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Abstract: *The article studies how takeover defenses influence managerial incentives with respect to long term investments, excess liquidity and the amount of debt relative to equity. The article conducts a cross-sectional regression based on a sample of Danish listed firms, dealing explicitly with the problem of causation between the variables. Takeover defenses adopted by Danish firms mainly consist of shares with dual class voting rights often in combination with foundation ownership. The article finds that protected firms have significantly less debt to equity. However, protected firms are not significantly more oriented towards the long-term and do not have significantly more excess liquidity.*

JEL: C31, G32, G34, K22

Keywords: Takeover Defenses, Company Law, Corporate Control, Corporate Governance and Simultaneous Equation Estimation.

Introduction

During the US takeover wave in the eighties management in several firms began to introduce various takeover defenses making it more difficult to conduct a "hostile" takeover and replace the incumbent management. Contrary to Europe, only Britain has witnessed a similar degree of takeover activity as in the US.

This fact reflects a fundamental difference between the Anglo-American and the European corporate governance system although there is a tendency towards convergence. The European Union has attempted to harmonize the legislation towards the Anglo-American principle of "one share–one vote" in order to promote a free market of services and goods, including companies (c.f. the draft of the 5th Directive). Thus, the EU high level group of company law experts recently released a report on issues related to takeover bids (see Winter et al. 2002) seeking to identify various constraints for a well functioning market for corporate control within the EU. It is proposed that when a bidder gains at least 75 percent of a firms capital, he should be able to exercise a proportional percentage of the total votes that can be cast in a general meeting of shareholders.

However, there is little consensus among the European countries regarding this question and the Continental European countries have for example not yet adopted the principle of one share-one vote. As a consequence, management in many European companies is insulated from hostile takeovers since it is protected through various constructions that constitute a breach on the mentioned principle. This includes the use of shares with dual class voting rights, ownership and voting limitations together with foundation ownership which are all present on the Danish stock market. As a result, there is a lower degree of contested takeovers in Denmark compared to the US and Britain. Approximately, a dozen firms have been exposed to "hostile" takeovers" during the last ten years.

This article focuses on how managerial incentives are influenced by the presence of effective takeover defenses, a question that also relates to the debate over whether the EU should promote a market for corporate control in Continental Europe. This is done by testing a number of financial hypotheses of listed Danish firms in which management is effectively protected against takeovers.

The article shows that takeover defenses adopted by Danish firms mainly consist of shares with dual class voting rights often in combination with foundation ownership. The article finds that unprotected firms have significantly more debt to equity (financial leverage) compared to protected firms. One suggestion is that debt may serve as a substitution for takeover defenses. However, protected firms are not more oriented towards long term investments and do not have more excess liquidity compared to unprotected firms. This indicates, that agency costs in relation to Danish managers access to "free cash flow" are low.

The theory about the market for corporate control is primarily based on large and efficient capital markets, such as the US capital market. One therefore might question whether these theories are directly applicable to smaller capital markets such as the Danish capital market. In particular, whether the preconditions for a market for corporate control are fully satisfied in Denmark as well as in other smaller economies. Not only does the legal protection of shareholders differ compared to the US, but there may be other factors constraining the market for a corporate control in Denmark, which imply that unprotected firms are not instantaneously facing a direct threat of a hostile takeover.

The article is organized as follows. The literature is reviewed in the next section followed in section 3 by a description of the hypotheses. Section 4 describes Danish companies use of takeover defenses. Section 5 presents the data and methodology. This is followed by section 6 which presents the results of the single equation models, including robustness. Simultaneous equation estimation is carried out in section 7 dealing explicitly with the problem of causation between the variables. The article ends with a conclusion in section 8.

2. Literature

Proponents of a market for corporate control argue that it serves as a mechanism to solve the principal-agent problem working as an arena in which managers compete for resources to manage (see Jensen and Ruback (1983) and Scharfstein (1988)).

Jensen (1986) suggests that takeovers help some firms to redistribute their excess cash flow to their shareholders instead of keeping it in the firm. According to Jensen, management prefers to have excess cash that may serve as a buffer when projects turn out to have negative net present value (NPV) or to engage in opportunistic behavior (empire building).

Jensen argues that debt may contribute to discipline managers (see also Schleifer and Vishny 1996 for a review). Jensen defines the free cash flow as cash flow in excess of all the projects with positive NPV. Less enthusiastic about the market for corporate control are Franks and Mayer (1990) who recognize that there is a tradeoff. Takeovers may result in a higher level of managerial correction but only at the expense of long-term investment.

Whether takeover defenses are preferable or not is still a controversial question. According to the so-called *shareholder interest hypothesis* takeovers benefit shareholders since target management achieves a better bargaining position to influence the takeover process and thereby extract a higher offer from the bidder on behalf of all target shareholders. Without takeover defenses e.g. stipulated as a fair price provision in the corporate charter there exist incentives for individual shareholders to tender at a lower price than a collusive group could extract from a bidder in an attempt to appropriate the premium associated with a tender offer (see DeAngelo and Rice (1983)).

Schleifer and Vishny (1986) develop a model in which greenmail may benefit shareholders. They argue that the adoption of takeover defenses may encourage some of the bidders to pursue a combination with the target firm since the use of greenmail reduces the number of bidders. Thus, the presence of takeover defenses signals that the target firm does not have access to a white knight.

Stein (1988) formulates a model based on the informational asymmetry between shareholders (including raiders) and management where he shows that takeover defenses benefit shareholders. He argues that signaling behavior by the management becomes important when there is a chance that raiders will exploit temporary mispricings of the stock and therefore buy the firm at a lower price than management regards as fair.

To avoid such a situation management may influence stock prices by inflating earnings, acting in the interest of the (existing) shareholders thereby preventing them from being cheated by raiders. Thus, the shareholder interest hypothesis regards takeover defenses as a long-term employment contracts for incumbent management creating incentives towards taking long-term financial decisions.

In opposition stands the *shareholder entrenchment hypothesis* which argues that takeover defenses are initiated at the expense of the shareholders when incumbent management wants to engages in opportunistic behavior combined with job protection. Takeover defenses therefore insulate management from being part of the managerial labor market wherein alternative teams compete for the rights to manage corporate resources (see Jensen and Ruback (1983)).

Turning to the empirical evidence, various studies examine the reaction of the introduction of different takeover defenses on the share price although with mixed results, whereas the literature is scarce concerning the relationship between takeover defenses and managerial incentives. Bojanic and Officer (1994) conduct a traditional event study to assess the impact on firm value of antitakeover amendments (with mixed results). In addition, they look at accounting profitability measures and find that management of efficiently-run firms may construct takeover barriers to deter value-diminishing takeovers.

Rao and Johnson (1997) use a longitudinal approach to examine the impact of antitakeover amendments on several financial attributes of the firms, including measures of financial leverage, accounting profitability, R & D/sales and capital expenditures/sales. They conclude that antitakeover amendments are not value destroying in terms of their impact on various fundamental firm performance measures. In another study Jonhson and Rao (1999) find that antitakeover charter amendments do not impact either takeover activity or takeover premiums following their adoption.

Mahoney, Sundaramurthy and Mahoney (1997) find that firms adopting antitakeover provisions significantly decrease subsequent long-term investment on an industry-adjusted basis. They analyze changes over the period 1984-88 in three measures of long-term investments after a firm adopts antitakeover provisions: capital expenditures/sales, R & D/sales and the sum of capital

expenditures/sales and R & D/sales. They control for several corporate governance variables, including institutional and insider holdings as well as the proportion of outsiders on corporate boards and separate CEO/chairperson positions. However, they have an insignificant effect on subsequent long-term investment behavior.

Safieddine and Titman (1999) find that firms protected by antitakeover laws substantially reduce their debt and that unprotected firms do the reverse. This suggests that managers in unprotected firms are motivated to take on debt they would otherwise avoid. They argue that higher leverage decreases the probability of a firm being taken over since it commits management in target firms to make improvements and restructuring that a potential raider would do. In this light debt serves as a substitute for takeover defenses and we would expect a lower degree of leverage in protected firms. In addition, Borokhovich, Brunarski and Parrino (1997) look at the relation between antitakeover charter amendments and compensation contracts. They find that antitakeover measures help managers protect above-market levels of compensation.

3. Hypotheses

The articles first two hypotheses relate to whether management in firms, protected against takeovers are more oriented towards *long-term* financial investments. However, finding financial ratios that give unbiased estimates of this question is not a straightforward task. As mentioned, the majority of studies look at how takeover defenses influence changes in R & D expenditures since low R & D costs are associated with short-term incentives. Contrary to both international accounting standards (IAS 9) as well as US and British accounting regulation (SSAP 13 and FAS 2) the Danish Accounting Act does not require firms to report yearly R & D expenditures. Instead, Danish firms may voluntarily report the amount and are free to decide whether the expenditures are going to be written off directly on the income statement or placed under intangible assets and amortized.

Nearly all the firms in the sample have written off the R & D expenses directly on the income statement but only a very few firms actually report the amount in the financial accounts (14%). All prior empirical studies make use of the ratio of R & D to sales as an indication for a firms short or long-term orientation.

Even though SSAP 13, FAS 2 and IAS 9 give some examples of what arrangements are to be classified as R & D expenses, the ratio may be inadequate in a cross-sectional analysis, since management has a high degree of discretion concerning, what and how much to disclose as R & D expenses. As a consequence this article considers the following alternative hypotheses.

H1: *Management in firms that are effectively protected against takeovers have higher* **tangible assets** *to* **total assets** *compared to management in unprotected firms.*

The first hypothesis measures the extent of a firm being engaged in long-term investment projects. According to the Danish Accounting Act tangible assets are assets which are determined for permanent use or ownership by the company, and those which do not fall into the mentioned category are defined as current assets. A high ratio indicates that the firm has devoted a relatively large amount of resources into assets for permanent use instead of investing in current assets that are assumed to be more realizable. However, since securities may be recorded as tangible as well as current assets it has been necessary to remove all securities from the balance sheet. This is because management's decision of whether a security is a tangible or a current asset is up to the incumbent management's discretion which may be manipulated through the choice of accounting valuation principle.

The ratio of tangible assets to total assets may also be given another interpretation, namely as a proxy for *operational risk*. Normally, one defines operational leverage as the ratio of fixed costs to total costs. Firms that have a relatively large fraction of fixed costs would gain considerably by an increase in sales but would at the same time experience a considerable loss when the sales decrease.

Operational leverage is one measure of a firm's total risk. But it is difficult to asses precisely because not all Danish firms report the distribution of costs between fixed and total costs due to chosen accounting principles. Instead, the overall costs are allocated between production, sales and administrative expenses. For this reason financial analysts estimate a firms operational leverage using a correlated proxy. 47 firms in the sample report variable costs in the income statement. The correlation between fixed costs to total costs and tangible assets to total assets is equal to 61. This suggests that tangible assets to total assets serves as a good proxy for a firm's operational leverage.

H2: *Management in firms that are effectively protected against takeovers have higher* **investing activities** *to* **total assets** *compared to management in unprotected firms.*

The financial ratio *investing activities to assets* tries to capture how much management is engaged in long-term investment activities in which management gives up a certain amount of cash today for an uncertain cash flow stream in the future. In order to get a more reliable picture of a given firms investment activities, the nominator in the ratio is obtained from the firms cash flow statement. It represents investment in tangible assets (machines, land and real-estate etc.) as well as cash paid for the acquisition of other firms.

Besides affecting the previously mentioned financial ratios, takeover defenses may also influence the choice of capital structure or financial leverage i.e. the amount of debt relative to equity.

H3: *Management in firms that are effectively protected against takeovers have lower* **debt to equity ratios** *(leverage) compared to management in unprotected firms.*

Jensen (1986) argues that higher leverage may reduce managers' tendency to overinvest compared to what is optimal for shareholders. By issuing debt management commits itself to repay the loans, thereby signaling that

management will reduce the free cash flow. Contrary to debt, this is not the case regarding equity since management is not obliged to pay dividends. One could argue that managers in firms which are not effectively protected against takeovers increase leverage in order to deter potential raiders.

Naturally, the choice of capital structure is not only influenced by management's concern about potential takeovers, but also by more traditional considerations regarding the choice of capital structure. The literature dealing with a firm's choice of capital structure is enormous and the financial theory has proposed several factors that may influence the mix between debt and equity, although empirical studies about the role of takeover defenses are relatively scarce.

The last two hypotheses concern the presence of "excess liquidity" in firms wherein management is protected against takeovers. These hypotheses are based on Jensens Free Cash flow hypothesis, where the free cash flow is defined as cash left to management's disposal after all projects with positive NPV have been initiated. Jensens free cash flow hypothesis argues that a market for corporate control reduces the amount of free cash flow available to management, thereby reducing agency costs. From an economic perspective, all free cash flow should be distributed to the shareholders, who can reinvest the proceeds in firms with profitable investments projects. Free cash flow may be consumed by management as non-pecuniary benefits. Jensen and Meckling (1976) formulate a rational expectation model, where they show that the entrepreneurs consumption of non-pecuniary benefits are borne by himself, since outside investors foresee this consumption. This leads to under investment and therefore a welfare loss for society.

H4: *Management in firms that are effectively protected against takeovers have higher* **cash flow from operations minus investments and dividends** *to* **total assets** *compared to management in unprotected firms.*

The ratio cash flow from operations minus investments and dividends to assets serves as a proxy for "excess liquidity". A high negative ratio indicates that the firm has invested (capital outflow) relatively more than firms with a low negative

ratio e.g. in tangible assets or acquisitions. If on the other hand, the ratio is positive it indicates that management has saved funds and therefore builds financial slack in the form of excess liquidity.

Any excess of cash that is necessary to run the firm's operations (i.e. safety liquidity to pay the future contingent claims) should therefore be paid to the shareholders since the excess liquidity is not invested actively in projects with positive NPV. However, Danish firms have traditionally kept a very low although stable dividend ratio (see Møller and Parum (2001) for a critical discussion of Danish firms dividend policy).

H5: *Management in firms that are effectively protected against takeovers have higher **investments in securities** to **total assets** compared to management in unprotected firms.*

Another indication of the presence of excess cash is when management invests in securities besides what is necessary to control the firms short term cash management activities. This is because it is doubtful whether management may obtain a higher return on its investment in securities compared to what shareholders could receive on their own account. By investing in securities that are negatively correlated with the firm they control, management may obtain a portfolio gain and thereby reduce the risk and increase job security. Tax considerations could also influence whether or not a firm should invest in securities on behalf of shareholders but the Danish tax legislation does not give management such incentives since shareholders' tax burden in the two situations is quite similar.

4. Takeover defenses adopted by Danish firms

The organization of the management in Danish firms differs from the Anglo-American system, in particular by having two-tier boards like Germany. The supervisory board represents the shareholders and monitors the board of managing directors and has the power to decide in cases of extraordinary matters or of major importance (c.f. § 54 in the Company Act).

The supervisory board must not be dominated by the managing directors (c.f. § 51). The members of the supervisory board typically meet once a month and the daily management of the firm is carried out through the board of managing directors.

Table I. *Descriptive statistics of takeover defenses for the sample set of 102 Danish firms listed on the Copenhagen Stock Exchange during 1995-99.*

CATEGORY	Percentage
a) Ownership limitations	2,9
b) Voting rights limitations	4,9
c) Clause of interests	5,9
d) Temporary suspension of voting rights	9,8
e) Shares with dual class voting rights	51,0
f) Right of preemption concerning A-shares	9,8
g) Approval of transfer concerning A-shares	12,7
h) Trust dominants (> 50 % of the votes)	21,6
i) Statutory voting majority, different from 2/3	2,9

Table I shows that Danish firms have adopted takeover defenses that are considerably different from both U.S. and British firms, although they are similar to takeover defenses adopted by other firms located in the EU (see Stonehill and Dullum (1990)). It should be mentioned that the presence of dual class voting rights does not necessarily constitute a takeover defense by itself (c.f. the definition of an effective takeover defense in the end of this section).

Table I contains a description of the most common and applicable takeover defenses accessible to the management in the target firm (see Schans Christensen (1991) for a comparative description of specific defensive devices and

strategies in Danish law and also Rose (2001) for a more detailed legal analysis of potential takeover defenses by Danish firms). Danish takeover defenses are characterized by being permanent. Contrary to the U.S. system they do not become active when a takeover is immediately forthcoming.

Danish takeover defenses are stipulated in the corporate charter or articles of incorporation as shark repellents apart from golden parachutes.

Golden parachutes only play a minor role as an instrument to prevent a takeover by Danish firms, although it is difficult to assess for certain, since golden parachutes are not reported to the public. Golden parachutes for the benefit of the management could constitute a violation of the Company Act on fair treatment and duty of loyalty, if the payment exceed what would be necessary to give the board a fair compensation in the event of removal. It is also dubious how effective golden parachutes are as takeover defenses. One could argue that golden parachutes may actually promote takeovers since they reduce the existing management's resistance towards a takeover in which management is rewarded with golden parachutes.

The first two categories of takeover defenses (a and b) consist of *limitations of ownership and voting rights* which are almost completely absent in the U.S. Even though they are not so widespread in the sample (nearly 8 percent) they are very effective devices in order to insulate the existing management from hostile takeovers. Since the Danish Company Act requires that these arrangements have to be approved at the general meeting by statutory voting majority of 9/10 (c.f. § 79) such agreements would be practically impossible to implement nowadays. They are a legacy from the past very often inspired from the co-operative movement where such provisions were common and ideas concerning corporate governance were almost non-existing.

The term *clause of interest* (c) stipulated in the corporate charter means that shareholders who have agreed to coordinate their votes on a specific matter are regarded as only one shareholder with reference to the number of votes. Such a provision is often stipulated in order to avoid a loophole in ownership and voting limitations.

Almost 6 percent have adopted such a clause and it serves the same purpose as voting and ownership limitations representing a serious restraint in achieving a functioning market for corporate control.

Temporary suspension of voting rights (d) after the acquirer has bought the shares is another device to make a takeover difficult. Nearly 10 percent of Danish firms have adopted such provisions where the suspension typically last one or three months. Since the acquirer has to report his holdings of shares to the company every time he obtains a change of 5 percent of the shares, this gives management the necessary time to implement strategies to protect itself against the takeover. The management could for instance call for an extraordinary general meeting and present proposals that could prevent the acquirer from gaining full control of the firm.

Dual class voting rights (e) are adopted by more than half of the companies and represents a large deviation from of takeover defenses used by U.S. firms. although dual class voting rights are not totally absent in the U.S. (see the SEC Rule 19c-4). Very often a *foundation* or *trust* holds the majority of the A-shares with superior voting rights and blocks for a takeover, while the B-shares are freely traded. The Danish Company Act provides that no shares may bear more than 10 times the voting value of any other share of the same category (c.f. § 67). Whether dual class voting rights should be allowed is still a controversial question (see e.g. Lando (1991) and Niels Chr. Nielsen and Ebbesen (1994)).

The question cannot be viewed independently but must be seen in conjunction with the ownership structure, in particular the extension of trust or foundation ownership, which vary considerably within the EU (besides Denmark, foundation ownership is common in the Netherlands).

In connection with dual class voting rights the corporate charter often states that when one of the existing A-shareholders intends to sell his holdings of A-shares, the other A-shareholders have a *right of preemption* (f) i.e. to buy the shares at a fair price. This is the case for almost 10 percent of the companies. Another possibility is to stipulate in the corporate charter that a *transfer needs approval* (g) of the existing board of supervisors when an A-shareholder wants to sell which is stipulated in almost 13 percent of the firms.

While amendments of a corporation's charter in the U.S. (Delaware) can be conducted by the board of directors on its own, such an action requires the approval of the shareholders on a general meeting which requires 2/3 statutory voting majority (c.f. § 78) according to the Danish Company Act. Only very few companies use the possibility to deviate by increasing the majority fraction from the Companies Acts claim of *statutory voting majority* (i) of 2/3 (3 percent).

One reason might be that such a provision also could prevent the management from changing the corporate charter into other events than a hostile takeover, e.g. when it needs to change its purpose or place of incorporation.

Almost 65 percent of the firms have adopted *White knights* i.e. a right to issue shares at market price without the shareholders right of preemption. The reason for not showing the proportion of white knights in Table I is that it is questionable whether an action to issue shares at market price without the stockholder's right of preemption would be in accordance with the Danish Company Act (see Schans Christensen (1991) p.367). Normally, such a decision would require a statutory voting majority of 2/3 at the general meeting. The law permits that the shareholders can leave the decision and the terms to the management (c.f. § 37). In principle, such an action is possible but as mentioned it could be in conflict with the Danish Company Act (c.f. § 63 and § 80). This is because this action would violate a principle of equality among the shareholders set forth in the Act and thus conflict with the general standard (duty of loyalty) also codified in the Company Act.

The general standard states that management may not pass any resolution which is obviously likely to result in an undue advantage to certain shareholders or third parties at the expense of other shareholders or the company.

Normally, a right to issue shares without the shareholder's right of preemption is not supposed to serve as a takeover defense due to the mentioned considerations. Instead, very often in connection with a "friendly" acquisition, companies use the right to issue shares without the existing shareholder's right of preemption as a measure of payment instead of cash. Such a provision enables management to obtain capital in a flexible manner.

Poison pills are adopted by 5 percent of the firms, but it is also questionable whether the use of a delegation to issue shares lower than market price without *all* the shareholders' right of preemption is possible under Danish law due to the same problems as mentioned above (see Gomard (1989) p.129 as well as Schans Christensen (1991)).

Thus, it is doubtful whether Poison pills or Green mail can be applied under Danish law in a takeover situation since a company can only acquire 10 percent of its own shares. Only under very extreme circumstances i.e. in a limited period if necessary to avoid considerable and threatening damages (c.f. § 48a) it is allowed. Since the shareholders can sell the shares at a high premium this would require a decision at the general meeting that exclusively has the right to approve the dividend (c.f. § 69).

To test the formulated hypotheses empirically, we need to define what we mean by *effective takeover defenses*. This article defines a company to have an efficient takeover defense, denoted by the dummy variable PROTEC, if it satisfies the following characteristics; either the firm has

A) ownership limitations, voting rights limitations or adopted a clause of interest

B) the company is dominated via dual class voting rights by a *foundation (trust)* that holds the voting majority (over 50 percent).

C) the company is also said to be efficiently protected if the A-shares with superior voting rights represent more that 50 percent in a company given that the corporate charter requires the board's approval of transfer or the other A-shareholders have a preemptive right of the A-shares. 30 firms satisfy the above conditions (29 percent).

Table II. Correlation matrix of Danish firms' takeover defenses (binary variables)

	Owner/voting limit.	Appr. of transfer	Preempt. right	Trust ownersh.	Dual class	PROTEC
Owner/voting limit.	1,00					
Appr. of transfer	0,04	1,00				
Preemption right	-0,08	-0,12	1,00			
Trust ownership	-0,16	-0,03	0,08	1,00		
Dual class	-0,25	0,30	0,26	0,31	1,00	
PROTEC	0,39	0,43	0,37	0,21	0,29	1,00

The correlation matrix shows that there is a relatively high positive correlation between dual class voting rights and trust ownership (correlation of 0,31), which illustrates that trust ownership is mainly based on the use of dual class voting rights. Table II further shows that there is a high positive correlation between dual class voting rights and preemption rights as well as approval of transfer.

On the other hand, there is a negative correlation between the latter two (correlation of -0,12), indicating that they substitute each other as legal provisions to avoid contested takeovers in association with dual class voting rights.

Table II also shows that the use of ownership/voting rights limitations is negatively correlated with dual class voting rights, trust ownership and preemption rights, indicating that firms which have adopted ownership/voting rights limitations will tend not to use other types of takeover defenses, since they already are effectively protected against takeovers. As expected, there is a high positive correlation between PROTEC and the other takeover defenses. It is interesting to note that a firm is not necessarily characterized as being protected, solely if it has dual class voting rights (correlation of 0.29). We notice that the EU proposal of one share-one vote will have serious effects on the Danish ownership structure, since the correlation between both trust ownership and dual class voting rights as well as PROTEC and trust ownership is relatively high.

5. Data and methodology

Data consists of all firms listed on the Copenhagen Stock Exchange using observations based on five years average (1995-1999). Banks, insurance companies and mutual funds are excluded since they possess industry specific features and are regulated by specific laws. Moreover, Danish banks, with a very few exemptions, are all very small in terms of market capitalization. They operate locally within a limited geographical area. Often the customers hold the majority of the shares in their local bank, making any "hostile" takeover almost completely impossible.

The few number of shipping companies are left out although it implies that the largest Danish company (Maersk or the A. P. Møller group which is dominated by two foundations) is excluded. The reason is that it is very difficult to get reliable information of the company's financial status due to the non transparent nature of the annual accounts and ownership structure.

A few computer and IT companies are also excluded because they differ from the rest of the sample especially because their annual accounts do not constitute a reliable basis for any of the formulated hypotheses. Approximately half a dozen firms have changed their corporate charter during the period with respect to takeover defenses and are therefore excluded. This leaves us with a sample consisting of 102 companies. See appendix for descriptive statistics and correlation among the variables.

The information sources consist of the companies annual accounts together with the articles of incorporation. To uncover the presence of foundation ownership it has been necessary to use various works of reference since the Danish accounting act does not oblige the company to report the exact holdings of any foundations or other blockholders' number of shares (ownership over 5 percent)..

6.0 Single equation estimates

This section contains the empirical results of the financial hypotheses serving as dependent variables.

Concerning the first hypothesis, table III shows the results of the estimations when the dependent variable is the ratio of tangible assets to total assets. It is interesting to note that the results show that PROTEC is significantly different from zero in all the equations.

Table III: *Regression estimates of **Tangible assets to Total Assets** as the dependent variable with heteroscedasticity-consistent standard errors (see White (1980)). 102 observations based on five year averages (1995-99). The numbers in the parentheses are t-statistics.*

PROTEC: Dummy variable that equals one if the firm is effectively protected against takeovers according to the article's definition of an effective takeover defense, otherwise it equals zero.
LSDEBT: The ratio of long-term debt to short-term debt.
DEBTEQ: The ratio of both long-term and short-term debt to book equity.

Independent variables:	1.	2.	3.
CONSTANT	0.265 (7.306)	0.258 (12.892)	0.309 (14.847)
PROTEC	0.103 (3.063)	0.103 (3.156)	0.096 (2.603)
LSDEBT	0.087 (3.854)	0.088 (3.869)	
DEBTEQ	-0.000 (-0.006)		
Adj. R^2	0.23	0.23	0.10

The regression results seem to provide evidence that firms in which management is effectively protected against takeovers have higher tangible assets compared to firms in which management is not protected against takeovers. This indicates that management in protected firms is relatively more oriented toward long term financial decisions by allocating a higher proportion of resources for a permanent basis. Based on the model, we can therefore not reject the first hypothesis. The first control variable LSDEBT is positive and also significantly different from zero suggesting that firms to a large extent finance their tangible assets by long-term debt instead of borrowing short-term debt. The second control variable DEBTEQ is not significant in either of the equations.

Furthermore, table III indicates that management in protected firms takes a higher degree of risk in terms of operational leverage by having a significantly higher ratio of tangible assets to total assets. One possible explanation is that being protected allows management to take additional risk that it would not otherwise take.

Table IV displays the results of the estimations when the ratio of investing activities to total assets serves as the dependent variable. PROTEC is positive meaning that protected firms on average have received more cash from selling activities than they have spent on investments, although the coefficient is not significantly different from zero in either of the equations. This means that we may reject the second hypothesis.

The first control variable LSDEBT has the expected positive sign since firms tend to finance investing activities with long term debt Even though the coefficient of LSDEBT is positive, it is far from being significantly different from zero. In addition, DEBTEQ measures the effect of leverage on investment activities. Table IV shows that the coefficient is not significantly different from zero either. As a consequence, the model does only explain a relatively low degree of the variation in the ratio of investing activities to total assets (although this is not unusual in cross sectional studies).

Table IV: *Regression estimates of **Investing Activities (without securities) to Total Assets** as the dependent variable with heteroscedasticity-consistent standard errors (see White (1980)). 102 observations based on five year averages (1995-99). The numbers in the parentheses are t-statistics.*

PROTEC: Dummy variable that equals one if the firm is effectively protected against takeovers according to the article's definition of an effective takeover defense, otherwise it equals zero.
LSDEBT: The ratio of long-term debt to short-term debt.
DEBTEQ: The ratio of both long-term and short-term debt to book equity.

Independent variables:	1.	2.	3.
CONSTANT	*-0.653*	*-0,646*	*-0,461*
	(-2.495)	*(-2.470)*	*(-3.712)*
PROTEC	*0.191*	*0.188*	*0.175*
	(1.654)	*(1.611)*	*(1.567)*
LSDEBT	*0.062*	*0.064*	*0.037*
	(0.877)	*(0.910)*	*(0.671)*
DEBTEQ	*0.006*		
	(0.142)		
Adj. R²	*0.13*	*0.13*	*0.06*

The third hypothesis relates takeover defenses to capital structure. Table V displays the results when the ratio of debt to equity is regressed against four variables that have been found to significantly influence leverage (see Rajan and Zingales (1995)).

Notice that the coefficient of PROTEC is negative and even significantly different from zero in all the equations. The four control variables are not significantly different from zero but they have the same sign as found by Rajan and Zingales (1995) although some variables are significantly different from zero on a 10 percent level. This means that one can not reject the third hypothesis since being protected or not has an considerable impact on a firms choice of capital structure.

Table V: *Regression estimates of the ratio of **Debt to Equity** as the dependent variable with heteroscedasticity-consistent standard errors (see White (1980)). 102 observations based on five year averages (1995-99). The numbers in the parentheses are t-statistics.*

DEBTEQ: The ratio of both long-term and short-term debt to book equity.
PROTEC: Dummy variable that equals one if the company is effectively protected against a takeover according to the earlier stated definition of an effective takeover defense, otherwise it is equal to zero.
TANGIBLE: Tangible assets to total assets (securities have been excluded).
ROA: Net income plus interests before tax divided by total book assets.
LNBEME: Natural log of book equity divided by natural log of market equity at the end of the fiscal year.
LNSALES: Natural log of sales.

Independent variables:	1.	2.	3.
CONSTANT	0.743 (1.735)	0.854 (2.404)	1.473 (7.354)
PROTEC	-0.659 (-2.074)	-0.590 (-2.694)	-0.433 (-2.544)
TANGIBLE	0.176 (0.309)		
ROA	-0.028 (-1.918)	-0.028 (-1.855)	
LNBEME	-0.392 (-1.725)	-0.382 (-1.737)	
LNSALES	0.095 (1.860)	0.097 (1.836)	
Adj. R^2	0.25	0.21	0.08

One possible explanation is that managers seek to avoid takeovers by increasing leverage. This is especially relevant for LBO's since a higher degree of financial leverage lowers the probability of a forthcoming LBO. The acquirer may not be able to increase leverage substantially due to the increased risk for financial distress. This is simply because there may not be enough assets to serve as collateral.

Alternatively, managers may prefer to increase leverage instead of introducing takeover defenses since the market may react negatively towards the latter (i.e. substitution effect).

Turning to the last two hypotheses related to Jensen's free cash flow, table VI displays the results when the dependent variable equals the free cash flow to total assets. A firm's cash flow is closely related to the size of the firm, c.f. the firm's position on the Product Life Cycles (PLC) curve. To capture the changes in a firm's cash flow level with size, a new explanatory variable denoted LNSALES (the natural log of sales) has been added in all the equations.

Table VI: *Regression estimates of* **Free Cash Flow to Total Assets** *as the dependent variable with heteroscedasticity-consistent standard errors see (White (1980)). 102 observations based on five year averages (1995-99). The numbers in the parentheses are t-statistics.*

PROTEC: Dummy variable that equals one if the firm is effectively protected against takeovers according to the article's definition of an effective takeover defense, otherwise it equals zero.
LNSALES: The natural log of sales
DEBTEQ: The ratio of both long-term and short-term debt to book equity.

Independent variables:	1.	2.	3.
CONSTANT	0.015 (0.131)	0.054 (2.500)	0.047 (2.399)
PROTEC	0.011 (0.569)	0.005 (0.220)	0.003 (0.116)
DEBTEQ	0.008 (0.851)	0.006 (0.676)	
LNSALES	-0.011 (-0.624)		
Adj. R^2	0.10	0.07	0.03

Notice that PROTEC is positive although the coefficient is not significantly different from zero in any of the equations. The findings do not support the fifth hypothesis since agency costs seem to be low in relation to the free cash flow, meaning that management in protected Danish firms does not opportunistically seek to create a high level of free cash flow (alternatively the model could be mis-specified). Jensen argues that a high degree of debt may reduce management's tendency towards creating free cash flows. But this is not confirmed by the results in table VI since the variable DEBTEQ (which measures the impact of debt on the free cash flow) is not significantly different from zero. This indicates that debt does not reduce agency costs associated with the free cash flow.

Table VII: *Regression estimates of **Investment in securities to Total Assets** as the dependent variable with heteroscedasticity-consistent standard errors (see White (1980)). 102 observations based on five year averages (1995-99). The number in the parentheses are t-statistics.*

PROTEC: Dummy variable that equals one if the firm is effectively protected against takeovers according to the article's definition of an effective takeover defense, otherwise it equals zero.
LNSALES: The natural log of sales.
DEBTEQ: The ratio of both long-term and short-term debt to book equity.

Independent variables:	1.	2.	3.
CONSTANT	-0.004 (-0.018)	-0.072 (-1.021)	-0.024 (-0.511)
PROTEC	-0.055 (-1.540)	-0.051 (-0.952)	-0.036 (-0.758)
DEBTEQ	0.037 (1.523)	0.035 (1.449)	
LNSALES	-0.008 (-0.226)		
Adj. R^2	0.11	0.10	0.04

Table VII shows the result of the estimations when the dependent variable equals cash out flows in Securities to total assets. The coefficient of PROTEC is negative, indicating that protected firms have a higher ratio of investment in securities to assets than unprotected firms, although not significantly.

Table VII further shows that a higher ratio of debt to equity does not have a significant impact on the dependent variable and this is also the case for the second control variable LNSALES.

Adding dummies for industry effects only has a small effect on the obtained results since they have no significant impact on any of the financial ratios. Several studies investigate the influence of e.g. ownership structures upon a firm's financial structure and performance (see Short (1994) for a critical review). To control for the effects caused by large shareholders, all regressions equations have been re-estimated adding two new explanatory variables. The first variable is equal to the sum in percentage of the voting rights held by all shareholders who have more than 5 percent of the votes. To capture the interaction effect between the dummy variable PROTEC and ownership by large shareholders, a second variable has been added that equals the ownership variable multiplied by PROTEC. The ownership variable is in neither of the equations significantly different from zero and this is also the case with the second variable that models the interaction effect. But more importantly, adding two variables to control for ownership effects does not change the significance of the variable PROTEC in any of the equations, including when the dependent variable equals debt to equity. The interpretation is that ownership structures do not significantly influence whether management is oriented towards long or short-term investments, are less leveraged or have any significant excess of cash. (See Voetmann and Neumann (1999) who find that ownership concentration does not influence share price movements on the Danish stock market).

7. Simultaneous estimation analysis

All the previous results rest upon the assumption that the causation runs from whether a firm is effectively protected to the considered financial ratios or not. However, this approach could be biased since one may well argue that the causation could run in the opposite direction i.e. a firms ratio of debt to equity may influence whether management seeks to protect the firm or not. This section therefore analyzes if the level of tangible assets as well as leverage has any significant impact on whether a firm is effectively protected or not.

The problem of causation in empirical studies of corporate governance has within the last years received more attention. For instance, simultaneous structural equation models have been increasingly applied because of the ability to model the causality between ownership and performance (this question should not be confused with exogeneity and the familiar concept of Granger causality in time-series analysis). To address the problem of causality researchers normally use simultaneous equation estimation hereby constructing more than one equation. The system of equations may be estimated e.g. using instrumental variables and two stage least squares conditioned on the equations being identified. However, this approach only works well if there are no dummy variables serving as dependent variables. If this is the case, as in this article,

Heckmann (1978) shows that the results are biased since the residuals of the equations are correlated with some of the independent variables. Heckmann constructs a model which allows consistent estimation and formulates some alternative estimators. Following Heckmann, the model concerning PROTEC's influence on the level of tangible assets may be formulated as a system consisting of two equations.

$$TANGIBLE_i = a_{11i} + \alpha_{12}LSDEBT_i + \alpha_{13}CAPEXP_i + \beta_1 D_i + \gamma_1 PROTEC^*_i + \varepsilon_{1i} \qquad (1)$$

$$PROTEC^*_i = a_{21i} + \alpha_{22}DUALCL_i + \alpha_{23}FOUND_i + \beta_2 D_i + \gamma_2 TANGIBLE_i + \varepsilon_{2i} \qquad (2)$$

The two endogenous variables, $TANGIBLE_i$ and $PROTEC_i$ are supplemented by a set of predetermined variables which in this case consist solely of exogenous variables where the crucial characteristic of the predetermined variables are that they are independent of current and future disturbances. $DUALCL_i$ is a dummy that equals one if firms have shares with dual class voting rights, otherwise it equals zero. $FOUND_i$ is a dummy variable that equals one if a foundation or trust dominates the firm, otherwise it equals zero.

$TANGIBLE_i$ equals the ratio of tangible assets to total assets for firm i. $PROTEC*_i$ is a latent non-dummy variable that measures the protectiveness of the management against a contested takeover. D_i is defined as a dummy variable that equals one if protectiveness exceeds a certain threshold, otherwise zero, according to the categorization in section 4.

$LSDEBT_i$ is identical to the ratio of long to short term debt for firm i. $CAPEXP_i$ equals net capital expenditures to sales for firm i. We notice that the system is identified through exclusions since it obeys the order condition (see Johnston and Dinardo p. 312 (1997)).

The errors ε_i are assumed to satisfy the standard assumptions. Finally, to secure that equations (1) and (2) define a statistic model the principal assumption of Heckmann that $\gamma_2\beta_1 + \beta_2 = 0$ must be made.

Table VIII shows the results of the estimations of the first equation (1) in the system which is the equation of primary interests. In order to estimate the first equation, it must be transformed into expression (1A) in the appendix.

Table VIII: *Regression estimates following Heckmann's (1978) procedure with* **Tangible assets to total assets** *as the dependent variable. 102 observations based on five year averages (1995-99). The numbers in the parentheses are t-statistics.*

Independent variables:	1.	2.	3.
CONSTANT	-0,318 (-1,117)	-0,318 (-1,146)	-0,335 (-1,123)
LSDEBT	-0,003 (-0,028)		
CAPEXP	0,093 (0,016)	0.096 (0,172)	
D	0,087 (0,467)	0,086 (0,478)	0,094 (0,400)
PROTEC*	0,071 (0,188)	0,077 (0,192)	0,080 (0,184)
Adj. R²	0.08	0.08	0.06

Contrary to the previous results c.f. table III, the calculations based on the model developed by Heckman (1978) show that a firm's protectiveness does not significantly influence the level of tangible assets since both variables D and PROTEC* are not significantly different from zero. Both CAPEXP as well as LSDEBT are not significant either. Seeking to incorporate the causation between the variables explicitly therefore alters the results considerably, meaning that we may reject the first hypothesis.

When the dependent variable is DEBTEQ the system may be formulated as:

$$DETBEQ_i = a_{11i} + \alpha_{12}ROA_i + \alpha_{13}SALES_i + \beta_1 D_i + \gamma_1 PROTEC^*_i + \varepsilon_{1i} \qquad (3)$$

$$PROTEC^*_i = a_{21i} + \alpha_{22}DUALCL_i + \alpha_{23}FOUND_i + \beta_2 D_i + \gamma_2 DEBTEQ_i + \varepsilon_{2i} \qquad (4)$$

ROA_i equals return on assets for firm i and *SALES_i* is identical to the natural log of sales for firm i. The system is estimated in exactly the same way as the previous one (see also the appendix table X). Table IX displays the results when the dependent variable is identical to the ratio debt to equity. In this case both variables D and PROTEC* remain significantly different from zero, supporting the findings that whether or not a firm is protected has an impact on its level of debt to equity. Both control variables are not significantly different from zero.

One explanation is that managers in unprotected firms may seek to avoid a possible takeover by increasing debt relative to equity, although other factors may also influence why protected firms have less debt. The results therefore support the findings of Safieddine and Titman (1999) who find that firms protected by antitakeover laws substantially reduce their debt and that unprotected firms do the reverse.

Table VIII: *Regression estimates following Heckmann's (1978) procedure with* **Debt to equity** *as the dependent variable. 102 observations based on five year averages (1995-99). The numbers in the parentheses are t-statistics.*

Independent variables:	1.	2.	3.
CONSTANT	-0,036 (-0,043)	-0,057 (-0,069)	-0,068 (-0,898)
ROA	-0,015 (-0,953)		
LNSALES	0,145 (1,531)	0.125 (1,352)	
D	-0,179 (-1,981)	-0,152 (-1,990)	-0,010 (-1,904)
PROTEC*	-0,889 (-2,027)	-0,875 (-2,211)	-0,838 (-2,106)
Adj. R²	0.16	0.16	0.14

The results may also be given another interpretation, namely that, debt could serve as a kind of bonding mechanism (see Jensen and Meckling 1976). Management in unprotected firms could signal that it does not try to entrench itself by taking more debt than management would do compared to the firms optimal mix between debt and equity.

To summarize, the article shows that unprotected firms have significantly more debt than protected firms, meaning that none of the other hypotheses could be confirmed. However, one may argue that other factors constrain the market for corporate control in Denmark, such that being unprotected does not necessarily mean that a Danish firm is directly exposed to the threat of a takeover bids.

8. Conclusion

The article analyses the relation between takeover defenses and managerial incentives to invest using a sample consisting of listed Danish firms. Several hypotheses are tested in relation to how effective takeover defenses influence whether management is oriented toward long or short term financial investments, holds any "excess" cash flow or prefers to use debt instead of equity. All issues, that cast light on the desirability of the proposal set forth by the EU, including the US/UK inspired principle of one share – one vote.

Takeover defenses adopted by Danish firms consist mainly of shares with dual class voting rights in combination with trust ownership although voting and ownership limitations also are quite common.

The article finds that firms effectively protected against takeovers have a significantly higher degree of financial leverage (debt to equity ratio). It is argued that debt may serve as a substitute for takeover defenses. Specifically, management may refrain from introducing takeover defenses due to a negative reaction from the stock market.

In addition, the article does not find that protected firms are more oriented towards long term investment projects or have more excess cash flow to their disposal compared to unprotected firms. This indicates that agency costs associated with takeover defenses in Danish firms are not severe.

In order to deal with the problem of the causation between the variables an approach formulated by Heckmann (1978) is used which involves simultaneous equation estimation.

However, one should acknowledge that the theory of a market for corporate control, including its effect on managerial incentives, builds on institutional conditions that may not be fully satisfied in Denmark. Whether takeover defenses in general and in particular a market for corporate control are beneficial for European is still an open but very relevant question.

Appendix

Correlation matrix

	PROTEC	TRUSTS	DUALCL	DEBTEQ	CAPEXP	SALES	BEME	ROA	INVEST	TANGI	FCF	SECUR	TURN	LSDEBT
PROTEC	1,00													
TRUSTS	0,21	1,00												
DUALCL	0,29	0,31	1,00											
DEBTEQ	-0,21	-0,02	-0,21	1,00										
CAPEXP	-0,05	-0,05	0,12	0,03	1,00									
SALES	0,14	-0,02	-0,01	0,09	-0,24	1,00								
BEME	-0,14	0,05	0,07	-0,22	0,20	-0,15	1,00							
ROA	-0,03	-0,04	-0,21	-0,06	-0,08	0,20	-0,31	1,00						
INVEST	0,05	0,06	-0,03	0,09	0,47	-0,02	0,06	-0,07	1,00					
TANGI	0,11	0,01	-0,12	0,01	0,04	0,06	0,08	0,03	-0,03	1,00				
FCF	0,00	0,00	0,06	0,10	0,65	-0,08	0,20	-0,02	0,39	0,38	1,00			
SECUR	0,05	0,06	-0,03	0,09	0,47	-0,02	0,06	-0,07	1,00	-0,03	0,39	1,00		
TURN	-0,17	0,08	-0,06	0,18	-0,21	0,14	-0,25	0,07	-0,15	0,12	0,04	-0,15	1,00	
LSDEBT	-0,07	-0,08	-0,18	-0,02	-0,10	0,12	0,09	0,01	0,01	0,01	-0,15	0,01	-0,14	1,00

Descriptive Statistics

	PROTEC	TRUSTS	DUALCL	DEBTEQ	CAPEXP	SALES	BEME
Average	0,29	0,28	0,51	1,16	0,01	6,98	-0,34
Median	0,00	0,00	1,00	1,01	-0,01	6,95	-0,20
Std.deviation	0,46	0,45	0,50	1,25	0,14	1,49	0,86
Sample variance	0,21	0,21	0,25	1,57	0,02	2,22	0,74
Kurtosis	-1,18	-1,08	-2,04	27,76	99,56	-0,35	0,13
Scewness	0,92	0,97	-0,04	2,64	9,92	0,05	-0,54
Minimum	0,00	0,00	0,00	-4,49	-0,08	3,51	-2,49
Maximum	1,00	1,00	1,00	10,00	1,45	10,43	1,54

	ROA	INVEST	TANGI	FCF	SECUR	TURNOVER	LSDEBT
Average	8,88	-0,01	-0,39	-0,02	-0,01	1,27	0,60
Median	8,10	0,00	-0,23	-0,02	0,00	1,20	0,39
Std.deviation	8,15	0,33	0,73	0,15	0,33	0,55	0,97
Sample variance	66,47	0,11	0,53	0,02	0,11	0,30	0,94
Kurtosis	3,82	58,26	35,89	18,03	58,26	1,53	28,83
Scewness	0,98	-5,13	-5,21	2,51	-5,13	0,80	4,93
Minimum	-17,00	-2,84	-5,95	-0,49	-2,84	0,02	0,00
Maximum	41,40	1,58	1,20	0,95	1,58	3,21	7,26

Calculations of estimations

In order to estimate equation (1) and (2) as well as (3) and (4) we start by generating instruments from a probit model with D as the dependent variable with all four predetermined variables as independent variables. Let y_{1i} denote TANGIBLE, respectively DEBTEQ and y^*_{2i} PROTEC*. Next step is to calculate the following expression;

$$\frac{y^*_{2i}}{\omega^{\frac{1}{2}}_{22}} = X_{1i}\hat{\pi}_{21} + X_{2i}\hat{\pi}_{22} \tag{1A}$$

X_{1i} is a 102×2 matrix consisting of observations from the variables LSDEBT and CAPSALES for each firm, respectively ROA and SALES for each firm. X_{2i} is a 102×2 matrix consisting of observations of the variables DUALCL and FOUND. The vectors $\hat{\pi}_{1i}$ and $\hat{\pi}_{2i}$ are equal to the estimates obtained from the probit model of the four variables yielding (-0,0778, -1,5913) and (0.7064, 0.3617). The results of the probit estimates when DEBTEQ is the dependent variable are (0.0006, 0.1454) and (0.7305, 0.3852) respectively.

The denominator in expression (1A), $\omega^{\frac{1}{2}}_{22}$ comes from the reduced form variance and serves to normalize the estimate. To get the fitted values of the probit model, the values in expression (1A) are transformed by the standard normal cumulative density function. Equations (1) and (3) are then estimated by the following expression:

$$y_{1i} = X_{1i}\alpha_1 + \hat{P}_i\beta_1 + \left(\hat{y}^*_{2i}\omega^{-\frac{1}{2}}_{22}\right)\gamma^*_1 + \varepsilon_{1i} + (D_i - \hat{P}_i)\beta_1 + \gamma^*_1(y^*_{2i}\omega^{-\frac{1}{2}}_{22} - \hat{y}^*_{2i}\omega^{-\frac{1}{2}}_{22}), \tag{2A}$$

where $\hat{P}_i$ are the fitted values from the probit. Expression (2A) yields unique consistent estimates of the parameters and where the last three terms are residuals. To get the estimates of equations (2) and (4) we use expression (1b') in Heckmann (1978) page 944 which is equal to:

$$(y_{1i} - \hat{P}\beta_2^*) = -\frac{1}{\gamma_2^*}\left(X_{2i}\alpha_2^* - \left(\hat{y}_{2i}^*\omega_{22}^{-\frac{1}{2}}\right)\right) - \frac{1}{\gamma_2^*}\left(\varepsilon_{2i}\omega_{22}^{-\frac{1}{2}} + \left(D_i - \hat{P}_i\right)\beta_2^* - \left(y_{2i}^*\omega_{22}^{-\frac{1}{2}} - \hat{y}_{2i}^*\omega_{22}^{-\frac{1}{2}}\right)\right) \qquad (3A)$$

The left hand of equation (3A) is denoted δ and the coefficients below are obtained by dividing the regression coefficients by $-\hat{\gamma}_2^*$. The matrix X_{2i} contains a constant and the variables DUALCL and FOUND. The results are shown in table X.

Table X. Estimations of equation 3A

	δTANGI	δDEBTEQ
Constant	1,254 (2,427)	3,817 (0,922)
DUALCL	2,478 (0,857)	1,860 (0.722)
FOUND	5,810 (1,203)	3,007 (0,998)
γ^*_2	-1,084 (0.201)	-0.150 (0.524)
Adj. R²	0.05	0.09

The main purpose in this article is the first equation in both systems whereas the second equations serve more as auxiliary equations to estimate the first one.

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