been studied extensively (e.g., besides those already mentioned, Pike, 1988, 1989, 1996; Pike and Sharp, 1989; Sangster, 1993; Block, 2007; Hermes et al., 2007). [1] There have also been some earlier studies of Sweden (Renck, 1966; Tell, 1978; Yard, 1987; Andersson, 1994; Segelod, 1995; Sandahl and Sjögren, 2003; Holmén and Pramborg, 2009; Hartwig, 2012).

The present study differs in one important respect from previous similar studies, the majority of which are based on purely descriptive statistics. [2] Most studies thus explore only use or non-use, or the frequency of use, of capital budgeting methods, and not the association between use and independent variables. When relationships between use and independent variables have been studied (e.g., Hartwig, 2012), only descriptive statistical methods such as correlation analysis and independent-samples t-tests are utilised, so the results cannot be interpreted causally [3].

Our results confirm previous findings that larger companies tend to use capital budgeting methods more often when deciding on investments. The choice of capital budgeting methods is also influenced by financial leverage, growth opportunities, dividend pay-out policies, the choice of target debt ratio, degree of management ownership, foreign sales, and the education and other individual characteristics of the CEO. The total use of capital budgeting methods is lower in Sweden than in the U.S. (Graham and Harvey, 2001), and continental Europe (Brounen et al., 2004).

The next section presents capital budgeting methods and explains why some of them are recommended by textbooks and others not. Data and descriptive statistics on the use of capital budgeting methods in Swedish listed companies are presented in Section 3. Section 4 then presents the empirical method and hypotheses to be tested. Results are presented and discussed in Section 5. Section 6 summarises and draws conclusions.

2. The Use of Capital Budgeting Methods

When evaluating investments, top managers can choose among many capital budgeting methods, some recommended in textbooks, others not. In accordance with Graham and Harvey (2001), we distinguish twelve capital budgeting methods (Table 1).

Table 1. Capital budgeting methods, recommended or not by textbooks

Method	Recommended or not
a) Net present value (NPV)	Recommended
b) Internal rate of return (IRR)	Not recommended
c) Annuity	Recommended
d) Earnings multiple (P/E)	Not recommended
e) Adjusted present value (APV)	Recommended
f) Pay-back	Not recommended
g) Discounted pay-back	Not recommended
h) Profitability index	Recommended
i) Accounting rate of return (ARR)	Not recommended
j) Sensitivity analysis	Recommended
k) Value-at-risk (VAR)	Recommended
l) Real options	Recommended
Method	Recommended or not
a) Net present value (NPV)	Recommended
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e) Adjusted present value (APV)	Recommended
f) Pay-back	Not recommended
g) Discounted pay-back	Not recommended
h) Profitability index	Recommended
i) Accounting rate of return (ARR)	Not recommended
j) Sensitivity analysis	Recommended
k) Value-at-risk (VAR)	Recommended
l) Real options	Recommended

As noted, methods such as net present value (NPV) that discount cash flows, are often recommended in financial management textbooks. Brealey and Myers (2003), for example, has a chapter on “why net present value leads to better investment decisions than other criteria”. NPV is recommended since it incorporates all cash-flows that the investment generates as well as the time value of money.

Other methods, such as the internal rate of return (IRR) and pay-back methods are often criticised. IRR can be misleading when a choice must be made among mutually exclusive projects, and also because of so-called multiple rates of return (Ross et al., 2005), yet it is often used (Graham and Harvey, 2001; Sandahl and Sjögren, 2003; Brounen et al., 2004; Bennouna et al., 2010).

Pay-back methods do not consider the time value of money, and also ignores cash-flows that occur after the maximum pay-back time (as defined by management), yet it is also often used (Graham and Harvey, 2001; Sandahl and Sjögren, 2003; Brounen et al., 2004; Bennouna et al., 2010). Discounted pay-back does not ignore the time value of money, but still ignores cash-flows after the maximum pay-back point.

The earnings multiple or price/earnings (P/E) method is a variation on pay-back methods since it calculates how many years it will take until the initial investment (the share price) will be paid back by earnings. It considers earnings instead of cash-flows and only considers one earnings figure (instead of many), and again does not take the time value of money into consideration. On the other hand, this relative valuation method has the advantage of letting the more or less efficient capital market guide the decision.

The main disadvantage with ARR is (as the name suggests) that it uses accounting numbers (instead of cash-flows) and again does not consider the time value of money (Ross et al., 2005). Note that management can affect accounting numbers positively through real actions even though their actions may have negative effects on long-term value (Graham et al. (2005).

In principal, sensitivity analysis has no drawbacks, and should be applied to see whether an investment will still be profitable if one or more variables are changed. Another method with no obvious drawbacks is real options. It has been suggested that the reason why many projects which look unprofitable at first glance are made nevertheless is that management explicitly or implicitly incorporated the possibility of making subsequent investments (conditioned on the current project) in the project evaluation.

Value-at-risk (VAR), measuring “...the worst loss over a target horizon that will not be exceeded with a given level of confidence” (Jorion, 2006; page viii), is a rather new method. A disadvantage is that it does not estimate how bad the loss might be if market conditions turn abnormal (such as happened widely in 2008-2009).

When the highest net present value per monetary unit of the initial outlay is calculated, a so-called profitability index has been established. A potential limitation is that, if applied carelessly and investment resources are constrained, it can give bad advice (Brealey and Myers, 2003).

APV adds the value of any financial side-effects of an investment to NPV, and should in principle have no drawbacks (Ross et al., 2005). The annuity method is also

a variant of NPV. If you know the annuity of an investment, and how many years it should generate net cash-inflows or outflows, then you can easily calculate its NPV by discounting the annuity with the relevant weighted average cost of capital.

3. Data and Descriptive Statistics

To analyse what determines the choice of capital budgeting methods in Sweden, a questionnaire (Appendix 1) was sent in 2005 and 2008 to the CFOs of all Swedish companies listed on the Stockholm Stock Exchange. To facilitate a comparison between the surveys, the questions were the same as used by Graham and Harvey (2001) and Brounen et al. (2004). [4] If no executive had the title CFO, then the questionnaire was sent to another senior executive (controller, treasurer, or CEO) responsible for financial management.

In 2005, the questionnaire was sent to 244 companies by postal mail three times, with response deadlines 8 January, 14 March, and 23 May. Non-respondents by the first deadline were contacted by phone to encourage them to respond. In the end, 112 questionnaires (45.9%) were returned. However, seven were not useable and were dropped, leaving an adjusted response rate of 43.0%.

In 2008, the questionnaire was sent to 249 companies by postal mail four times, with response deadlines 18 February, 10 March, 3 April, and 16 June. Again, non-respondents by the first deadline were contacted by phone. In the end, 92 (36.9%) questionnaires were returned. Four were not useable, leaving an adjusted response rate of 35.3%. The total adjusted response rate for the two surveys was thus 39.1%, compared to 9% for Graham and Harvey (2001) and 5% for Brounen et al. (2004).

In simple probit analysis of the response rate the probability of response was statistically significantly higher for larger companies, and the probability to answer the survey was higher in 2005 compared to 2008. Industry classification, P/E-ratio, degree of leverage, and dividend pay-out level did not have statistically significant effects on the probability of response (Table A1 in Appendix 2).

The questionnaire made clear that questions regarding capital investment referred to all non-routine capital investments accepted or rejected at group/parent-company level. The reason for this framing was that otherwise, i.e., if questions were taken to refer to *all* investments in the company (including investments accepted or rejected at subsidiary level), then the respondents probably would not be able to give credible answers.

3.1. Dependent Variables

The questionnaire (Appendix 1) consists of three main questions regarding the use of capital budgeting and cost-of-capital estimation techniques. [5] Data from question one, "How often do you use the following capital budgeting methods (on a scale of 0 to 4, with 0 = never and 4 = always)?" was used to construct our dependent variables. The capital budgeting methods asked about were:

- Net-present value (NPV)
- Internal rate of return (IRR)
- Annuity
- Earnings multiple

- The adjusted present value (APV)
- Pay-back
- Discounted pay-back
- Profitability index
- Accounting rate of return (ARR)
- Sensitivity analysis
- Value-at-risk (VAR)
- Real options

The number and share of respondents reporting that they occasionally or never use or frequently or always use each method are reported in Table 2. Annuity, adjusted present value (APV), value-at-risk, and real options were far less used than the other methods. We excluded them from further analysis as not providing sufficient variation to analyze.

Table 2. Number and proportion of companies that used each capital budgeting Method never or occasionally (0-2) vs frequently or always (3-4)

Capital budgeting method	0-2	%	3-4	%
(a) NPV	75	38.86%	118	61.14%
(b) IRR	135	69.95%	58	30.05%
(c) Annuity	187	96.89%	6	3.11%
(d) Earnings multiple approach	139	72.02%	54	27.98%
(e) APV	180	93.26%	13	6.74%
(f) Pay-back	88	45.60%	105	54.40%
(g) Discounted pay-back	160	82.90%	33	17.10%
(h) Profitability index	169	87.56%	24	12.44%
(i) ARR	147	76.17%	46	23.83%
(j) Sensitivity analysis	106	54.92%	87	45.08%
(k) VAR	180	93.26%	13	6.74%
(l) Real options	189	97.93%	4	2.07%

The recommended methods used frequently or always by the most listed companies in Sweden were the net present value (61%) and sensitivity analysis (45%), but not recommended pay-back method was used frequently or always by 54% of the respondents.

Mean values, standard deviations, and differences in mean values for the most used capital budgeting methods in 2005 and 2008 are reported in Table 3. Higher mean values indicate more extensive use of the method.

Table 3. Mean values, standard deviations, and differences in mean values for the most used capital budgeting methods in 2005 and 2008

Dependent variable	2005		2008		Difference
	Mean	Sd	Mean	Sd	
(a) NPV	2.50	1.38	2.55	1.38	0.05
(b) IRR	1.57	1.58	1.27	1.45	-0.30***
(d) Earnings multiple	1.36	1.61	1.41	1.57	0.05
(f) Pay-back	2.39	1.41	2.20	1.47	-0.19
(g) Discounted pay-back	1.08	1.42	0.74	1.31	-0.34***
(h) Profitability index	0.69	1.26	0.72	1.20	0.03
(i) ARR	1.14	1.55	1.05	1.45	-0.10
(j) Sensitivity analysis	1.92	1.63	2.05	1.53	0.12

Note: *** indicates that the difference is statistically significant at the 1% level.

The differences between 2005 and 2008 are small, usually not significantly different from zero. The biggest differences are that IRR and the discounted pay-back

(both not recommended) were less used in 2008 than in 2005.

Figure 1 compares the total use of capital budgeting methods by listed Swedish companies (287%) to U.S. results (413%, Graham and Harvey, 2001) and continental European results (308-388%, Brounen et. al, 2004). Total use was calculated as the sum of column 3 on Table 2, and

was thus much lower in Sweden compared to the U.S. and continental Europe.

The differences between Sweden and the U.S. or continental Europe are surprising since our data only is from listed companies, which should mean more use of capital budgeting methods (since listed companies are presumably more sophisticated, gathering more information before making investments).

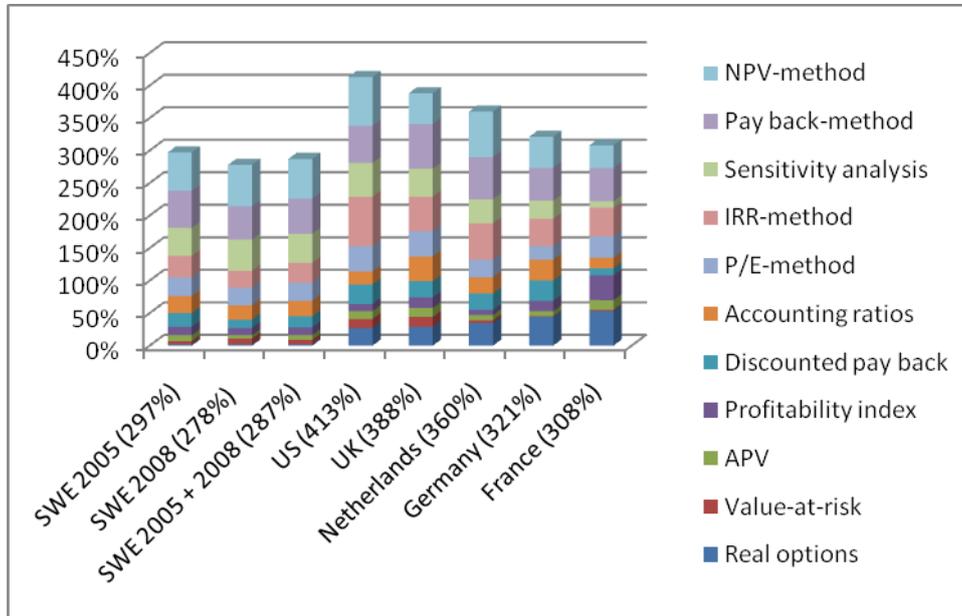


Figure 1. The total stated use of capital budgeting techniques in Swedish

Figure 2 compares use of each method across countries. A recommended method that is very uncommon in Sweden compared to the U.S. and continental Europe is incorporation of real options. But other recommended

methods such as NPV and sensitivity analysis were used more frequently by Swedish listed companies than by most continental European ones.

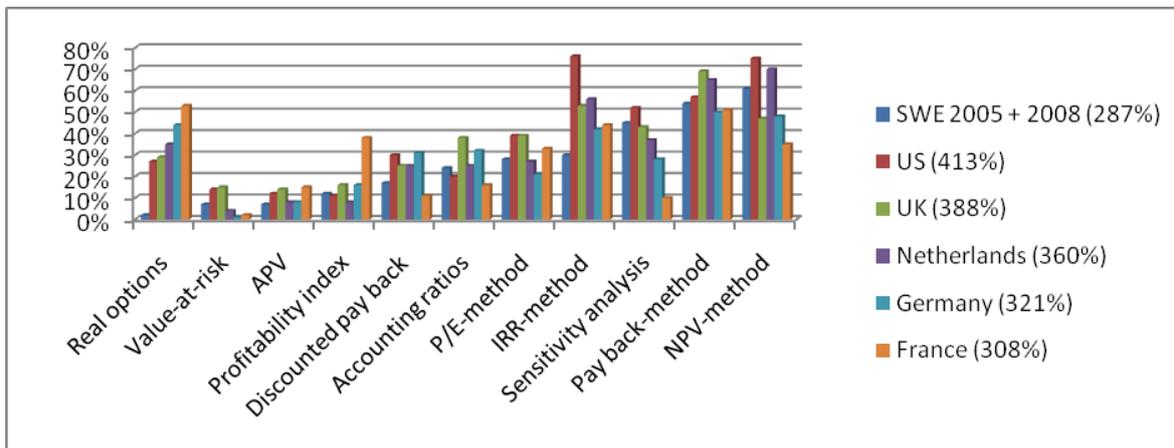


Figure 2. The stated use of different capital budgeting techniques in Swedish companies compared to companies in the US and continental Europe

3.2. Independent variables

We use information on company size, company leverage, growth opportunities, dividend payout levels, industry classification (manufacturing or not), target debt ratio, proportion of foreign sales, proportion of shares owned by the management, changes over time (a year dummy), as well as the age, educational attainment and the tenure of the CEO to analyze which variables influence the reported use of capital budgeting methods. Definitions, means, and standard deviations are presented

in Table 4. The variables included are further discussed in Section 4.

Data on target debt-ratio, proportion of foreign sales, proportion of shares owned by management, and characteristics of the CEO are obtained from the questionnaire, while data on company size, growth opportunities, leverage, industry classification, and dividend payments come from *Datastream*. [6] Data was intentionally obtained from *Datastream* for 2004 and 2007 to prevent a possible endogeneity problem, since previous year's values are predetermined.

Company size is approximated by revenues adjusted for inflation using the Swedish Consumer Price Index published by Statistics Sweden. Growth opportunities are proxied by the price-earnings (P/E) ratio because high P/E-ratios are thought to mean that the capital market

expects the company to have high future growth, and leverage is measured by the debt-to-asset ratio. Even though it may be the CFO who chooses the capital budgeting method, questions regarding the CEO were asked since the CFO is seen as the CEO's agent.

Table 4. Means, standard deviations, definitions and sources of independent variables

Independent variable	Mean	SD	Definition and source
<i>SIZE</i> (millions)	13.1	31.8	Deflated revenues in SEK. Source: Datastream.
<i>LEVERAGE</i>	0.21	0.19	Total debt to total assets ratio. Source: Datastream.
<i>DIVPAY</i>	0.24	0.96	Dividend pay-out ratio. Dividend divided by net income. Source: Datastream.
<i>GROWTH</i>	9.20	66.44	P/E ratio. Source: Datastream.
<i>DMAN</i>	0.40	0.49	Dummy taking the value one if the company could be classified as manufacturing. Source: Datastream.
<i>TARGET_DEBT</i>	2.24	1.02	Whether the company had no (1) or a strict (4) target debt-ratio. Source: Survey (question 9).
<i>FSALES</i>	3.30	0.98	The proportion of total sales that took place outside Sweden, ranging from 0% (1) to > 50% (4). Source: Survey (question 12)
<i>MAN_OWN</i>	1.38	0.93	Share of the company that would be owned by the top three officers if all options had been exercised, ranging from < 5% (1) to > 20% (4). Source: Survey (question 12).
<i>CEO_AGE</i>	2.43	0.73	Age of the CEO ranging from < 40 years (1) to > 60 years (4). Source: Survey (question 12).
<i>CEO_EDUC</i>	1.82	0.84	Dummy taking the value one if the CEO had a Masters in Business and/or Economics. Source: Survey (question 12).
<i>CEO_TENURE</i>	1.61	0.75	Number of years the CEO had been CEO in the company, ranging from < 4 year (1) to > 9 year (3). Source: Survey (question 12).
<i>DYEAR</i>	0.46	0.50	Dummy, taking the value one in 2008, zero in 2005.

The relationships among the independent variables were investigated using Pearson product-moment correlation coefficients (Table A2 in Appendix 3), with multicollinearity found to be limited. The highest correlation coefficient was 0.48, while most were far lower.

4. Empirical Method and Hypotheses

To analyze what determines the reported use of capital budgeting method, the following equation is estimated using ordinary least square (OLS):

$$\begin{aligned}
 CBT_{it}^j = & \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 GROWTH_{it} \\
 & + \alpha_3 LEVERAGE_{it} + \alpha_4 TARGET_DEBT_{it} \\
 & + \alpha_5 DIVPAY_{it} + \alpha_6 FSALES_{it} \\
 & + \alpha_7 MAN_OWN_{it} + \alpha_8 CEOEDUC_{it} \\
 & + \alpha_9 CEOAGE_{it} + \alpha_{10} CEOTENURE_{it} \\
 & + \alpha_{11} DMAN_{it} + \alpha_{12} DYEAR_t + e_{it}
 \end{aligned} \quad (1)$$

where CBT_{it}^j is the reported use of capital budgeting method j ($j=1,2,\dots,8$) by company i ($i=1,2,\dots,152$) during year t ($t=2005, 2008$). As noted earlier, $SIZE_{it}$ is deflated revenues (for company i during year t); $LEVERAGE$ is the debt-to-assets ratio; $GROWTH$ is the price-earnings ratio; $TARGET_DEBT$ reflects a survey question whether the company had a strict or flexible debt target; MAN_OWN reflects a survey question on the proportion of shares owned by management; $CEOEDUC$ reflects the educational attainment of the CEO; $CEOAGE$ reflects CEO's age; $CEOTENURE$ reflects how long the CEO has had that position; $DMAN$ is a dummy taking the value one if the company can be classified as a manufacturing company, and zero otherwise; $DIVPAY$ is company i 's dividend payout ratio; $FSALES$ reflects a survey question on the proportion of foreign sales; and $DYEAR$ is a dummy taking the value zero in 2005, and one in 2008.

When estimating Equation (1), we expect size to be related to the use of recommended capital budgeting methods (Pike, 1988, 1996; Graham and Harvey, 2001;

Sandahl and Sjögren, 2003; Brounen et al., 2004; Verbeeten, 2006) because large companies tend to deal with larger projects, making the use of more sophisticated methods less costly (Payne et al., 1999; Hermes et al., 2007).

We expect high leverage to be related to the use of the non-recommended pay-back method, which has been found to be positively associated with economic uncertainty (Schall and Sundem, 1980; Binder and Chaput, 1996). Simpler rules (such as pay-back) can be more attractive in an uncertain setting, since the costs of accurately estimating the inputs for more complicated discounting-based calculations are higher (Binder and Chaput, 1996). An alternative explanation as to why high leverage companies might be expected to use pay-back more often is that they are under more financial pressure and might therefore feel a need to find investments that quickly "pay back" the initial investment.

We expect growth companies to use two recommended methods more frequently. First, finance textbooks teach that IRR should not be used to rate mutually exclusive projects [7], which growth companies might have more of than mature companies. Growth companies might also be more likely to calculate the profitability index, because if they have more potential new investment projects [8], and thus reject more, it would be important that the accepted ones give the highest possible NPV per unit invested, and the only way to establish that is through calculating the profitability index.

We expect companies with strict debt targets to use the non-recommended ARR method more often. Companies which are closer to violating accounting-based debt covenants have been found more likely to choose income enhancing accounting solutions which reduce the risk of "costly" technical default (Watts and Zimmerman, 1990). The same thing might happen with regard to "internal debt covenants" (i.e., debt targets); the higher the "cost" of violating the accounting based debt target, the more the company might consider how an investment would affect accounting numbers. Companies with a stricter target might thus tend to consider an investment's impact on the

accounting debt-ratio to a higher extent (so that the target debt-ratio is not “violated”). The accounting rate of return indicates how an investment is expected to affect the debt ratio, and could therefore be employed more extensively in strict debt-target companies.

We expect companies with greater management ownership to use recommended methods more often. Ownership structure can have an impact on managerial decisions and company performance (Warfield et al., 1995; Klassen, 1997), and companies with greater managerial ownership have been found to be less likely to experience financial distress (Donker et al., 2009), perhaps because managers then have more to lose if the company goes bankrupt. Management ownership may thus reduce management opportunism and increase use of recommended capital budgeting methods.

On the other hand, with greater separation of ownership (principals) and management (agents) incentives can arise for managers to pursue non-value maximising behaviour (Jensen and Meckling, 1976). To remedy this, contracts often stipulate that management’s remuneration should be based on accounting numbers. Top managers’ discretion over both business activities and accounting choices makes it possible for them to manage earnings upwards, to maximise their own bonus payments (Healy, 1985). Managers can thus take either *accounting actions* or *realactions* to manage earnings or other accounting figures (Dechow and Skinner, 2000). [9] Managers focused on meeting accounting figures might reject a profitable investment (with positive NPV) if the calculated accounting rate of return is too low. [10] Graham et al. (2005) showed that top management was willing to sacrifice long-term value just to meet accounting targets. [11] We believe that this focus on accounting numbers is more profound in companies with low levels of management ownership, and we therefore expect that management owned companies use ARR less frequent.

We expect more educated and younger CEOs to use recommended methods (Hermes et al., 2007), with which they might be more familiar and to which they might be more open. We also expect new CEOs to use more “socially acceptable” (often recommended methods), whereas CEOs with more company-specific experience might be more relaxed and choose simpler methods, perhaps viewing them as “good enough”. But more experienced CEOs might choose more recommended methods if taught their value by experience.

There might also be industry-specific differences when it comes to the use of methods. We expect manufacturing companies to use more recommended methods because they are often larger, more capital intensive with higher sunk costs.

We expect that companies with a higher dividend payout ratio use profitability index calculations methods less often because (apart from expectations about future positive cash flows and profits) a higher dividend payout indicates that the company is liquid, making capital rationing less likely.

We expect a positive relation between foreign sales, presumably reflecting a higher proportion of foreign investments, with attendant currency and political risks, and use of sensitivity analysis. Moreover, we expect that foreign sales is positively associated with the pay-back method. [12] Holmén and Pramborg (2009) documented

that the use of the payback method increases with political risk. The suggested reason for the observed positive relation (between political risk and the pay-back method) is that political risk is difficult to estimate (i.e. rendering high deliberation costs).

Finally, we expect more use of recommended methods in 2008 than in 2005, because the use of capital budgeting methods has become more sophisticated over time (Klammer and Walker, 1984; Pike, 1996; Ryan and Ryan, 2002; Sandahl and Sjögren, 2003; Singh et al., 2012; Bennouna et al., 2010).

5. Results and Discussion

Company size has generally been positively correlated with the use of recommended capital budgeting methods (Graham and Harvey, 2001; Brounen et al., 2004). We find that large companies use NPV (recommended), IRR (not recommended), pay-back (not recommended), and sensitivity analysis (recommended) more than small companies; results for the other methods were smaller and less statistically significant (Table 5).

Contrary to our results, Graham and Harvey (2001) found a statistically significant *negative* relation between size and pay-back in particular in the U.S., while Brounen et al. (2004) found no statistically significant relation between size and pay-back in any of their four continental European countries (Germany, France, Netherlands, and UK).

Contrary to our expectations, Swedish listed companies with higher growth opportunities (which we measured by their P/E ratio) used IRR (not recommended) more often but profitability index (recommended) less often. Possibly the P/E ratio is a bad proxy for growth opportunities, or maybe “growth companies” actually have or assess fewer investment opportunities than do mature companies.

High-leverage companies employed the pay-back method more frequent, confirming our hypothesis that companies with a high level of financial risk are more likely to use the non-recommended, and non-discounting based, pay-back method. However, high leveraged companies also had a tendency to utilise NPV and IRR, which both are discounting based methods, more extensively than low leveraged companies, supporting results presented previously by Graham and Harvey (2001).

Confirming our expectations, companies with stricter debt targets used ARR (not recommended) more often. Companies with stricter debt targets also employed the profitability index (recommended) more, a result also found by Graham and Harvey (2001).

Contrary to what we expected, companies with a higher dividend pay-out level utilised profitability index more extensively, as well as using IRR (not recommended) and sensitivity analysis (recommended) more. Companies with more foreign sales used profitability index less. Moreover, foreign sales was not significantly positively related to the use of the pay-back method. The latter result thus fails to support the findings in Holmén and Pramborg (2009).

Management-owned companies used ARR (not recommended) and sensitivity analysis (recommended) less often, supporting previous findings that ownership structure influence management decisions (Gul et al., 2002; Hutchinson and Leung, 2007; Siregar and Utama,

2008). Management-owned companies might use ARR because of greater goal-congruence between agent and principal, with owners more interested in the economic than accounting returns of an investment. There may also

be other (preferred) communicative and monitoring tools than formal accounting numbers in companies with high management (Eng and Mak, 2003), making an investment's impact on accounting rate of return not as important.

Table 5. Estimation results

Variable		(a) NPV	(b) IRR	(d) EM	(f) PB	(g) DPB	(h) PI	(i) ARR	(j) SA
SIZE	Coef.	0,00598**	0,00975***	0,00261	0,00623*	0,00131	-0,00146	-0,00172	0,00742**
	t-value	2.28	2.72	0.85	1.94	0.38	-0.75	-0.46	2.61
GROWTH	Coef.	0,0033	0,0034**	-0,0004	0,0010	0,0015	-0,0021***	0,0016	0,0022
	t-value	1.64	2.00	-0.27	1.06	1.12	-2.76	1.59	1.28
LEVERAGE	Coef.	1,15*	1,52**	-0,34	1,37**	0,59	-0,11	0,45	0,34
	t-value	1.78	2.32	-0.48	2.16	0.89	-0.17	0.61	0.49
TARGET_DEBT	Coef.	0,02	0,13	0,00	0,12	-0,06	0,16*	0,30**	0,11
	t-value	0.17	1.12	0.04	1.06	-0.60	1.69	2.45	0.89
DIVPAY	Coef.	-0,12	-0,35***	-0,04	-0,01	-0,19	0,13*	0,05	-0,20*
	t-value	-1.13	-3.40	-0.24	-0.15	-1.08	1.73	0.41	-1.88
FSALES	Coef.	0,06	0,06	-0,05	0,18	0,30	-0,27**	-0,09	0,20
	t-value	0.54	0.49	-0.32	1.41	0.28	-2.16	-0.70	1.41
MAN_OW	Coef.	-0,03	-0,04	-0,24	-0,06	-0,11	0,03	-0,26**	-0,33**
	t-value	-0.18	-0.25	-1.59	-0.45	-0.76	0.30	-2.16	-2.04
CEO_EDUC	Coef.	0,01	0,36**	0,22	0,17	0,29**	-0,09	0,17	0,25
	t-value	0.08	2.34	1.28	1.04	2.14	-0.46	1.09	1.42
CEO_AGE	Coef.	-0,04	-0,04	-0,13	-0,13	0,11	-0,05	0,34*	-0,32*
	t-value	-0.22	-0.22	-0.63	-0.79	0.67	-0.32	1.95	-1.68
CEO_TENURE	Coef.	-0,07	0,25	0,05	0,11	0,08	-0,10	-0,13	0,33*
	t-value	-0.37	1.43	0.25	0.63	0.49	-0.72	-0.80	1.78
DMAN	Coef.	-0,18	0,25	-0,47*	0,14	0,25	-0,47**	-0,13	-0,14
	t-value	-0.73	1.08	-1.69	0.59	1.11	-2.37	-0.59	-0.51
DYEAR	Coef.	-0,13	-0,82***	-0,31	-0,41	-0,64***	-0,05	-0,23	-0,33
	t-value	-0.54	-3.23	-1.08	-1.55	-2.77	-0.24	-0.91	-1.18
CONSTANT	Coef.	2,38***	0,14	2,16**	1,154	0,32	1,88	0,28	1,52*
	t-value	3.61	0.17	2.43	1.56	0.50	3.07	0.38	1.80
R ²		0.08	0.19	0.08	0.10	0.08	0.15	0.15	0.12

The reduced use of sensitivity analysis (recommended) by management-owned companies could be interpreted as contradicting the argument that owner-managers would tend to use more sophisticated methods. But it could also be that non-owner managers estimate how sensitive ARR (rather than, say NPV) is to changes in the assumptions (thus not necessarily leading to increased shareholder value). And it could be that non-owner managers make ARR estimations "internally" (to see how the accounting numbers are affected), but show NPV-based sensitivity analyses to other executives/board members to legitimise their investment choice (Dowling and Pfeffer, 1975; Gray et al., 1996).

As expected, older CEOs used the accounting rate of return (not recommended) more often, but sensitivity analysis (recommended) less. On the other hand, CEOs with long tenure used sensitivity analysis more often. Contrary to expectations, more educated CEOs used both IRR (not recommended) and discounted pay-back (not recommended) more. A positive association between CEO education and use of IRR has also been found in the U.S. (Graham and Harvey, 2001), and the Netherlands, Germany and France, though not in the UK (Brounen et al. 2004).

Confirming our expectations, manufacturing companies used earnings multiple approach (not recommended) less, but also used profitability index (recommended) less, contradicting our expectations. Finally, IRR (not recommended) and discounted pay-back (not recommended) were used less often in 2008 than in 2005. Thus, the use of recommended methods may not have increased, but the use of non-recommended methods seems to have decreased.

6. Summary and Conclusions

We analysed what determined the use of capital budgeting methods in Swedish listed companies in 2005 and 2008. Data on the use of capital budgeting methods were obtained from a survey sent out to all Swedish companies listed on the Stockholm Stock Exchange. The survey is a replica of that used by Graham and Harvey (2001) and Brounen et al. (2004).

Previous studies have found size to be positively correlated with the use of some capital budgeting methods. However, most of these studies were based on descriptive methods such as correlation analysis and independent sample t-tests, which are not sufficient to establish causality. Using multivariate regression analysis, we found that large companies used net present value (recommended), internal rate of return (not recommended), pay-back (not recommended), and sensitivity analysis (recommended) more than small companies.

Other company-specific variables that seemed to influence the choice of method were growth opportunities of the company, leverage, the dividend pay-out ratio, target debt ratio, the degree of management ownership, foreign sales, industry and individual characteristics of the CEO. Our results supported hypotheses that Swedish listed companies have become more sophisticated over the years (or at least less unsophisticated); that companies with greater leverage used payback more; and that companies with stricter debt targets and less management ownership employed ARR more.

Surprisingly, companies with more educated CEOs used non-recommended methods such as IRR and discounted pay-back more than others. Possibly it is the characteristics of the CFO (not the CEO) that influence the choice of capital budgeting methods, which is thus a topic for further study.

The reported use of capital budgeting methods was compared to U.S. and continental European studies. Total use of capital budgeting methods was higher in the U.S. (Graham and Harvey, 2001) and in continental Europe (Brounen et al., 2004) than in Sweden. This is surprising since data only is from listed companies, whereas both non-listed as well as listed companies were included in Graham and Harvey (2001) and Brounen et al. (2004). It can be assumed that listed companies are more sophisticated, gathering more information before making investments, which should mean more extensive use of capital budgeting methods.

Our study measured only reported use of capital budgeting methods, not actual use; i.e., we measured beliefs rather than actions. We cannot be sure what methods were actually used. But our survey nevertheless enabled a broad and rich overview of capital budgeting methods in Sweden, facilitating comparisons between countries and over time.

Notes:

1. The use of capital budgeting method has also been studied in other parts of the world, including Australia (Truong et al., 2008) and Asia (Kester et al., 1999; Kwong, 1986), but not to the same extent.

2. Hermes et al. (2007) is an exception, but was mainly interested in exploring country differences in the use of capital budgeting methods. Silvola (2006) is another exception, but only investigated whether small high-tech companies in Finland used other capital budgeting methods than did small companies in other industries. Finally, Holmén and Pramborg (2009) used logit regression to investigate whether the use of capital budgeting methods for foreign direct investments was related to the political risk in the host country.

3. Hartwig (2012) found a positive correlation between company size and use of the net present value method, with two possible non-causal explanations: (i) the use of a more sophisticated methods such as net present value could lead to better growth opportunities and thus to larger companies; or (ii) an omitted variable, such as CEO education, could cause both better growth opportunities and choice of capital budgeting method.

4. Graham and Harvey (2001) - declared the best paper published in the Journal of Financial Economics in 2001 – is very often referred to in both academic journals and textbooks.

5. The questionnaire also includes questions regarding financing decisions. Those answers are analysed in a separate study.

6. In a few instances, when data was not available from Datastream, it was obtained directly from the company.

7. Investment projects are said to be mutually exclusive if only one could be accepted.

8. In mature companies, a larger portion of the total capital investment budget might consist of reinvestments. Since the business activities to a higher extent are given in a mature company (at least in the short to medium run), one could expect that the number of potential investment projects are fewer.

9. "Real actions" refers to actions that affect cash flows.

10. Calculating accounting rate of return on investments gives an approximate estimate of how accounting ratios (like return on assets) would be affected.

11. The fact that top managers in general do not believe that the capital market is able to see through managed financial statements (Collison et al., 1996; Tzovas, 2006), is probably a contributing factor as to why they focus on accounting numbers.

12. Naturally, we do not know how much political risk companies with foreign sales (which is a proxy for foreign investments) are exposed to. It is, however, probable that companies with a lower proportion of foreign sales/investments, all other things held constant, are exposed to less political risk.

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Appendix 1

The questionnaire (English translation of questions)

Instructions:1) The survey concerns investment- and financing issues that are decided at top management or board level in the parent company/group. This is a top management perspective and the survey questions do not apply to small routine decisions. 2) When questions are asked about investments below, tangible (e.g. properties) as well as intangible (e.g. R&D) and financial investments (e.g. corporate acquisitions) are referred to. The questions regarding investments apply to all non-routine investments decided at top management or board level in the parent company/group.

Please notice: Fill in one (1) square per line.

1. How frequently does your company use the following method/s when deciding which investments to pursue?

NeverAlways

0 1 2 3 4

- a) Net Present Value
- b) Internal Rate of Return
- c) Annuity method
- d) Earnings multiple approach
- e) Adjusted Present Value
- f) Pay back period
- g) Discounted payback period

NeverAlways

0 1 2 3 4

- h) Profitability index
- i) Accounting Rate of Return
- j) Sensitivity Analysis
- k) Value at Risk
- l) We incorporate the "real options" of an investment when evaluating it
- m) Other method/s; namely: _____

2. How frequently does your company use the following discount rate/s when making investments in foreign countries?

To evaluate projects in foreign countries, we use...

<p>Never/Always 0 1 2 3 4</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> a) a discount rate that is normally used for investments in Sweden</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> b) the discount rate for the overseas market (country discount rate)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> c) a divisional discount rate (if the project line of business matches a domestic, i.e. Swedish, division)</p>	<p>Never/Always 0 1 2 3 4</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> d) a risk-matched discount rate for this particular project (considering both country risk and divisional risk)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> e) a different discount rate for each component cashflow that has a different risk characteristic</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> f) other method/s; namely: _____</p>
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3. Does your company estimate the cost of equity? Yes No (If "No", please skip to question 4). If "Yes"; how do you estimate/determine the cost of equity in your company?

<p>Never/Always 0 1 2 3 4</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> a) With average historical returns on common stock</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> b) Using the Capital Asset Pricing Model (CAPM)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> c) Using the CAPM but including some extra "risk Factors"</p>	<p>Never/Always 0 1 2 3 4</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> d) Whatever return our investors tell us they require will determine the cost of equity</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> e) By (political) decisions which regulate the required return</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> f) The cost of equity is deduced from the following equation: Price = Dividends / (cost of equity - Growth)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> g) Other method/s; namely: _____</p>
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4. When valuing an investment, do you adjust either the discount rate and/or the cashflows, for the following risk factors?

<p style="text-align: center;">WE ADJUST</p> <p>discou- cash- both neither ntrate flows</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> a) Risk of unexpected inflation</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> b) Interest rate risk (change in the general level of interest rates)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> c) GDP or business cycle risk</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> d) Term structure risk (change in the long-term vs. short term interest rate)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> e) Commodity price risk</p>	<p style="text-align: center;">WE ADJUST</p> <p>discou- cash- both neither ntrate flows</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> f) Foreign exchange risk</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> g) Distress risk (probability of bankruptcy)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> h) Size (small companies being riskier)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> i) Market value in relation to book value (=Market value of equity + total debt divided by book value of assets)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> j) The recent development of the share price</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> k) Other factor/s; namely: _____</p>
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5. What factors affect your company's choice between short- and long term debt?

<p>Not Very important important 0 1 2 3 4</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> a) We use short term debt when short term interest rates are low compared to long term interest rates</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> b) We match the maturity of our debt with the life of our assets</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> c) We use short-term debt when we expect long-term market interest rates to decline</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> d) We borrow short-term debt so that returns from new investments can be captured more fully by shareholders, rather than committing to pay long-term profits as interest to debtholders</p>	<p>Not Very important important 0 1 2 3 4</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> e) We expect our credit rating to improve, so we borrow short-term until it does</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> f) Borrowing short-term reduces the chance that our company will want to take on risky projects</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> g) We use long-term debt to minimise the risk of having to refinance in "bad times"</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> h) Other factor/s; namely: _____</p>
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6. Has your company considered borrowing money (alternatively issuing debt) in foreign countries? Yes No (If "No", please skip to question 7). If "Yes"; what factors affect such a decision?

<p>Not Very important important 0 1 2 3 4</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> a) Favourable tax treatment relative to Sweden (e.g. different corporate tax rates)</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> b) Keeping the "source of funds" close to the "use of funds"</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> c) Providing a "natural hedge" (e.g. if the foreign currency devalues, we are not obligated to pay the interest in SEK)</p>	<p>Not Very important important 0 1 2 3 4</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> d) Foreign regulations require us to borrow/issue debt abroad</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> e) Foreign interest rates may be lower than Swedish interest rates</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> f) Other factor/s; namely: _____</p>
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7. Has your company considered issuing convertible debt? Yes No (If "No", please skip to question 8). If "Yes"; what factors affect such a decision?

Not important	Very important		Not important	Very important	
0	1 2 3 4		0	1 2 3 4	
<input type="checkbox"/>	<input type="checkbox"/>	a) Convertibles are an inexpensive way to issue "delayed" common stock	<input type="checkbox"/>	<input type="checkbox"/>	e) We want to avoid short-term equity dilution
<input type="checkbox"/>	<input type="checkbox"/>	b) Protecting bondholders against unfavorable actions by managers or stockholders	<input type="checkbox"/>	<input type="checkbox"/>	f) Our stock is currently undervalued
<input type="checkbox"/>	<input type="checkbox"/>	c) Convertibles are less expensive than straight debt	<input type="checkbox"/>	<input type="checkbox"/>	g) The ability to "call" or force conversion of convertible debt if/when we need to
<input type="checkbox"/>	<input type="checkbox"/>	d) Other companies in our industry successfully use convertibles	<input type="checkbox"/>	<input type="checkbox"/>	h) To attract investors who are unsure about the riskiness of our company
			<input type="checkbox"/>	<input type="checkbox"/>	i) Other factor/s; namely: _____

8. Has your company considered issuing shares? Yes No (If "No", please skip to question 9). If "Yes"; what factors affect your company's decision to issue shares?

Not important	Very important		Not important	Very important	
0	1 2 3 4		0	1 2 3 4	
<input type="checkbox"/>	<input type="checkbox"/>	a) If our share price has recently risen, the price at which we can issue is "high"	<input type="checkbox"/>	<input type="checkbox"/>	h) Issuing shares give investors a better impression of our company's prospects than issuing debt
<input type="checkbox"/>	<input type="checkbox"/>	b) Shares are our "least risky" source of funds	<input type="checkbox"/>	<input type="checkbox"/>	i) The capital gain tax rates faced by our investors (relative to tax rates on dividends)
<input type="checkbox"/>	<input type="checkbox"/>	c) Providing shares to employee bonus/stock option plans	<input type="checkbox"/>	<input type="checkbox"/>	j) Diluting the holdings of certain shareholders
<input type="checkbox"/>	<input type="checkbox"/>	d) Shares are our cheapest source of funds	<input type="checkbox"/>	<input type="checkbox"/>	k) The amount by which our share is undervalued or overvalued by the market att behöva ta upp nya lån under dåliga tider
<input type="checkbox"/>	<input type="checkbox"/>	e) Maintaining a target debt-to-equity ratio (or alternatively maintaining the solvency ratio)	<input type="checkbox"/>	<input type="checkbox"/>	l) Inability to obtain funds using debt, convertibles, or other sources
<input type="checkbox"/>	<input type="checkbox"/>	f) Using a similar amount of equity as is used by other companies in our industry	<input type="checkbox"/>	<input type="checkbox"/>	m) Earnings per share dilution
<input type="checkbox"/>	<input type="checkbox"/>	g) Whether our recent profits have been sufficient to fund our activities	<input type="checkbox"/>	<input type="checkbox"/>	o) Other factor/s; namely: _____

9. Does your company have a target range for the solvency (or the debt-to-equity) ratio? Please, choose one of the alternatives.

- No target range
- Yes, a flexible target range (=the aim is that the solvency/debt-to-equity ratio should be within a wide range)
- Yes, a somewhat tight target range (=the aim is that the solvency/debt-to-equity ratio should be within a relatively narrow range)
- Yes, a strict target range (=the aim is that the solvency/debt-to-equity should ratio be at, or very close to, a certain percentage figure)

10. What factors affect how you choose the appropriate amount of debt for you company?

Not important	Very important		Not important	Very important	
0	1 2 3 4		0	1 2 3 4	
<input type="checkbox"/>	<input type="checkbox"/>	a) The tax advantage of interest deductibility	<input type="checkbox"/>	<input type="checkbox"/>	i) We limit debt so our customers/suppliers are not worried about our company going out of business
<input type="checkbox"/>	<input type="checkbox"/>	b) The potential costs of bankruptcy, near bankruptcy or financial distress	<input type="checkbox"/>	<input type="checkbox"/>	j) We try to have enough debt so that we are not an attractive takeover target
<input type="checkbox"/>	<input type="checkbox"/>	c) The debt levels of other companies in our industry	<input type="checkbox"/>	<input type="checkbox"/>	k) If we increase debt our competitors know that we are very unlikely to reduce our output
<input type="checkbox"/>	<input type="checkbox"/>	d) Our credit rating (as assigned by rating agencies)	<input type="checkbox"/>	<input type="checkbox"/>	l) A high debt ratio helps us bargain for concessions from trade unions/our employees
<input type="checkbox"/>	<input type="checkbox"/>	e) The transaction costs and fees for ledning and issuing debt	<input type="checkbox"/>	<input type="checkbox"/>	m) To ensure that upper management works hard and efficiently, we keep a debt level that is sufficiently high (when the debt level is "sufficiently high", a large portion of our cash flow is committed to interest payments)
<input type="checkbox"/>	<input type="checkbox"/>	f) The personal tax costs our investors (=the lenders and the bond holders) face when they receive interest income	<input type="checkbox"/>	<input type="checkbox"/>	n) We restrict our borrowing so that profits from new/future projects can be captured fully by shareholders and do not have to be paid out as interest to debtholders
<input type="checkbox"/>	<input type="checkbox"/>	g) Financial flexibility (we restrict debt so we have enough internal funds available to pursue new projects when they come along)	<input type="checkbox"/>	<input type="checkbox"/>	o) Other factor/s; namely: _____
<input type="checkbox"/>	<input type="checkbox"/>	h) The volatility of our earnings and cash flows			

11. What other factors affect your company's debt policy?

<p>Not important Very important</p> <p>0 1 2 3 4</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> a) We issue debt when our recent profits (internal funds) are not sufficient to fund our activities</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> b) Using debt gives investors a better impression of our company's prospects than issuing new shares</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> c) We borrow/issue bonds when interest rates are particularly low</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> d) We use debt when our equity is undervalued by the market</p>	<p>Not important Very important</p> <p>0 1 2 3 4</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> e) We delay borrowing money/issuing debt because of transaction costs and fees</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> f) We delay retiring debt because of recapitalisation costs and fees</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> g) Changes in the price of our shares</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> h) We borrow money/issue debt when we have accumulated substantial profits</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> i) Other factor/s; namely: _____</p>
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12. Please fill in one square from each category that best describes your company.

Proportion of foreign sales in relation to total revenues	If all options were exercised, what percent of common stock would be owned by the top three officers?	CEO education in business/economics	CEO education in other academic fields	Age of CEO	CEO tenure (time in current job)
<input type="checkbox"/> 0%	<input type="checkbox"/> < 5%	<input type="checkbox"/> < Bachelor	<input type="checkbox"/> < Bachelor	<input type="checkbox"/> < 40 yr	<input type="checkbox"/> < 4 yr
<input type="checkbox"/> 1-24%	<input type="checkbox"/> 5-10%	<input type="checkbox"/> Bachelor	<input type="checkbox"/> Bachelor	<input type="checkbox"/> 40-49 yr	<input type="checkbox"/> 4-9 år yr
<input type="checkbox"/> 24-49%	<input type="checkbox"/> 10-20%	<input type="checkbox"/> Master	<input type="checkbox"/> Master	<input type="checkbox"/> 50-59 yr	<input type="checkbox"/> > 9 år yr
<input type="checkbox"/> ≥ 50%	<input type="checkbox"/> > 20%	<input type="checkbox"/> Licentiate	<input type="checkbox"/> Licentiate	<input type="checkbox"/> ≥ 60 yr	
		<input type="checkbox"/> PhD	<input type="checkbox"/> PhD		

THANK YOU VERY MUCH for completing this survey! Please return the completed survey in the enclosed stamped envelope to us by **JUNE 16**.

Appendix 2

Table A1. Non-response analysis. Probit regression. Dependent variable equals one if the company responded to the survey, otherwise zero

Independent variable	Estimate	z-value
SIZE	6.66e-09**	2.78
LEVERAGE	-0.00092	-0.31
DIVPAY	-0.00029	-0.57
GROWTH	0.00047	0.54
DMAN	0.014	0.12
DYEAR	-0.20*	-1.70
Pseudo R ²	0.02	
Number of obs.	493	

***=significant at the 1% level, **=significant at the 5% level, *=significant at the 10% level.

Appendix 3

Table A2. Pearson correlation coefficients of independent variables used in the empirical analysis

	SIZE	LEVERAGE	GROWTH	TARGET_DEBT	MAN_OWN	CEOEDUC	CEOAGE	CEOTENURE	DMAN	DIVPAY	FSALES	DYEAR
SIZE	1											
LEVERAGE	0,058	1										
GROWTH	0,026	0,026	1									
TARGET_DEBT	-0,038	0,240***	0,197***	1								
MAN_OWN	-0,161**	0,023	-0,049	-0,122	1							
CEOEDUC	0,002	0,077	-0,037	-0,060	0,040	1						
CEOAGE	0,210***	-0,003	0,054	-0,016	0,113	-0,228***	1					
CEOTENURE	-0,006	0,105	-0,064	-0,035	0,426***	-0,150**	0,277***	1				
DMAN	0,112	0,028	0,014	-0,099	-0,048	-0,053	-0,074	0,098	1			
DIVPAY	0,165**	0,046	0,321	0,089	-0,111	0,065	0,045	0,007	0,058	1		
FSALES	0,166	-0,0125	-0,149	-0,129*	0,001	-0,095	0,020	0,118	0,378***	0,026	1	
DYEAR	0,090	0,086	-0,073	-0,002	-0,010	0,480***	-0,118	-0,061	0,035	0,037	-0,111	1

***=significant at the 1% level, **=significant at the 5% level, *=significant at the 1% level.