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# The influence of proprietary disclosure costs on the decision to go public

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The Influence of Proprietary Disclosure Costs on the Decision to Go Public

Theory and Evidence

Teye A. Marra

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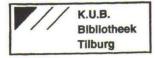
Theory and Evidence

### Proefschrift

ter verkrijging van de graad van doctor aan de Katholieke Universiteit Brabant, op gezag van de rector magnificus, prof. dr. F.A. van der Duyn Schouten, in het openbaar te verdedigen ten overstaan van een door het college voor promoties aangewezen commissie in de aula van de Universiteit op vrijdag 12 januari 2001 om 16.15 uur door

**Teye Age Marra** 

geboren op 2 juli 1967 te Sneek



Promotores: Prof. Dr. P.W. Moerland Prof. Dr. A.H.F. Verboven

# Preface

### "The journey is the destination" (Zen wisdom)

Comparing the realization of a thesis with some kind of journey is probably not uncommon. As with a journey, one usually knows where to start from – a good idea – and where to go to – writing a thesis about it. However, if it is a difficult journey, one does not know whether or how the end will be reached. Now that I have almost reached the end of the journey, I realize that it is not as much the thesis that counts; more important is the journey that led to its completion. It was an intriguing journey.

This thesis is not the work of just one person. Many people have in some way contributed to its realization. In the remainder of this text I want to express my gratitude to the main contributors. First, of course, I want to thank my advisors: Piet Moerland and Adri Verboven. They were the ones who most closely witnessed the realization of this thesis, and they were my main guides. I especially want to thank Piet for offering me so much freedom of movement in developing my thesis topic, and his open attitude towards all the ideas that passed in review through the years. Special gratitude goes to Adri for his more practical comments, which kept me from being to free-floating.

A third person, without whom this thesis would certainly have had a different content, is Jeroen Suijs. He is the co-author of Chapter 4 and has provided important contributions to Chapter 3, including the majority of the figures. I consider myself very lucky that I have met Jeroen during my academic journey, and I am very grateful to him for sharing with me his analytical skills. A special word of thank goes further to Doug DeJong. He has largely contributed to my academic education. Doug has shown me what academic research is all about and actually gave me the opportunity to do it.

I am furthermore indebted to the IOSA-initiative and the CentER Accounting Research Group (CARG), both of Tilburg University, for offering me the opportunity and environment for doing research. I am also indebted to the Financial Management Department of the Faculty of Management and Organization of Groningen University, which gave me the opportunity to complete my thesis.

Furthermore, I want to thank my former colleagues from Tilburg University, who contributed to a large extent to making the almost weekly roundtrip straight through the Netherlands worthwhile. Particularly, I bear in mind the good times I had with Michel van Bremen. He was also the person who started it all by convincing me of my academic potential and persuading me to stay at Tilburg University. I want to thank Roger Coenen for putting his database of Dutch IPO prospectuses at my disposal and for the countless laughs he caused. I thank my colleagues at Groningen University for the pleasant work climate in the last three years, and especially Henk von Eije and Carel Huijgen for their comments on parts of this thesis. I am grateful to Jan Lindenaar for placing at my disposal the set of potential IPO-firms. Also Jessica Bakker is gratefully acknowledged for her improvements in the English usage in this thesis.

I would like to thank the members of my committee, in addition to those already mentioned: Piet Duffhues (Tilburg University), Johan van Helleman (Tilburg University) and Ailsa Röell (Tilburg University and Princeton University), for the approval of this thesis.

Finally, I want to thank Pia for her support and for keeping me from losing sight of the things that really matter in life. I hope I will do a better job as a husband and a father in the future.

Teye Marra

Groningen, november 2000

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# **Chapter 1**

### Introduction

### 1.1 Introduction and motivation

This thesis deals with the relationship between management communication with investors, proprietary information and corporate financing. Ultimately, a firm has to prove its raison d'être on the product market by means of initiating and maintaining value generating investment projects. For the larger firm the financing of these projects is primarily provided by outside investors. The conditions for the provision of outside capital are commonly believed to be positively influenced by the extent to which investors are informed about the performances and prospects of the firm. However, if the communication between the management and outside investors can be overheard by opposing parties, such as product market competitors, who can use the disclosed information to the firm's disadvantage, a propensity to withhold certain investor relevant information may occur. The subject of this thesis is this particular information problem.

More specifically, we will examine whether and how confidentiality concerns may influence firms' financing choice, when management communication with outside investors depends on the source of financing. On the whole, two outside financing sources can be distinguished: public and private capital markets. A distinguishing feature between both capital market types is the possibility to privately communicate with investors. In general, private financing offers the management more scope to communicate in private with investors, which obviously reduces the risk of leaking confidential or proprietary information. On the other hand, public capital markets may incur lower capital costs. Hence, we can represent a firm's financing choice, referring to either public or private financing, by means of a trade-off between disclosure and capital costs.

The most compelling disclosure costs are those related to the detrimental use of investor communications by opposing parties. These costs are in the existing literature also referred to as proprietary disclosure costs. We will focus on the product market competitor, for he is the most common opponent in the disclosure game between managers and outside investors. In

this respect the possible damaging side-effect of investor communication can be referred to as competitor-related proprietary disclosure costs. Other costs related to the firm's financing decision are in this thesis referred to as capital costs. Hence, we will divide a firm's total costs related to the choice of financing either publicly or privately, into two parts: one, including proprietary disclosure costs, and the other, excluding these costs. This division refers in this thesis to a firm's financing costs, and a firm's capital costs, respectively.<sup>1</sup> Overall, the central issue of this thesis can be formulated as whether and how competitor-related proprietary disclosure costs influence a firm's decision to either finance publicly or privately – i.e. to go public or stay private.

The subject of this thesis stems from a motivation to provide evidence for the existence and magnitude of proprietary disclosure costs. It is generally accepted that a larger degree of disclosure mostly results in lower financing costs. However, in common practice full disclosure of all private information never takes place. In the accounting literature, proprietary disclosure costs are considered as a very compelling argument for a firm not to fully disclose its private information. However, empirical evidence to support this common notion is scarce. This thesis aims at providing evidence for the role of proprietary disclosure costs.

If the choice between public or private financing relates to the likelihood of leaking proprietary information, the decision to go public, too, can be considered as a disclosure choice. In that case, staying private can be considered as an attempt to protect proprietary information. However, the notion that opting for private financing may be motivated by proprietary considerations is not commonplace.<sup>2</sup> According to the basic finance literature it appears that the choice between public or private financing is strongly related to a firm's life cycle. Once a company is large and old enough, it more or less naturally evolves from a privately into a publicly financed company. However, many large and old companies in the main European economies are still privately-run companies. In the Netherlands, for example, only about 200 of the approximately 1200 companies that met the formal listing requirements

<sup>&</sup>lt;sup>1</sup> The distinction between financing and capital costs is only made for the sake of clarifying the central issue of this thesis, which is the trade-off between proprietary disclosure costs and other financing costs. Hence, financing costs can be defined as capital costs plus proprietary disclosure costs.

<sup>&</sup>lt;sup>2</sup> Campbell (1979) first pointed out the idea that private (bank) financing may result from a desire for confidentiality. A similar idea has been suggested by Green and Scotchmer (1990), who observe that filing for patent protection entails the disclosure of technical information which may help competitors with their research efforts and, as a result, make innovators reluctant to file for the protection of patenting.

in 1995, were actually listed,<sup>3</sup> while the Dutch public capital market, in particular the Amsterdam Exchanges Stock Exchange,<sup>4</sup> is considered as one of the more developed capital markets on the continent.<sup>5</sup> In comparison with the United States, the public market participation rate in Europe is rather low,<sup>6</sup> although even in the United States not all large and "mature" firms are publicly listed. In fact, during the 1980s the United States experienced a major wave of large and mature firms going private.<sup>7</sup> Hence, we can conclude that going public is not a natural step in the development of all companies. This finding raises the question as to why a firm that is formally qualified for a public listing chooses to stay private. This thesis will analyze if and how the possible leakage of proprietary information to opposing parties, in particular product market competitors,<sup>8</sup> affects the decision to opt for either public or private financing.

Furthermore, by explicitly linking competitor-related proprietary disclosure considerations to the financing choice, this study reconciles financial accounting with the cost of capital. Instead of looking for relations between accounting numbers and market prices in order to infer informativeness and/or value relevance, this thesis investigates the role of financial accounting in the functioning of capital markets from a broader perspective. It focuses more on the environment in which a firm has to communicate with investors relative to the extent to which the management can be discrete in its disclosures. If private capital markets offer more disclosure discretion than public capital markets, privately financed firms may be in a better position to protect their proprietary information. The extent to which privately financed firms, also referred to as private firms,<sup>9</sup> are able to protect their proprietary information more efficiently, will naturally depend on differences in the disclosure rules and the monitoring of these rules which apply to both capital market types. This notion is enforced by the common

<sup>&</sup>lt;sup>3</sup> See Chapter 6 of this thesis.

<sup>&</sup>lt;sup>4</sup> Since 1997 the Amsterdam Stock Exchange ("Amsterdamse Effectenbeurs") has merged with the European Option Exchange ("Europese Optiebeurs) and the Financial Futures Market Amsterdam ("Financiële Termijnmarkt Amsterdam") in order to form the Amsterdam Exchanges. The Amsterdam Stock Exchange is now formally called the Amsterdam Exchanges Stock Exchange ("Amsterdam Exchanges Effectenbeurs").

<sup>&</sup>lt;sup>5</sup> For example, the total market value of domestic shares as percent of GDP is 76% for the Amsterdam Exchanges Stock Exchange, as opposed to 26% and 37% for the main German and French stock exchanges, respectively (Röell, 1996, table 1).

<sup>&</sup>lt;sup>6</sup> The total market value of domestic shares as percent of GDP in the United States (New York Stock Exchange, American Stock Exchange, and NASDAQ), is 76% (Röell, 1996, table 1).

<sup>&</sup>lt;sup>7</sup> See Zingales (1995).

<sup>&</sup>lt;sup>8</sup> The literature studying situations in which there is signaling to the product market and to the capital market, was initiated by Bhattacharya and Ritter (1983).

<sup>&</sup>lt;sup>9</sup> Similarly, publicly financed firms are also referred to as public firms.

criticism of the industrial sector that issuing stricter disclosure rules increases the likelihood of providing competitors with useful information. Moreover, the financing choice issue that is central in this thesis, can be put into an international perspective. It is common knowledge that the extent of accounting flexibility differs across jurisdictions. In this respect, the decision in which country or jurisdiction to list can also be governed by considerations of protecting proprietary information. In a world where there is an ever increasing concentration of capital markets, this issue should not be ignored.

#### **1.2 Demarcation**

This thesis concentrates on examining management communication with outside investors in relation with aspects of corporate finance and product market competition. Management communication is approached from a rather abstract point of view in that we focus is primarily on the discretion or flexibility of the management in disclosing private financial information to investors. Other forms of management communication, like the disclosure of environmental and social information, are disregarded. The discretion of managers in disclosing information is defined as the extent to which managers are free to voluntarily disclose to investors. "Disclosure" is a central concept in the accounting literature and therefore it deserves some further attention. Gibbins, Richardson and Waterhouse (1990) provide a useful definition of disclosure in the context of this thesis. They define disclosure as "any deliberate release of information, whether numerical or qualitative, required or voluntary, or via formal or informal channels."<sup>10</sup> The distinction between required and voluntary disclosure is of particular interest, for it determines the extent of disclosure discretion.

A general feature of virtually all developed countries is the existence of rules governing the dissemination of information by companies. These rules can find their origin in the law or in private regulations. In this respect voluntary disclosure can be defined as "information releases which are not required by laws and regulations" (cf. Lev, 1992). This definition, however, disregards factors that may evoke disclosure that does not emanate from laws and regulations.

<sup>&</sup>lt;sup>10</sup> This notion of disclosure departs from Beaver (1998), who explicitly distinguishes disclosure from the concepts "financial reporting" and "financial accounting". According to Beaver, financial reporting is the most comprehensive concept that can be subdivided into financial accounting and disclosure. We prefer the definition of Gibbins, Richardson and Waterhouse (1990).

For example, a certain disclosure practice may evolve naturally or the management may more or less be forced to disclose certain information, because firms from the same industry are disclosing this information too. Disclosures that are motivated by these reasons are generally not considered as mandatory disclosures. Just from a legal perspective, problems may still occur in defining the concept of voluntary disclosure. This is because firms need not unconditionally follow the disclosure laws and regulations, because of a lack of monitoring or sanctioning policies.<sup>11</sup> And even if a firm can be sanctioned for breaking disclosure rules, the benefits of doing so may exceed the costs. In this respect, noncompliance with disclosure rules, too, may be considered as an act of voluntary (non)disclosure.

Thus, the distinction between voluntary and mandatory disclosure is diffuse, the more so as a common characteristic of disclosure laws and regulations is that they offer a certain latitude. Therefore, managerial disclosure discretion cannot simply be defined as the extent to which disclosure laws and regulations are being followed. Other factors, such as the strictness of disclosure rules and the extent of monitoring, are important too. All these factors, which can be defined as a firm's disclosure environment, jointly determine management's discretion in communicating with investors and the larger the degree of disclosure discretion, the better the management can protect its proprietary information. Therefore, in the context of this thesis managerial disclosure discretion can also be defined as the extent to which a firm can withhold its proprietary information.

A general theme throughout the whole thesis is the trade-off managers face between providing information that is useful to investors for assessing the firm's economic performance and withholding information to maximize the firm's product market advantage. Another and concurrent perspective, however, is the trade-off between providing investors with useful information and withholding information to maximize the personal goals of managers. In this thesis we will primarily focus on the former issue – i.e. the issue of managing proprietary information – for this issue has had little attention in the existing literature. We do not deny possible incentive problems between the management and outside investors and will dedicate attention to it throughout the thesis. However, the emphasis is on the proprietary information problem.

<sup>&</sup>lt;sup>11</sup> The Dutch law even dictates firms to deviate from disclosure standards in order to obtain a true and fair view

Besides management communication with investors, the other two management issues addressed in this thesis – i.e. financing and competition – are elaborated less extensively. With respect to the firm's financing decision we confine ourselves to the decision of placing the firm in a public or private capital market environment, as described in the previous section. Competition is introduced in the analysis by focusing particularly on proprietary disclosure costs that are related to the leakage of confidential information to product market competitors.

#### 1.3 Outline of the thesis

The central issue as introduced in this chapter will be discussed in the five following chapters. First, Chapter 2 will present an overview of the analytical accounting literature on the rationale of discretionary disclosure, i.e. on the rationale why managers of a firm sometimes disclose and other times withhold information. A persuasive argument for discretion in management communication with investors is the occurrence of proprietary disclosure costs. In the subsequent two chapters we will relate the issue of discretionary disclosure with the firm's cost of capital. If proprietary disclosure costs influence the communication of managers with outside investors and capital markets differ in their degree of discretion with regard to disclosures, disclosure considerations are likely to influence capital market choice and consequently the cost of capital. This theme will be explored in Chapter 3, in which different disclosure and financing settings will be elaborated. Chapter 4 presents a comprehensive analytical model of the possible interaction between disclosure and the capital market choice, i.e. the choice between public or private financing. In Chapter 5 we will make a "journey" and discuss the differences in disclosure discretion between private and public capital markets in the Netherlands, and place the Dutch situation in an international perspective by comparing it with other countries, most notably the US. Finally, Chapter 6 investigates the empirical relevance of the notion that proprietary disclosure considerations influence the capital market choice by showing some interesting relations between aspects of product market competition and the incidence of going public.

(see Chapter 5 of this thesis).

# **Chapter 2**

# Review of Analytical Research on Voluntary Corporate Disclosure

### **2.1 Introduction**

Frequently, the parties to an economic transaction are asymmetrically informed. The uneven distribution of information across parties in a transaction may lead to a certain tension that hampers the exchange of goods. Disclosure of information by the better informed to the less informed party may reduce this tension and hence facilitate economic transactions. This is the setting in which the disclosure models that are presented in this chapter are embedded and which provides an economic rationale for the disclosure activities we observe in practice.

#### 2.2 The disclosure principle

Once a difference in preferences for a good is established, a reason for exchange is created. If, however, one party (usually assumed to be the seller) is better informed than the other (the buyer), difficulties may arise which reduce the possibility of exchange. Credible disclosure is a solution to level the information asymmetry barrier. One of the first papers that investigated the problems that may arise when the two parties involved in a transaction are unevenly provided with information, is the seminal paper by Akerlof (1970). Akerlof shows what happens to a market when no credible disclosures about the quality of the offered product can be made: such a market will break down. This famous finding is referred to in the literature as the "market for lemons" problem and the intuition behind it can be explained as follows.

A lemon is a used car of dubious quality. Parties interested in buying a used car do not want to get a lemon, i.e. they do not want to buy a pig in a poke. The seller is assumed to know more about cars than the buyer does. In fact, he is assumed to know the exact quality. If he cannot provide a credible statement about the quality of the car he wants to sell,<sup>1</sup> buyers may expect that at every price they are prepared to pay, they will only get offered cars of matching

<sup>&</sup>lt;sup>1</sup> It may, for example, be too expensive to make a credible statement.

or lower quality.<sup>2</sup> Therefore, buyers should pay a price that reflects the average quality of all the cars that may be offered. However, at this price sellers with cars of above-average quality will withdraw from the market. This pricing and withdrawal process continues till eventually only cars of the lowest possible quality, i.e. the lemons, may be traded. This process is referred to as a market break-down. Thus, if a seller cannot convince a (potential) buyer of the quality of the product he is offering (i.e. if he cannot convince the buyer that he is not buying a pig in a poke), he cannot trade for a price that is higher than the lowest quality price. In such a situation there is a natural incentive for all sellers with a product of a quality higher than the lowest quality to seek for mechanisms that can credibly signal product quality.

The paper by Akerlof is an extreme example of the possible detrimental effect to markets when information is unevenly distributed among parties. If Akerlof's model is right, it implies that sellers have an incentive to look for means to communicate their private information in a credible way (and that such means must exist, otherwise no market transactions apart from the worst possible transactions can be observed in reality). Different streams of literature emerged around this idea: how to communicate credibly in order to overcome market break-down. One of these streams focuses on disclosure as a means to overcome the information asymmetry problem.<sup>3</sup>

The papers by Grossman (1981) and Milgrom (1981)<sup>4</sup> are generally seen as the initiators of the stream of literature that focuses on disclosure as a means to overcome information asymmetry. The paper by Akerlof shows why one could have an incentive to disclose, namely to try to communicate private information to facilitate trading. Grossman and Milgrom gave an answer to the next question: how to disclose. In their papers they demonstrate that if credible disclosures can be made costlessly and the market knows the seller to have private information, full disclosure will emerge. Thus, if there is a costless device that lends credibility to dis-

 $<sup>^2</sup>$  This expected behavior assumes selfishness on the part of the sellers; they do not want to receive too low a price for their product and they are even prepared to defraud the other party. On the other hand, buyers are assumed to act selfishly too, in that they do not want to pay too much. Assuming selfishness on the part of market parties is one of the neoclassical paradigms.

<sup>&</sup>lt;sup>3</sup> Other streams are the signaling, warrantees, and reputation literature. Some controversy exists with respect to the differences between signaling and disclosure models, dating at least back to a discussion by Leland (1981) of Grossman's (1981) paper. To our mind the main difference between the two research frameworks is that disclosure models allow for more direct and precise communication of private information and therefore do more justice to the existent financial reporting apparatus. Although one can claim that accounting is not perfect, it is hard to believe that firms would generally prefer to communicate with investors via much coarser means, like dividend and financing policies.

closures, the market for used cars in Akerlof (1970) could be prevented from breaking down. All sellers would communicate the true quality of their cars and all cars would sell at the appropriate price (i.e. the price that matches real quality).

The ratio behind the Grossman/Milgrom result, which has become known as the disclosure principle (see Dye (1985a)), is similar to that of Akerlof. In Akerlof's paper there is no way in which sellers can communicate their private information, and as a result all sellers, except for the worst one(s), will be driven out of the market. Grossman/Milgrom approach the information problem from the other extreme: they assume that there exists a costless way to fully reveal one's private information.<sup>5</sup> If credible disclosure were costless in Akerlof's lemon example, all sellers would disclose the true quality of their cars. The reasoning behind this conjecture is as follows. If uninformed buyers are willing to pay a price that corresponds with the average quality of all goods that are offered for sale,<sup>6</sup> above-average sellers have an incentive to disclose their private information to get an above-average price. Once the aboveaverage sellers have made themselves known, buyers are no longer willing to pay the a priori average price. This price is now shifted downwards to the price that corresponds with the average of all goods of the sellers that remain silent. Again, all above-average sellers will reveal the true quality of their cars to receive a higher price, and the price offered to the remaining silent sellers will be lowered. This unraveling process will go on until the seller with the worst but one quality will make himself known. Therefore, the process in both models is more or less the same. In Akerlof the market breaks down since credible disclosure is not possible. If, on the other hand, credible disclosure is possible, as it is in Grossman/Milgrom, each seller that were to withdraw from the market in Akerlof's model, now prefers disclosure. Hence, full disclosure emerges instead of a market breakdown.

The notion of the existence of a device that could render full credibility to the disclosures of better informed parties has been well received in the accounting literature. As Admati and

<sup>&</sup>lt;sup>4</sup> See also Ross (1979).

<sup>&</sup>lt;sup>5</sup> Furthermore, Grossman/Milgrom use sequential equilibria as a solution mechanism in their models. Sequential equilibria require that beliefs of individuals are also specified in instances that will not occur in equilibrium ("off-the-equilibrium-path" beliefs). This means that when a full disclosure strategy is played, one must also specify the beliefs in case nondisclosure would be observed. Thus, if full disclosure is a sequential equilibrium, the beliefs when observing nondisclosure must be such that each firm prefers disclosure to nondisclosure. The only beliefs that satisfy this requirement, are skeptical beliefs, i.e. the buyer believes that a seller that does not disclose possesses the worst possible information. Milgrom and Roberts (1986) call this behavior *sophisticated* skeptical, where sophisticated refers to the ability of game-theoretic reasoning.

<sup>&</sup>lt;sup>6</sup> This behavior is generally assumed to be rational.

Pfleiderer (1998, p. 4) put it: "Truthful disclosure is a reasonable assumption since in many jurisdictions there are rigorously enforced anti-fraud laws and shareholders and others are often given the right to sue to recover damages brought about by misrepresentations in disclosed information. In addition, disclosures are often made by third parties, such as accounting firms, which are not directly affected by the content of the disclosure and for whom the reputation for truthfulness is extremely valuable." The assumption of truthful disclosure underlying Grossman/Milgrom has accordingly become known as the "anti-fraud rule". The models by Grossman and Milgrom have initiated a line of research in accounting which addresses the disclosure issue from a corporate perspective and in which an explanation is sought for the observation that firms do *not* seem to strictly follow a strategy of fully revealing their private information, as is implied by the Grossman/Milgrom-model.<sup>7</sup>

#### 2.3 Costly disclosures

A first strand of literature that tries to link the theory of Grossman/Milgrom to the findings from empirical work that managers exercise discretion in disclosing information, has emanated from the work of Janovic (1982) and Verrecchia (1983). In both papers the assumption of costless disclosure is relaxed and it is shown that this amendment to the basic theory can prevent the full unraveling of all private information. The intuition underlying this result is that a cost related to truthful disclosure introduces noise into the basic disclosure model by delivering an alternative interpretation of the withholding of private information. In addition to the existent interpretation that silence means bad news (i.e. the worst possible news), the withholding of private information can now also be explained as the private information being not good enough to overcome the cost of disclosing it. Hence, rational buyers can no longer (as in Grossman/Milgrom) infer the worst from a nondisclosing seller to force all sellers to show their true identity. Since a buyer cannot distinguish between nondisclosing sellers, he will offer the same price to all silent sellers and because the reason for silence may also stem from too high a disclosure cost, this price cannot be the worst possible price as in Akerlof's model.

<sup>&</sup>lt;sup>7</sup> Another line of research that originated from the Grossman/Milgrom studies and that looks like the one that is the subject of the remainder of this chapter, investigates why we observe mandated disclosure as firms are willing to fully disclose voluntarily. This research focuses on the social value of disclosure regulation. See Fishman and Hagerty (1997) for an overview of this stream of research.

To get a clearer insight in the role of a disclosure cost in the formulation of a theory of disclosure, the model of Verrecchia is considered more closely. Verrecchia sketches an information problem between a manager of a risky asset (say a firm) endowed with private information, and a large number of traders who hold shares of the risky asset and whose expectations determine a price for this asset. The information asymmetry between the manager and the traders of the shares of the risky asset concentrates on one piece of private information: the true liquidating value of the risky asset. All traders know that the manager has this private information and in principle all are eager to receive this information to form a better judgement on the share price. The manager is assumed to maximize the price of the risky asset, which conditions his willingness to release the private information.<sup>8</sup> Furthermore, only truthful disclosures are allowed. If there were no costs of disclosure, this setting would not be substantially different from the one described in Grossman/Milgrom and the manager would always disclose his information. However, if all disclosures were to reduce the value of the risky asset by some cost whereas nondisclosure would not, there would be instances in which the manager would be better off by withholding his information. These instances are when the manager has information that once released does not make up for the reduction of value of the risky asset, which is in fact the disclosure cost. Thus, the cost of disclosure outweighs the benefits. The benefits stem from the usual adverse selection argument that revealing ones true type removes the undervaluation caused by a pooling with types of lower quality. This truthtelling mechanism will stop working, however, if the reduction in undervaluation does not make up for the cost of disclosure. At such point it is no longer rationale for sophisticated traders to force managers to reveal their private information by suppressing the price further. Consequently, a threshold for disclosure is established.

Verrecchia shows the circumstances under which there is a unique disclosure equilibrium. A salient feature of this equilibrium is that it has only one threshold value, marking the lowest value of private information that the manager is willing to disclose. A necessary condition for this equilibrium to exist is that the manager maximizes the share price for all possible realiza-

<sup>&</sup>lt;sup>8</sup> The assumption that managers maximize the current value of the firm neglects possible agency problems. For example, a manager can be more interested in the future performance of the firm, perhaps so because the present results are mainly achieved under the responsibility of his predecessor. On the other hand, a manager may even be assumed to minimize the current value of the firm, to ensure positive price reactions in the future (see Verrecchia 2000, footnote 27). A reason for managers to be concerned with the current value of the firm is that they may be rewarded on the basis of it. Also, current firm value is important when the firm wants to sell equity or debt securities to the market. In Chapter 3 and 4 of this thesis this latter rationale for disclosure is used to explain the influence of proprietary disclosure costs on firms' openness and financing method.

tions of private information, both those below and those above the threshold value. This means that for every possible piece of private information, the manager has to compare the market price for its risky asset in case he discloses with the price in case he withholds this information, taking into account the expectations of the "price-making" traders. Possible disclosure equilibria in Verrecchia range from full to partial to nondisclosure, depending on the height of the disclosure cost. In the extreme cases of no cost and a "sky-high" disclosure cost, there will be an equilibrium of full disclosure and full nondisclosure, respectively. For all disclosure costs in between, the manager can exercise discretion in the disclosure of information. The measure of discretion is positively associated with the height of the disclosure cost, because the higher the cost, the greater the range of possible values of private information about which the managers can remain silent.

Applied to the disclosure act of the firm Verrecchia's model was the first to give an explanation as to why we do not observe something like full corporate disclosure.<sup>9</sup> In addition it shows what we could observe in a world as the one defined by Grossman/Milgrom with a direct and constant cost of disclosure.<sup>10</sup> Instead of a full disclosure equilibrium, partial disclosure equilibria can emerge in which information above a certain threshold value is disclosed and information below the threshold is withheld. The interesting question from an empirical point of view is, of course, what the nature of the threshold for disclosure would be. As Verrecchia points out, it would be natural to think of the threshold in his model as being determined by the cost of preparing and disseminating information, for these costs are rather fixed and only occur with actual disclosure. However, he also wants us to include in this cost the much more appealing and intangible cost associated with the detrimental use of the message by third parties. For example, a product market competitor may use the manager's message in his production or entry decision, or employees may use the message in determining their wage claims. This type of disclosure cost is referred to as a proprietary disclosure cost.

<sup>&</sup>lt;sup>9</sup> The same conjecture could be inferred from Janovic (1982). However, because Janovic's paper is not directly addressed to corporate decision-making and accounting (but instead focuses on the social value of disclosure policies), the paper with the lowest seniority is taken as an example.

<sup>&</sup>lt;sup>10</sup> Verrecchia (1983) also devotes some attention to the case of a variable disclosure cost depending upon the nature of the private information. This issue, however, is explored more thoroughly in the game theoretical disclosure models which are the subject of the next section.

If the constant direct disclosure cost introduced in Verrecchia's model can be perceived as predominantly proprietary in nature, it provides the following interesting empirical interpretation. If firms in more competitive industries face higher proprietary costs of disclosure, they will disclose less because capital market investors will respond less negatively to nondisclosure. Investors realize the material threat of the proprietary cost that might decrease the value of the firm and thus the value of their claims even further.

Now that a counter-argument to the full disclosure principle had been introduced in the form of a disclosure cost, disclosure models in accounting gave some support to the notion that corporate disclosure is more than just the dissemination of all value relevant information. However, the way in which Verrecchia presents the disclosure cost, namely as a constant and direct cost, did raise some questions. Obviously, it can not be denied that the costs associated with the preparation and dissemination of information have a fixed character and that these costs are directly linked to the act of disclosure. However, disclosure costs with a proprietary nature, which are generally considered to be a more important source of disclosure cost, do not fit the representation of a constant and direct cost well. "It is, at best, a convenient stylized assumption" (Verrecchia, 1990a, p. 248). This type of cost is more likely to depend on the specific contents of the private information. Disclosure per se does not necessarily lead to the most material cost; it is the possible adverse use of the message that is of more interest. For example, a firm with very positive information regarding the prospects of its new investment opportunity might be unresponsive in disclosing this information to outside investors if its product market competitors are able to overhear the message. On the other hand, if the firm has nothing spectacular to report it can probably give full disclosure without having to be concerned about a detrimental use of the message by competitors. Reversely, if the firm has bad news about the prospects of its newly acquired investment project, it may want to disclose the news in order to prevent its competitors from counteracting its product market movements. A possible negative reaction by shareholders, however, may prevent the firm from disclosing. Thus, disclosures may be both indirectly and directly costly, and the former source of disclosure costs could be considerably higher than the latter. This concern with the model of Verrecchia has led to a number of extensions in which disclosure costs are endogenized, which will be the topic of the next section.

#### 2.4 Endogenous disclosure cost

The incorporation of indirect disclosure costs in the accounting disclosure models was introduced in the literature by two papers that were published at about the same time. In 1990 a study by Darrough and Stoughton and a couple of months later a study by Wagenhofer was published which both tackled the main problem of Verrecchia's model, namely the passive way in which proprietary disclosure costs were represented. Although both studies have much in common regarding their intuition and the representation of the disclosure problem, Wagenhofer's model is richer (in that it considers a larger array of possible private information) and fits more nicely into the overall development of the discretionary disclosure theory (in that it emphasizes the power of the basic unraveling theorem; in fact, this equilibrium cannot be ruled out by the model). Therefore, the subsequent discussion will predominantly focus on Wagenhofer's work.

Wagenhofer incorporated the disclosure cost by introducing a second audience in the firm's disclosure environment with countervailing interests to the firm's disclosures. This third party in the disclosure game, e.g. a product market competitor, could impose a cost on the firm, depending on the content of the firm's message or its beliefs about the nature of the private information if nondisclosure were observed. Hence, the firm in Wagenhofer's model is faced with the following dilemma: it wants to signal good information to the capital market to distinguish itself from bad firms, but at the same time it wants to withhold this information of an inferior quality, the firm's disclosure incentives are turned around: it wants to withhold this information from the capital market in the hope that it gets pooled with better firms, but it may want to disclose to withhold the third party from undertaking a detrimental action. Ideally, the firm wants to disclose good information exclusively to the third party. This possibility, however, is excluded from the model, since Wagenhofer assumes that the firm is a publicly listed firm and therefore can only communicate publicly with its investors.<sup>11</sup>

The third party, subverting the firm's relationship with its outside capital suppliers, may represent various parties which may determine the firm's proprietary disclosure cost. A natural candidate is an existent or potential product market competitor that may let its production or entry decision depend on the disclosures of its rival. Other candidates may be labor unions that may demand higher wages after receiving good information on the firm's prospects, or government agencies that want to extract a higher part of the firm's good fortune for social purposes. The more favorable the disclosure, the higher the possible price investors are willing to pay for the firm's shares, but at the same time the higher the impact of the possible adverse action by a rival may be. Hence, the disclosing firm is faced with the problem of balancing these effects in assessing its optimal disclosure strategy.

The main contribution of Wagenhofer's model to the disclosure literature is the way in which it represents the influence of proprietary disclosure costs on the disclosure decision. The disclosure cost in his model takes the form of a probable detrimental action of a second audience, where the probability of such an action is represented as the outcome of an optimal choice by the second audience. Thus, the model underscores the more prominent role disclosure costs are believed to play in corporate disclosure practice. Essentially, the model is a lot like its main predecessor: Verrecchia's model. In this model the main problem is also the trade-off between disclosure benefits and costs. However, the costs in Verrecchia are modeled as a passive, dead weight hurdle rate that has to be taken before the voluntary disclosure of private information can be interesting to the firm. Wagenhofer presents the disclosure cost as an indirect constant cost that may or may not be imposed by an active opponent in the corporate disclosure game.

Before we turn to the empirical implications of Wagenhofer's model, a more detailed introduction of his model is given. As has become clear from the former discussion, three main parties are distinguished. First, the firm or the decision makers within the firm; second and third, two parties interested in the firm's public messages: a group of unanimous investors, referred to as the financial market, and a potential product market entrant. All parties in the model are assumed to be risk-neutral, which is usual in the accounting disclosure models.<sup>12</sup> These three parties play a disclosure game, which starts with the private revelation of information to the firm about one particular item: the firm's intrinsic value. Then the firm has to decide what to do with this (fully revealing) piece of private information on its value. It is

<sup>&</sup>lt;sup>11</sup> In Chapter 4 the consequences of allowing for private, selective disclosure in this disclosure game are explored.

<sup>&</sup>lt;sup>12</sup> This assumption could be motivated by an additional assumption that the current equity holders are welldiversified investors and the risks are diversifiable (Feltham and Xie, 1992, footnote 2).

granted two options: disclose this information truthfully or withhold it. Hence, the firm is not allowed to lie, making the model part of the group of disclosure models referred to as antifraud rule models. The firm is further assumed to base its disclosure action on the objective of maximizing its current share price.<sup>13,14</sup> Without the potential rival and without any disclosure cost, the disclosure problem would be reduced to the one studied in Grossman/Milgrom and hence full disclosure of all private information would occur. However, the rival may impose a cost on the firm, namely if the firm's disclosure is above a certain value or, if the firm does not disclose, the rival believes that the private information exceeds this value. In the model the cost imposed by the rival is referred to as a proprietary cost and the value above which the rival imposes this cost as the threshold value of disclosure. Both the proprietary cost and the threshold value are exogenous to the model.<sup>15</sup>

A general result of Wagenhofer's model is that the full revelation of all private information, as in Grossman/Milgrom, can never be ruled out. Thus, even with indirect disclosure costs full disclosure can occur.<sup>16</sup> This finding can be understood in those instances where the response

<sup>&</sup>lt;sup>13</sup> Wagenhofer does not elaborate on this assumption. He does not, for example, explicitly assume that the firm needs to sell shares to finance its value generating investment plans, as Darrough and Stoughton do. He implicitly refers to the general postulation regarding the ultimate goal of the firm, namely to maximize current shareholder value, which in an efficient and perfect market is the same as striving for an as high as possible current share price. However, the financial market considered in Wagenhofer, like in all disclosure models, is not assumed to be fully efficient. Instead, it can be stated that these type of models investigate the process underlying market efficiency in that they study the firm's decision to share its private value relevant information with the market. As the model of Wagenhofer (and that of Verrecchia) shows, it can be in the interest of the firm to not always reveal its private value relevant information can be costly means that the markets studied in these models are not perfect - a necessary condition for market efficiency. Another critical assumption of the model (in most of the disclosure models) is the exclusion of a possible conflict of interest between managers and (initial) owners of the firm. The outcomes of the model may chance (namely) if the utility function of both parties is not the same (Wagenhofer, 1990, footnote 3).

<sup>&</sup>lt;sup>14</sup> Many papers in the accounting and finance literature assume that the informed firm seeks to maximize the current market value of its equity capital. However, alternative objectives can be stated. Darrough and Stoughton (1990) and Feltham and Xie (1992), for example, assume that the firm wants to maximize the expected end of period cash flow to its initial shareholders. Other papers, like Miller and Rock (1985), have included both objectives by taking a weighted average of the two. See also footnote 8.

<sup>&</sup>lt;sup>15</sup> In contrast, Darrough and Stoughton model the role of the rival in the disclosure game more sophisticated in that he may challenge the incumbent firm to play a Cournot-Nash duopoly game. The cost of entry in this disclosure model is represented by the reduction in profits of the incumbent firm when the rival enters its product market. The threshold for entry is, as in Wagenhofer, exogenous to the model.

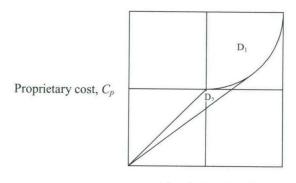
<sup>&</sup>lt;sup>16</sup> An interesting extension of Wagenhofer's disclosure model is the model by Feltham and Xie (1992). Feltham and Xie extend the Wagenhofer study by allowing for cases where the threshold value for entry is not common knowledge. Further, they consider variable entry costs and take into account the possible effect of an alternative financing source: (riskless) public debt. Their results show that in contrast to Wagenhofer's model there need not always be a full disclosure equilibrium. In fact, if entry costs are variable and small amounts of capital are needed, a full disclosure equilibrium cannot exist in their model. In addition, Feltham and Xie show that there is always a partial disclosure equilibrium if there is no full disclosure equilibrium. Therefore, like in Wagenhofer, a

of one of the parties to the firm's disclosures dominates the other. If, for example, both the proprietary cost and the probability this cost is imposed (i.e., a low threshold value) are very high, the firm is predominantly interested in influencing the beliefs of its rival. However, the capital market as well as the rival recognize this situation. Hence, the firm cannot use the proprietary cost threat to be silent and full disclosure will be obtained. This argument also holds the other way around. If the proprietary cost as well as the chance of entry are very low, the firm's main concern will be its relationship with the capital market. Consequently, the disclosure game is reduced to a two-player (almost) costless disclosure game with only one rational outcome: full disclosure. Only in those cases where the firm has a relatively balanced concern for the response of both audiences, a partial disclosure equilibrium might exist.

Partial disclosure equilibria in Wagenhofer can take on two forms. First, there is a partial equilibrium in which only private information of average quality is disclosed. Second, there can be a partial equilibrium in which apart from average information the best information is also disclosed.<sup>17</sup> Typical of both of these equilibria is that they have two and only two distinct ranges of information about which the firm prefers to be silent. This salient feature of the model reflects the balancing argument underlying the reason of existence of a partial disclosure equilibrium. Thus, compared with the model of Verrecchia, where there is only one nondisclosure interval that contains the worst information, Wagenhofer predicts in certain cases the existence of another nondisclosure interval, containing the best information (except the very best information in the second of the two types of partial disclosure equilibria). The model thus provides us with a reason why even firms with very good information can be reluctant to disclose. Figure 2.1 depicts for what values of the proprietary cost and the threshold value a partial disclosure equilibrium may exist. The figure shows that opportunities for partial disclosure only occur for relatively high proprietary costs and threshold values (see the area indicated by  $D_1$ ) or when both variables are more or less as important to the firm (see the area indicated by D2). Outside these areas only full disclosure equilibria can occur.

nondisclosure equilibrium does not occur, but contrary to Wagenhofer's model a partial disclosure equilibrium can occur in isolation.

<sup>&</sup>lt;sup>17</sup> The former partial disclosure equilibrium is illustrated in Figure 2.2.



Threshold value, K

### Figure 2.1: Possible disclosure strategies from Wagenhofer (1990)<sup>18</sup>

A problem with the model is that in all the instances in which a partial disclosure equilibrium is viable, a full disclosure equilibrium is too. In fact, the full disclosure equilibrium cannot be ruled out by the model, which makes it difficult to predict the existence of a partial disclosure equilibrium in those cases where it might be played. Wagenhofer, however, argues that since partial disclosure strategies are preferred by the firm and are limiting results of a learning process, one can expect the partial disclosure equilibrium to dominate the full disclosure equilibrium under circumstances where both types of equilibria can exist (Wagenhofer, 1990, p. 358).<sup>19</sup>

Despite the elegance with which Wagenhofer models the disclosure decision of the firm, the question remains as to how real his disclosure world is. The notion of the model that disclosure is actually a tradeoff between benefits and costs and that this tradeoff can lead to an outcome in which not all relevant information is revealed, seems rather plausible. That these cost are not just directly linked to the disclosure act but might also have an indirect nature is very plausible too. Further, if one is willing to accept that this indirect or proprietary nature of the disclosure cost is the most intriguing and potentially most harmful cost, the model has

<sup>&</sup>lt;sup>18</sup> This figure is derived from Wagenhofer (1990). The figure is based on a specific example that is discussed in Section 3.3 of the paper. The area indicated by  $D_1$  represents combinations of  $C_p$  and K for which partial disclosure equilibria with only one disclosure interval exist. Area  $D_2$  includes all partial disclosure equilibria for which two distinct disclosure equilibria exist.

<sup>&</sup>lt;sup>19</sup> See also King and Wallin (1995), who find support for this notion.

empirical appeal. An interesting empirical interpretation of the model is that it predicts that full disclosure will occur in the most competitive environments; when threshold values are relatively low and proprietary costs relatively high. Although the firm would prefer to withhold its proprietary information when the cost of an adverse action is high, the likelihood that this cost will be imposed is also high and therefore the firm can not do much to prevent the competitor from taking the adverse action. Hence, the firm lacks the balancing argument to justify the partial (non)disclosure of its private information. The model predicts that the incidence of partial disclosure is most likely in competitive environments that can be characterized by relatively high threshold values and proprietary costs. These environments can be considered as industries in which the detrimental effect of an adverse action by a competitor can be relatively high, but the changes that it will occur are relatively low. The empirical implications of Wagenhofer's model are further investigated in Chapter 6 of this thesis.

#### 2.5 Asymmetric distribution of private information

Another seminal paper in the accounting literature regarding the break-down of complete voluntary disclosure is the paper by Dye (1985a). While the papers described in earlier sections showed that when disclosures are costly other than full disclosure equilibria might be viable, Dye gnawed at another fundamental assumption of Grossman/Milgrom's unraveling theorem. He let go of the assumption that the buyers know the sellers to have private information about the quality of the product for sale. In Dye's model the distribution of private information across sellers is asymmetric in the sense that some but not all sellers have private information about the quality of the product for sale. This asymmetric distribution of information itself does not have to create a disclosure problem. If, namely, uninformed sellers, who have nothing to disclose, can distinguish themselves from informed nondisclosing sellers, these groups can be separated from each other and all informed sellers can be forced to disclose. If, however, uninformed sellers cannot distinguish themselves, friction in the basic Grossman/Milgrom disclosure model is introduced. Dye shows that in this event no full disclosure will emerge. The reason for this is that a sophisticated buyer can no longer infer the worst from silent sellers, for silence is no longer irrefutably dictated by having nothing good to disclose. Hence, informed sellers can no longer be forced to disclose. Informed sellers of bad quality now have an opportunity to hide behind uninformed sellers. Therefore, applied to corporate decisionmaking, firms' managers can exercise discretion in informing the capital

market, if management teams are asymmetrically informed and uninformed managers cannot distinguish themselves from informed nondisclosing managers. Capital market investors will not adopt a posture of sophisticated skepticism when the firm's management fails to disclose its information, because they cannot distinguish between innocuous reasons (the firm has no information) and nefarious reasons (the firm is hiding information) for the firm's lack of disclosures (Dye, 1999, p. 1).

A more detailed discussion of the model of Dye will follow now.<sup>20</sup> Consider a manager and a (risk-neutral) investor who at the beginning of a one-period disclosure game share common believes regarding the period-end value of the firm. The game starts with a possible endowment of information about the period-end value to the manager. If the manager receives private information, he can credibly disclose it to the investor who then sets a price for the firm in accordance with this information. The manager, however, cannot credibly disclose that he did not receive any private information. The game is aimed at maximizing the market value of the firm. Hence, the manager wants the investor (a potential buyer of the firm) to believe his firm to be as valuable as possible, but he is not allowed to lie. Three events can happen. First, the manager does not receive private information and will not disclose. Second and third, the manager does receive private information and does or does not disclose the (true) content of this information. The interesting cases, of course, are those in which the manager does not disclose.

Thus, a manager does not disclose if he has nothing to disclose or if he does not want to disclose. A manager does not want to disclose if he expects the investor to value his firm with nondisclosure at least as high as with disclosure.<sup>21</sup> The value of the firm with nondisclosure depends on the probability that the manager has not been informed and the probability that its information is of such low quality that nondisclosure is preferable times the respective matching expected values. The probability that a manager is not informed is assumed to be common knowledge. The probability that an informed manager will not disclose and the matching expected value depend on a threshold level of disclosure that emerges as an equili-

<sup>&</sup>lt;sup>20</sup> This description is based on a paper by Jung and Kwon (1988), which extends Dye's results in a very useful way. In one of the two models presented by Dye (the one without moral hazard problems), Jung and Kwon resolve the problem of potential multiplicity of partial disclosure policies and establish a unique partial disclosure equilibrium.

brium strategy from the game based on rational expectations. A rational expectations equilibrium requires that the expected value upon nondisclosure equals this threshold value. Thus, the value set by the investor upon observing nondisclosure must equal the value of the firm the informed manager expects if he does not disclose.

Dye shows that there exists a unique equilibrium with a threshold value for disclosure that is higher than the lowest possible firm value but strictly lower than the expected value of non-informed firms.<sup>22</sup> This implies that the noninformed managers suffer under the existence of informed nondisclosing managers. Hence, such an equilibrium can only be sustained if it is impossible for the noninformed managers to convince the market of this. It is interesting to note that this equilibrium looks a lot like the one described in Verrecchia (1983) in which better signals than a certain threshold value are disclosed and those signals below the threshold are withheld. The main difference between these models is that in Verrecchia some nondisclosing (informed)<sup>23</sup> firms will always get undervalued, whereas in Dye this need not be the case.

The following empirical implications and corollaries can be deduced from Dye's disclosure model. First, the more likely it is for a manager to be privately informed, the lower the disclosure threshold. For as the subset of informed managers becomes larger, the threshold value for disclosure becomes lower and more firms will disclose. This more dynamic interpretation of the model can be represented by the situation of moving closer to the end of a reporting period in which it becomes more likely that a manager has received private information about period earnings. The more closely we get to the end of the reporting period, the model is that bad news is usually released towards the end of the period. For if the probability that a manager gets informed increases over time, the nondisclosure set becomes smaller, forcing out the release of incrementally bad information.

<sup>&</sup>lt;sup>21</sup> In case market value with disclosure equals market value with nondisclosure, the manager is assumed to prefer nondisclosure. This arbitrary postulation is added to exclude the existence of mixed strategies in which the manager can randomly choose to disclose or not to disclose.

<sup>&</sup>lt;sup>22</sup> Only in the limiting case in which none of the firms gets private information will the threshold value per definition equal the expected value of noninformed firms. In the other extreme in which all firms get privately informed, the game reduces to the Grossman/Milgrom full disclosure game.

<sup>&</sup>lt;sup>23</sup> Remember that in Verrecchia all managers have private information and the market knows this.

Another corollary of the model is the case in which investors practice private information acquisition or are able to get information related to the firm's prospects from another source, e.g. the financial press. As a result prior beliefs about firm value, which is an input variable in the valuation of nondisclosing firms, can change. If the additional information turns out to be bad, it can force managers who got privately informed to reveal their information that they would otherwise have withheld to mitigate the negative tendency. The model thus provides an explanation as to why we can observe a disclosure reaction of a firm immediately after a release of bad news in the financial press. More generally, a negative change in industry- or market-wide beliefs regarding the economical climate is likely to induce more disclosure according to the model.<sup>24</sup> A paper by Dye and Sridhar (1995) follows this more industry- or economy-wide notion by studying a similar setting as in Dye, but taking into account the influence of the disclosures or nondisclosures of other firms on investors' perception of the probability that a firm has received information. For example, if a firm from a particular industry reveals that it expects its earnings to be lower at the end of its accounting period because of a drop in sales in the last quarter, rival firms are likely to have received similar information. Hence, in this particular situation firms are less likely to present themselves as being ignorant.25

### 2.6 Nonverifiable information disclosure

A third important stream of literature amending the Grossman/Milgrom disclosure theorem is the "cheap talk" literature. The term cheap talk refers to information that can be costlessly disclosed but cannot be verified.<sup>26</sup> Cheap talk games have been introduced in the economic academic literature by Crawford and Sobel (1982). In their paper, Crawford and Sobel study the amount (if any) of information that can be inferred from unverifiable, (directly) costless messages sent by an informed party to an uninformed opponent. As such, they amend the basic Grossman/Milgrom anti-fraud rule assumption to investigate if disclosures can be informative when sellers are allowed to lie. Instead of ending up with a market break-down as

<sup>&</sup>lt;sup>24</sup> Of course, the reverse is also true.

<sup>&</sup>lt;sup>25</sup> An example of a disclosure of an economy-wide effect by one firm that has likely had an effect on investors' beliefs with regard to other firms is the first disclosure about the negative aspects of the turn of the millenium.

<sup>&</sup>lt;sup>26</sup> The assumption that no (direct) cost is connected with the disclosure is an important difference between cheap talk models and the nonstrategic signaling models (see, for example, Spence (1973)). Signaling models typically have exogenously given differential signaling costs, which allow the existence of equilibria in which agents are perfectly sorted (Crawford and Sobel, 1982, p. 1434). Disclosure costs in cheap talk models arise endogenously, i.e. they depend on the use of the message by an opposing party.

described in Akerlof (1970), Crawford and Sobel show that even if a credibility device or anti-fraud rule is absent disclosures can be informative. However, an important inference of the model is that such disclosures cannot be fully revealing, unless the interests of both parties completely coincide.<sup>27</sup> Not fully revealing or noisy disclosures are presented by a signal that does not discriminate as finely as possible among the possible states that can be distinguished. For example, a firm may choose to signal to the capital market that its expected earnings will be higher than last year, while it knows them to be exactly 10% higher.

Disclosure equilibria of this kind are to be distinguished from the partial disclosure equilibria that arise in the above discussed disclosure models. In a partial disclosure equilibrium private information is revealed when it belongs to a certain part of the distribution of all possible privately revealed signals and withheld otherwise. This means that the private signals that are publicly disclosed are fully revealing. Still, there is no question of full disclosure, because some private signals will be withheld. Would a partial disclosure equilibrium be applicable in the example just given, the firm could only disclose its expected earnings to be 10% higher than last year or be silent. In case of the equilibria arising from Crawford and Sobel's disclosure model, none of the public disclosures. Firms can communicate which step they have reached, i.e. in what part of the total distribution their private information lies, but they cannot reveal the exact value of their inside information. The number of steps that can be distinguished determines the amount of information that can be communicated, which in Crawford and Sobel's model. These stepwise disclosure equilibria are formally known as partition equilibria.

A nice and useful extension of Crawford and Sobel's model is provided by Farrell and Gibbons (1989). Farrell and Gibbons extend Crawford and Sobel's model in that they study the informativeness of cheap talk in case of two audiences instead of one. This extension is useful because it coincides with the disclosure settings of the anti-fraud rule models discussed in the preceding section. As will be shown later on this section, Farrell and Gibbons' study has been gratefully used to extend the game-theoretical disclosure models in accounting. The introduc-

<sup>&</sup>lt;sup>27</sup> Crawford and Sobel further show that in a cheap talk game there is always an equilibrium in which all messages are taken to be meaningless. Farrell (1993) refers to this typical cheap talk equilibrium as a "babbling" equilibrium.

<sup>&</sup>lt;sup>28</sup> Except for the limiting case in which both sender and receiver have exactly similar interests.

tion of an extra audience makes it also possible to study differences between private and public disclosure (of unverifiable information), where private disclosure is defined as talking to one audience or both audiences separately, and public disclosure coincides with talking to both audiences at the same time.

Farrell and Gibbons model the cheap talk issues in a very accessible way. In their model the sender can play three different disclosure games, i.e. cheap-talk games: two private disclosure games with each audience separately, and one public disclosure game with both audiences. The sender's private information is assumed to consist out of two possibilities, which he can reveal, lie about, or withhold.<sup>29</sup> The focus of the paper is on the credibility of public versus private (directly costless and unverifiable) messages. In the paper five cases are distinguished regarding the potential informativeness of public cheap talk in relation to the informativeness of private cheap talk. With respect to the credibility of private signals, three different cases can be distinguished: the sender can communicate credibly with both, one or none of the audiences. Regarding public communication two cases can be considered: the sender can or cannot communicate credibly.<sup>30</sup> Hence, a total of six different relationships between public and private communication can be distinguished (see Table 2.1). Since the case in which a sender's disclosure is informative for both audiences in private but not in public is inconceivable, five cases remain.<sup>31</sup>

<sup>&</sup>lt;sup>29</sup> Since the total support of the private information is confined to just two elements, disclosure equilibria can only be pooling or fully separating. The partition equilibria in Crawford and Sobel (1982) said to be characteristic for cheap-talk models (see footnote 27) will not emerge in the simplest case in which the distribution of private information has only two elements.
<sup>30</sup> The underlying assumption for this to be true is that at the start of the game both audiences hold common

<sup>&</sup>lt;sup>30</sup> The underlying assumption for this to be true is that at the start of the game both audiences hold common beliefs and are as capable of interpreting the messages addressed to them. Both parties differ from each other only in the possible use of the messages.

<sup>&</sup>lt;sup>31</sup> If a firm has nothing to hide for both parties in private, what reason can there be not to believe public disclosures (if the public consists out of both parties)? Farrell and Gibbons refer to this case as mutual subversion, which is formally ruled out by their proposition 1.

	Credible private communication with		
	Both	One	None
Credible public communication	Full communication	One-sided discipline	Mutual sided discipline
No credible public communication	No equilibrium solution*	Subversion	No communication

Table 2.1: Cheap-talk cases considered by Farrell and Gibbons (1989)

\* See footnote 31.

The least interesting cases, from a modeling point of view, are the limiting cases in which there is no communication at all or full communication. In the case of no communication the sender's messages are totally ignored by both audiences in private as well as in public. Each form of communication is useless, but because it is also costless (i.e. it is cheap talk) it might be observed in practice. In effect, the impossibility to exclude a no-communication equilibrium is characteristic for cheap talk models.<sup>32</sup> In the case of full communication the sender can communicate with both audiences in private and also in public, thus (see footnote 31). In this case there are no credibility problems. The more interesting cases are those in which not all cheap talk games have the same outcome. First, consider the cases in which cheap talk to both audiences at the same time can be credible, whereas informative communication with one or even both audiences in private is impossible. The case of informative disclosure to both audiences in public and just one of them in private is referred to as one-sided discipline. In such a setting the presence of one audience disciplines the sender's relationship with the other. For example, a firm cannot make a potential entrant believe in private that the prospects of its product market are too bad to justify entry, because it always wants him to believe that. However, the presence of a third listener with a contrasting interest to that of the entrant, say the capital market, may make the message more informative.<sup>33</sup> Another possibility is the case in which it is impossible to communicate credibly to both audiences in private, but not in public. In this setting the presence of two audiences with countervailing interests (regarding the sender's private information) may render information content to a public signal. In the former example the firm may also have an incentive to mislead the capital market (in that it always wants the market to believe that the prospects are good). If the relationships with the potential entrant and the capital market are equally important to the firm, publicly released messages can be informative. Farrell and Gibbons refer to this case as mutual discipline.

<sup>&</sup>lt;sup>32</sup> See also footnote 27.

The former two cases are examples of settings in which public messages may be more informative than private messages. The opposite may also be true, as the last case distinguished by Farrell and Gibbons shows. In this case the presence of one audience subverts rather than disciplines public communication. Therefore, although the sender can credibly communicate in private with one audience, the relationship with the other subverts the possibility of informative communication in public. If, for example, the relationship with the potential entrant is much more important than that with the capital market, public messages cannot be believed.

The more interesting cheap talk cases distinguished by Farrell and Gibbons have been employed in the disclosure model literature by Newman and Sansing (1993), and Gigler (1994). Newman and Sansing study the case in which a firm could credibly communicate with its shareholders but where public disclosure may be partially or even fully subverted by the presence of a potential entrant in the public domain. Gigler considers the case in which the firm cannot credibly communicate in private with both the capital market and a product market competitor, while public messages may be believed because of mutual disciplining. In both of these models it is assumed that the firm is a listed company and is therefore forced to communicate publicly to capital market investors. Thus, private messages are not considered.

Newman and Sansing conceptualize the subversion case as follows. A firm is endowed with private information on its future dividend, which it truthfully wants to signal to its shareholders. Shareholders are assumed to be interested in this information for it can help them make the optimal investment/consumption decision. However, the presence of a potential competitor considering entrance in the firm's product market hinders communication between the firm and its shareholders. The cost adhered to the possible detrimental action of the entrant causes the friction that prevents truthful full disclosure. The main difference with earlier disclosure models that consider a similar setting, in particular Wagenhofer (1990), is that the private information cannot (or is too costly to) be verified. An example of an unverified and nearly costless message could be an earnings forecast. Since earnings forecasts are hard to verify or are too costly to be verified, firms may make false disclosures. The paper focuses on the question how much (if any) information can be derived from such messages, i.e. cheap talk, in the setting considered.

<sup>&</sup>lt;sup>33</sup> In the finance literature Bhattacharya and Ritter (1983) and Gertner, Gibbons and Scharfstein (1988) elaborate

27

To create possible friction between two audiences they have to have conflicting objectives with respect to the use of the private information that may be revealed. Furthermore, it is necessary that the truth comes out at the end of the game, so that the payoff of all players can be determined. Thus, the interesting moment lies before the end of the game: when the firm is asymmetrically informed about something that is of interest to two other players who have to take an action which influences not just their own payoff but also that of the firm. Newman and Sansing consider the basic relation between a public firm and its capital suppliers – more precisely its shareholders – in the light of an opposing party: a product market competitor. The role of the competitor in the communication game is straightforward: he wants to use the information to make a better investment decision, modeled as an entrance decision in Newman and Sansing. The competitor does not want to wait too long, i.e. he cannot wait till the end of the game, since then its entrance option expires.

For the investor, however, it is not that straightforward not to wait till the end of the game when the truth comes out. (What early decision should he have to make to attract him to the communication game?) In Newman and Sansing investors are made involved by assuming that they want to make a consumption decision when the private information is revealed to the firm. The underlying assumption is that investors are not only concerned with total wealth, but that they also want to consume it smoothly across periods. In the two-period game considered by Newman and Sansing, this means that investors want the firm to reveal their private information early and truthfully so they can optimally smooth consumption over time. The firm is assumed to act in the interest of its existing shareholders, and therefore no communication problem would exist without a third opposing party. However, when such a party does exists, e.g. a potential competitor that might enter in certain cases reducing the value of the firm and thus total consumption for the shareholders, an incentive to manipulate disclosures is created. This is the friction in the model that provides the conditions under which the disclosure decision has to be made.

With respect to disclosure practices, the model of Newman and Sansing rationalizes the following ones. As is characteristic for cheap talk models, there is an equilibrium in which no information transmission between the sender and receivers takes place. Hence, the presence of a potential competitor can fully subvert the relation between a public firm and its sharehol-

on a similar idea. In these papers, however, signals are costly.

ders. This outcome resembles Farrell and Gibbons' subversion case. Without the threat of a competitor<sup>34</sup> or whenever the firm could talk to its shareholders in private, full disclosure will take place. The presence of the competitor and the inability to communicate privately, however, subverts the firm's relationship with its capital suppliers. Next to this complete uninformative result, there are other equilibria in which shareholders and the entrant can learn something but not all about the contents of the firm's private information.<sup>35</sup> Most of these equilibria are partition equilibria (see the discussion of the model of Crawford and Sobel (1982)), meaning that the firm only signals an interval in which its private information may lie and the number of intervals determines the informativeness of the firm's equilibrium disclosure strategy. However, rather unusual for a cheap talk model, Newman and Sansing also derive a rational disclosure equilibrium in which the firm may make truthful and complete disclosures for some realizations of its private information, while noisy disclosures always exist for other realizations.

Gigler's (1994) model is another application in the analytical disclosure literature in accounting of one of the cases described by Farrell and Gibbons. While Newman and Sansing looked at the subversion and one-sided discipline cases, Gigler employs the mutual discipline case. Gigler claims that the primary insight of his model is that unverifiable and costless public corporate messages can be informative even if credible communication with both the product and the capital market is impossible in private. Although this insight is nothing new – it follows directly from Farrell and Gibbons' mutual discipline case – the richness of the model and the more direct accounting application allow for more tangible results.

A key assumption in Gigler's model is that firms wish to mislead the capital market. The ratio behind this assumption is the distinction that can be drawn between present and potential

<sup>&</sup>lt;sup>34</sup> Which would be the case in Newman and Sansing for entry costs that are zero or so high that entering would never be considered. In these cases the role of the third, opposing party would be finished and the simpler one audience game remains.

<sup>&</sup>lt;sup>35</sup> In the enumeration of Farrell and Gibbons in Table 2.1, these equilibria could be considered as one-sided discipline: the presence of shareholders may make public disclosures informative to competitors, whereas private messages would not be informative. The "problem" with applying the cases considered by Farrell and Gibbons is that the simple way in which they are modeled (just two different sender types and two different receivers' actions) refers to knife-edge cases. Therefore, Newman and Sansing only refer to the subversion case to compare their work with that of Farrell and Gibbons. The one-sided discipline alternative is not mentioned, probably because in Farrell and Gibbons this setting leads to full revelation of the firm's private information, whereas in Newman and Sansing it does not (because they consider a continuum of sender types and receivers' actions). Still the idea behind both the fully separating one-sided discipline case and the partially revealing disclosure equilibria of Newman and Sansing is the same.

shareholders.<sup>36</sup> In Gigler firms are assumed to act in the interest of present shareholders and not in the interest of all shareholders. As a result, the firm has an incentive to overprice its shares to the capital market, i.e. potential new shareholders. Furthermore, firms are assumed to have an incentive to underprice their shares to product market competitors. Thus, this setting makes it very unlikely for a firm to be able to communicate credibly in private with both audiences if the messages that can be send are unverifiable and costless. If the firm can address its messages to both audiences simultaneously, however, its disclosures can be made credible and informative to both groups. For example, a firm has an investment opportunity that it can only initiate by issuing new shares to the capital market. In order to receive a share price that is as high as possible the firm wants to convince the market that the project is highly profitable. The presence of a product market competitor, however, provides an incentive to underestimate the profitability of the project. If the capital market and the competitor are equally important to the firm, public disclosures may be informative because of the opposite interests of the firm with each stakeholder.

The formal presentation of the corporate disclosure decision in Gigler's model is as follows. At the beginning of the game the firm receives private information about the demand for a product. However, this product can only be sold if the capital market is ready to finance the necessary investment outlay. For this reason, the firm has an incentive to report high demand in order to evoke a favorable reaction by the capital market. At the same time the firm addresses the capital market, it has to choose output quantities in the presence of a competitor.<sup>37</sup> For this reason, the firm wants the competitor to believe that demand is low in an attempt to increase its share of the total pie. Hence, the disclosure problem faced by the firm is to balance the effect of the public message on the capital market and the competitor, being the tradeoff between a higher (lower) share price (i.e. lower (higher) financing cost) and lower (higher) output quantities related to reporting high (low) demand. Gigler shows that in such a setting unverified and directly costless disclosures can be informative and he shows what the equilibrium disclosure strategies look like. In addition to the typical noninformative disclosure equilibrium, there are informative disclosure equilibria that are all partition equilibria. Hence, Gigler predicts that in the setting he describes no firm will fully disclose its private information.

<sup>&</sup>lt;sup>36</sup> See also Myers and Majluf (1984).

Gigler's model has a lot in common with the model of Newman and Sansing. Both models relax the anti-fraud rule (or no-lie) assumption of previous disclosure models in accounting and show that even in this case disclosures can be informative. However, they differ in the way in which the credibility problem is resolved. In Newman and Sansing the friction in the disclosure game consists only of a constant cost that is imposed on the firm if entry by a competitor occurs. This cost can be seen as a proprietary disclosure cost. If it were not for the cost, firms would credibly disclose all private information to their shareholders. Gigler also employs proprietary cost in his disclosure game but he models these costs more neatly in that they directly depend on the firm's private information instead of being a constant. However, in Gigler's model the proprietary cost (i.e. the reduction in output quantities) does not hinder credible disclosure opportunities, as it usually had been postulated in the literature; instead it creates an opportunity to disclose. This is because Gigler assumes that firms have an incentive to lie to the capital market, too. A firm can only give informative signals if it can balance the effect of disclosures on the capital market with a synchronous (opposite) effect on the other party, for example a competitor. A further difference between the two models is that Gigler models product market competition as a duopoly and not as an entry game (as it is usually done), which enlarges possible strategies for the competitor from two (i.e. entry or nonentry) to a continuum. A final importance difference between both models is that Newman and Sansing show the existence of an equilibrium strategy in which for some realizations of private information complete disclosure will take place, whereas in Gigler only partition disclosure equilibria are sustained.

If the disclosure of proprietary information has a cheap talk character, i.e. if the disclosed information is unverifiable and directly costless to reveal, the following empirical implications can be deduced. First, it can be concluded that even if firms are allowed to lie and information has a proprietary nature, informative public disclosure can occur. According to the models of Newman and Sansing (1993) and Gigler (1994), however, disclosures cannot be fully revealing under these conditions and will take the form of a qualitative statement, such as an announcement that next period's earnings will be higher or slightly higher than this period's earnings.<sup>38</sup> Hence, a full disclosure equilibrium can not exist. Another general result of both models is that situations in which all disclosures are uninformative may always exist.

<sup>&</sup>lt;sup>37</sup> Product market competition, thus, is modeled as a Cournot duopoly in Gigler (1994).

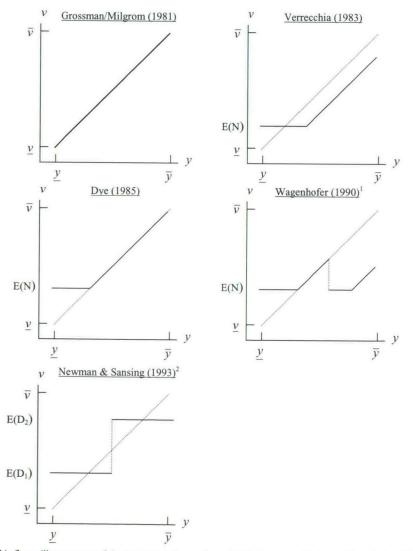
<sup>&</sup>lt;sup>38</sup> The exception is the partially fully separating equilibrium alternative in Newman and Sansing. In this equilibrium, the better firms will give complete disclosures and the worse firms will be silent.

Furthermore, Newman and Sansing predict that for industries with a high value of nonentry, firms in industries with very low or very high entry costs will make more informative disclosures than firms in industries with moderate entry costs. This prediction is based on the idea that in case of very low or very high entry costs, the firm cannot do a lot to deter entry or does not have to fear entry of a potential competitor, respectively. Hence, the relationship with its capital suppliers outweighs the relationship with the entrant in both cases. Since it is assumed that firms do not want to lie to their capital suppliers, more informative disclosures are expected. In contrast, Gigler shows that (unverifiable and costless) disclosures can be more informative in case the relationships of the firm with both of its listeners are more in balance. The main reason for this is that Gigler assumes that the firm wants to lie to both the capital market and the product market. In such a setting, "...proprietary costs provide the impetus for disclosure where there would otherwise be none" (Gigler, 1994, p. 235). Thus, according to Gigler we could observe firms seeking for an environment in which they can address their messages publicly to inform interested parties outside. Generally, both cheap talk disclosure models face difficulties in case of empirical evaluations. This is particularly true in the operationalization of interval messages and the determination of how the amount of disclosure depends on the environment.

# 2.7 Overview of the main disclosure models

The cheap talk models of Newman and Sansing, and Gigler more or less mark the end of a stream of research on voluntary disclosure in which the main assumptions of the Grossman/Milgrom full disclosure theorem are questioned. Successively, the assumptions of costless disclosure, symmetric private information distribution and truthful disclosure were loosened, resulting in a subversion of the full disclosure result. It appears that when disclosure is costly or when parties do not know whether the manager is better informed or when disclosure sures may be untruthful, other than full information equilibria may occur – a result which seems to be more in accordance with disclosure practices. Thus, these models provide support for the common observation that managers do and sometimes do not disclose their private information, i.e. that they exercise discretion over disclosures.

Figure 2.2: An illustrative comparison of the basic voluntary disclosure models The examples presented in this figure are based on the assumption that private information, y, is uniformly distributed at interval  $Y = [\underline{y}, \overline{y}]$ . Furthermore, it is assumed that private information solely and directly determines the value of the firm, v(y). E(N) represents the expected value of the firm with nondisclosure and E(D) the expected value with disclosure.



<sup>1</sup> This figure illustrates one of the two general forms of a partial disclosure equilibrium in Wagenhofer (1990). The other partial equilibrium has only one disclosure interval in which only medium values of y are disclosed. Furthermore, there is always a full disclosure equilibrium in Wagenhofer (1990).

 $^2$  This figure illustrates the example discussed in Newman and Sansing (1993), in which the competitor does not enter in the upper disclosure interval, D<sub>2</sub>. Apart from other incomplete informative (partition) equilibria a completely uninformative equilibrium always exists. Gigler's (1994) model can be illustrated by a similar equilibrium, in which firms only disclose on which interval their private information lies.

Figure 2.2 presents an overview of the equilibrium disclosure strategies firms' management can follow according to the main disclosure models discussed so far. The characterizations of the different disclosure equilibria should not be interpreted to strictly. The delineation of the disclosure and nondisclosure subsets (i.e. the thresholds in the models) depends strongly on the specific modeling assumptions. Nevertheless, the models can be used to assess the likelihood that a firm will disclose. The empirical study that is reported in Chapter 6 of this thesis uses the discretionary disclosure models in this manner to estimate the likelihood of disclosure in the presence of competitor-related proprietary costs.

#### 2.8 Further models

This chapter ends with a discussion of other, mostly more recent research on voluntary disclosure, to show some possible avenues of further research on this topic. By no means this discussion pretends to be complete. The main purpose is to describe per issue that was raised by the studies of Grossman and Milgrom – namely costless/costly disclosure, a/symmetric distributed private information and un/verifiable disclosure – a further extension.

A study that is interesting to note is a model introduced by Hayes and Lundholm (1996). Hayes and Lundholm consider the firm's choice to disclose its results in segments or in aggregation in the presence of a competitor. In their model an entrepreneur is faced with the tradeoff of decreasing adverse selection costs by providing the capital market with more precise information against the costs of aiding its competitor in its choice to allocate its activities in the most profitable segment. They find that in a highly competitive environment firms with quite similar results from their different activities will report these results as separate segments, while firms with disparate results will only report an aggregate result (i.e. one segment). When results across different activities are rather similar, the competitor will not learn a lot from the separate disclosure of these results while the firm avoids adverse selection in the capital market. When results are rather different, however, reporting them in segments would reveal the most interesting market to the competitor. Then, if the firm expects to lose more on informing its competitor than it can gain by informing the capital market, it prefers to not report its results as separate segments.

Compared to earlier models that also consider disclosure choices in the presence of a competitor, like Verrecchia (1983) and Wagenhofer (1990), Hayes and Lundholm claim that their model is more concerned with the fineness or precision of the disclosure than with the existence of disclosure. While the earlier models show under which conditions a firm may or may not disclose its private information, Hayes and Lundholm consider under which circumstances a firm may provide additional, more precise information up and above the mandatory disclosure (i.e. the overall result). In this respect, the model bears resemblance to the cheap talk models that are also more concerned with the degree of informativeness that can be gleaned from (possibly untruthful) disclosures. Contrary to these models, Hayes and Lundholm use the more common anti-fraud rule approach.

Another study that is also more concerned with the precision of the disclosure is Verrecchia (1990b). This study is an extension of Verrecchia (1983) and analyzes the choice of a manager to disclose or withhold perfect private information about the true liquidating value of the firm (or more generally a risky asset). When disclosure bears a direct and fixed cost, there is a threshold above which the manager reports and below which he withholds his private information. This threshold will increase with the disclosure cost. In his extension, Verrecchia shows that if the private information about the liquidating value is not perfect – that is the precision or quality of the private information may vary – the threshold value of disclosure rises (falls) if the information becomes less (more) precise. Thus, the more precise the quality of the private information, the more likely it is that it will be disclosed and that the disclosure cost will be imposed. Therefore, if a manager can choose whether or not he is privately informed, he will prefer to be not informed to avoid the cost that occurs with disclosure.

Pae (1999) provides an extension of Dye's (1985a) and Jung and Kwon's (1988) model. In this model the manager of the firm can influence both the contents of the private information and the probability of receiving private information. More specifically, Pae extends the Jung and Kwon model in the following two directions. First, a manager is allowed to provide costly effort that stochastically enhances the future income of the firm; second, the manager can acquire at a cost a private signal about the future income of the firm. The objective of the model is to examine the influence of voluntary disclosure on the firm's production decision when private information is costly to acquire. Pae finds that under the described circumstances the firm's choice of productive effort is distorted due to an unavoidable incentive to acquire private information and use discretionary disclosure to manipulate investors' beliefs. Like in Verrecchia (1983, 1990b), the manager would be ex ante better off if it could choose not to be informed. However, he cannot make a credible commitment to do so, because after

the manager made some effort, there is always an incentive to acquire private information and disclose it selectively. Since investors are assumed to rationally anticipate this ex post incentive, they "price-protect" themselves by offering a lower price to the manager.

Finally, we want to highlight a paper by Stocken (2000) that extends the results of Newman and Sansing (1993), and Gigler (1994). Stocken examines the informativeness of nonverifiable costless messages in a repeated cheap-talk game setting. He finds that when communication between a firm and investors is done repeatedly, the firm almost always truthfully reveals its private information. Hence, within a multiperiod setting reputational considerations may ensure credible disclosure without the use of the anti-fraud rule assumption. In this respect we are back to square one in that full credible disclosure may occur "naturally", like in the models of Grossman (1981) and Milgrom (1981), without the establishment of mandatory disclosure rules. However, in Stocken's model proprietary disclosure costs are not considered and these costs are likely to hinder the credible disclosure of a firm's private information.

### 2.9 Summary

This chapter has described the development of a theory of disclosure that tries to explain why we may observe managers of a firm sometimes disclose and other times withhold information. The development of this theory starts with a basic result in the economic literature that states that when an asset is offered for sale and the seller is better informed about the asset's quality, a rational buyer will discount the asset's value until that point at which it is in the seller's best interest to reveal its private information. Hence, full disclosure will occur. This description of information disclosure in markets does not fit the commonly observed discretionary disclosure behavior of managers. In this chapter it has been shown that there may be at least three reasons for partially withholding value-relevant information. First, disclosure can be costly which may prevent the disclosure of information that is not valuable enough to overcome the cost of disclosing it. If the costs of disclosure follow merely from an adverse action of one of the listeners, even more than one threshold for disclosure may occur. Second, if it is unsure whether the managers of a firm are asymmetrically informed a threshold for disclosure may emerge, too, even if disclosure is costless. The reason for this is that an investor cannot infer the worst from silent managers, for silence may also stem from having nothing to disclose. In such a case, managers of firms with low-quality information can hide behind managers of firms that are not asymmetrically informed, assuming of course that informed management

teams cannot be distinguished from uninformed management teams. Finally, if disclosures are unverifiable and therefore may be untruthful, full disclosure is unlikely to occur. Still, credible disclosure between managers and outside investors is possible if there is another audience that has conflicting objectives with respect to the use of the information that may be revealed. The trading off of these objectives may induce credible disclosure. In the next chapter we will link the theory of discretionary disclosure to the corporate financing issue of going public.

# **Chapter 3**

# The Influence of Disclosure Costs on the Decision to Go Public: An Analytical Exploration

#### **3.1 Introduction**

The previous chapter has shown what the costs and benefits of disclosure are and how they may influence the firm's propensity to disclose. The main benefit of disclosure is that it can reduce undervaluation caused by adverse selection problems, which in their strongest form may result in a complete market break-down (Akerlof, 1970). Disclosure is a means to prevent the market from breaking down. A strong result from the disclosure literature described in Chapter 2 is that whenever credible disclosure is possible and costless, full disclosure will occur. The existence of disclosure costs, however, may prevent the full disclosure of private information. The most compelling costs of disclosure are those that emerge from the use of the disclosed information to the disadvantage of the disclosing party. These costs are referred to as proprietary disclosure costs. A natural candidate for the detrimental usage of disclosed information is the product market competitor, who for this reason fulfills a central role in this thesis. In the previous chapter it has been shown that proprietary disclosure costs can decrease (Verrecchia, 1983), increase (Gigler, 1994) or ambiguously effect the propensity to disclose (Wagenhofer, 1990).

This chapter aims at linking disclosure to corporate financing. Generally, corporate financing refers to the issue of optimally determining the firms mix of debt and equity capital. However, it may also refer to the issue of choosing the optimal market from which to attract capital. Since capital markets can be characterized by differences in disclosure threats and opportunities (a subject we will discuss extensively in Chapter 5), this latter issue is particularly related to disclosure considerations. Differences in disclosure threats and opportunities, i.e. differences in disclosure environments, are primarily caused by differences in accounting and disclosure rules and the thereto related monitoring. The existence of differences in the disclosure sure environment of differing capital markets links disclosure considerations to the firm's financing or issuing decision. In this and the next chapter we will step by step develop a

model that links the disclosure decision in the presence of proprietary costs with the financing decision, that in the context of this thesis is defined as the decision on the optimal capital market to attract capital from. For the sake of tractability we will only distinguish between two types of capital markets: public and private capital markets. But before we enter into the formal analysis, we will first define public and private capital markets and provide an overview of the main differences between both capital market types that have been documented in the literature.

#### 3.2 Differences between public and private capital markets

A general distinction between private and public capital markets is not easily provided. A possible distinguishing aspect is the number of investors that is involved in an issue. Typically, a public offering is sold to a large number of investors, whereas a private offering is sold to a few large investors. Ross, Westerfield and Jaffe (1999) define private capital issues as issues where fewer than 35 investors are concerned, and according to Brealey and Myers (2000) private issues are sold to no more than a dozen knowledgeable investors. We can also consider formal rules stated by regulating authorities to distinguish public from private issues of securities. In the Netherlands, for example, the law requires all placements of securities to be accompanied by a (audited) prospectus and the issuing party has to make public disclosures periodically (Wet Toezicht Effectenverkeer (Wte) 1995).<sup>1</sup> In this respect, there is no formal difference between the placement of equity capital on and outside a formal capital market. However, there are exceptions for certain private placements. One of these concerns placements to professional investors only. In such case the issuing company is relieved from the public information duty. In the United States a similar regulation applies; private placements to sophisticated investors with the capacity to investigate securities are exempt from SEC registration.<sup>2</sup> Once a certain number of investors gets involved in a company, regulators may effectively force this company to go public. In the United States, companies with more than 750 shareholders and \$1,000,000 of total assets are subject to the same disclosure requirements as publicly listed companies. In the Netherlands a similar procedure applies (Pagano and Röell, 1998, p.201).

<sup>&</sup>lt;sup>1</sup> Before the enactment of the Wte in 1992 (Wte 1992) companies that issued shares privately were only required to publish a prospectus.

<sup>&</sup>lt;sup>2</sup> Private equity capital is called letter stock in the United States, so called because the SEC requires a letter from the buyer confirming that the stock is not bought for resale (Brealey and Myers, 2000).

Generally, individual and institutional investors supply public capital, whereas parties like families, venture capitalists, informal investors, and commercial banks are the main suppliers of private capital. In the Netherlands private placements of capital are far more common than public placements, even for listed firms. An Initial Public Offering (IPO) is often the only contact a Dutch listed company has with a primary public capital market: the occurrence of seasoned offerings is rather rare in the Netherlands.<sup>3</sup> On the other hand, IPOs usually concern a much larger issue than private placements. In the United States public placements are more common than in most other countries, although even there just a fraction of all corporate financing comes from external equity markets.<sup>4</sup>

The literature mentions many factors that may to a certain extent influence the decision to finance publicly or privately. An enumeration of the main factors is listed below.

- *Extent of monitoring.* Private placements involve fewer investors, who can monitor the firm more directly. Large, active investors often play a monitoring role that raises the value of all shares. Holmström and Tirole (1993) state that there may be benefits connected with some outside monitoring by the stock market. An example of this is the possibility to write more efficient managerial incentive contracts using the stock price. From the viewpoint of the initial owner of a firm, large investors may monitor too much, which decreases the present value of private benefits. As Pagano and Röell (1998) show, overmonitoring may lead to a firm going public.
- *Ease of renegotiation and speed of issuing*. Private capital contracts are more easily renegotiated and can be issued faster.
- *Distribution costs.* The costs of distributing securities are lower in private markets, because the number of investors is usually much smaller.
- *Flotation costs*. Public issuing of securities brings about larger flotation costs than private placements, including listing costs (fees for registering with the capital market), investment bankers' fees (i.e. underwriting costs),<sup>5</sup> accountants' fees, legal fees, and printing costs. Ritter (1987) estimates that for United States companies listing fees and commissions at the time of going public alone amount to \$250,000 plus 7 per cent of the money

<sup>&</sup>lt;sup>3</sup> See De Jong and Veld (2000).

<sup>&</sup>lt;sup>4</sup> MacKie-Mason (1990) found that on average 2% of all corporate financing comes from external equity markets.

<sup>&</sup>lt;sup>5</sup> One reason for underwriter fees to be higher for public offerings is the fact that potential litigation costs to the underwriter are higher for public offerings.

raised. Pagano and Röell (1998) argue that part of the flotation costs of public placements derives from the fact that upon listing the company, the original owner can no longer prevent changes in the identity of his external investors (called "loss of the private benefits of control" by Pagano (1993)). Because a considerable part of the flotation costs is fixed, there are economies of scale in issuing securities that are larger for public issues.<sup>6</sup>

- *Liquidity*. Public capital has a discount relative to private capital due to higher liquidity on public securities. Liquidity refers to the ease with which an investment can be converted to cash and vice versa. Clearly, private capital investments are more difficult to liquidate than public capital investments and therefore private investments generally sell at a discount relative to public investments. Koeplin, Sarin and Shapiro (2000) provide evidence for the existence of such a discount.<sup>7</sup>
- *Diversification*. Selling publicly to a large number of investors instead of privately to one or a few large investors benefits the issuing firm because each investor will be better diversified. And consequently, in a competitive public capital market, the return required to compensate for idiosyncratic risk will be lower.
- Information production and search costs. In a private company adding more investors can be very costly because each new investor must spend time and effort to check whether the company is a sound investment. Beyond a critical number of investors, it becomes more cost-effective to list the securities publicly, so that dissemination of information and trading activity are more centralized (Pagano and Röell, 1998). Fama (1985) argues that the costs of producing the information required for public debt financing are too high for small firms.
- Mispricing. There is a large body of empirical evidence suggesting that managers can successfully time new issues to take advantage of excessively optimistic investors sentiment (Röell, 1996). These periods of excessive investor optimism appear to create "windows of opportunity" during which a considerable higher than normal number of firms enters the public capital market.

<sup>&</sup>lt;sup>6</sup> Evidence from Cohan (1967), the SEC (1957), and Shapiro and Wolf (1972) suggests flotation costs are smaller for private than for public sales.

<sup>&</sup>lt;sup>7</sup> See also Silber (1991), Hertzel and Smith (1993) and Emory (1994).

In case of an IPO several additional factors may be considered:

- *Disclosure requirements and confidential information.* Private placements are exempt from disclosure requirements set by public capital market authorities. In most countries publicly traded companies are subject to considerably tighter disclosure requirements and more transparent accounting standards than private companies (Pagano and Röell, 1998, p. 208). These tighter disclosure requirements bring about disclosure costs that are higher for publicly listed firms. These costs are partially caused by additional mandated periodical disclosure requirements, like annual and semi-annual reporting; and partially they stem from the leakage of confidential or proprietary information (see also Chapter 2).<sup>8</sup> Also, the extent to which a public firm is exposed to lawsuits in the event of disclosure errors is likely to be higher for public firms. Particularly with respect to information about the future of the firm (like expected earnings), which public firms have to disclose or are expected to disclose, the likelihood of making disclosure errors is higher.
- Awareness. Once a firm goes public, it attracts more attention. Financial analysts and the press, for instance, focus more on public firms which may increase liquidity of the companies' traded securities (Merton, 1987). Also, the familiarity with the companies' products may increase because of more press attention. On the other hand, increasing public attention might be vulnerable to the company because it can "wake up sleeping dogs", like product market competitors (see Chapter 2) or tax authorities. This latter point is related to the confidentiality argument mentioned earlier.
- Underpricing. According to Ritter (1987), the cost related to underpricing mounts up to 15% on average of the funds raised for United States companies. Underpricing, however, also takes place with private placements of securities. Maksimovic and Pichler (1998b) show that under certain circumstances underpricing may be even greater with private than with initial public offerings.<sup>9</sup>
- *Opportunity costs.* Going public requires a great deal of time of the management team which is generally greater than in private offerings.<sup>10</sup>

<sup>&</sup>lt;sup>8</sup> See Maksimovic and Pichler (1998b), footnote 4, for the importance of revealing information, even in more traditional industries. An article in Inc. Magazine ("The Next Big Thing", February 19, 1996) on a venture fund in the fast-food industry notes that some entrepreneurs forgo public financing and expansion due to "the kind of scrutiny you go under. The fact that you publish a prospectus that tells all your secret information. They jeal-ously guard what they think of as their herbs and spices."

<sup>&</sup>lt;sup>9</sup> See their Proposition 7 and footnote 45.

<sup>&</sup>lt;sup>10</sup> Kensinger, Martin and Petty, for example, mention a survey in which CEOs who had participated in public offerings indicated that they spent 33 hours per week on the offering for a period of 20 weeks.

- Status. A public listing may provide an initial certification by financial market professionals but also a longer-term price signal to suppliers, workforce and customers (Röell, 1996). A solid market price for the firm's traded securities can function as a warranty to lenders that they can safely give credit and to suppliers, workers and customers that they can safely enter into longer-term contacts with the company.
- *Remuneration opportunities*. A public listing offers additional remuneration opportunities. Employee stock options, for example, can be useful to motivate employees and to attract or keep good personnel.
- *Take-over threat*. Public ownership creates the possibility of hostile take-overs. Pagano et al. (1998) find that original owners on average retain a majority of voting rights after an IPO.

If we summarize the points mentioned above, it can be concluded that there may be circumstances in which public financing is more attractive than private financing, as well as circumstances in which the reverse is true. There is, however, a general agreement that public capital markets provide firms with low-cost financing opportunities, mainly because of liquidity and diversification arguments.<sup>11</sup> But because the reverse case may also occur, we will consider both cases in the analyses that follow below. In these analyses, which are described in this and the next chapter, we will specifically investigate the influence of confidential or proprietary information considerations on capital market choice, i.e. the choice to finance publicly or privately.

<sup>&</sup>lt;sup>11</sup> See for example Healy and Palepu (1995). A formal argument for this statement is provided by Maksimovic and Pichler (1998a), who show that the offering to a limiting pool of private investors has an adverse effect on the pricing of initial offerings, even in the absence of risk aversion and liquidity concerns. See also Koeplin, Sarin and Shapiro (2000) who provide empirical evidence that private companies sell at a discount relative to comparable public companies.

# 3.3 A simple model<sup>12</sup>

Imagine a firm with a (positive net present value) investment opportunity and a shortage of internal funds so that it needs to seek for outside financing. Because we want to concentrate on the choice between public or private financing we ignore capital structure issues. We assume that the offering concerns equity securities although it may concern debt securities as well. Furthermore, the firm meets the formal requirements for listing at a public capital market. If the firm issues publicly, it has to publicly disclose its value-relevant private information including information that may be proprietary in nature. All public disclosures are assumed to be credible. This assumption, referred to as the anti-fraud rule, is a common assumption in the basic disclosure literature in accounting (see Chapter 2) and can be defended by the fact that most public disclosures related to a public offering of securities have to be verified by an auditor and that a public offering is often warranted by an investment banker. As an alternative to going public, the firm can stay private and place its securities directly (i.e. without any intermediate cost) with a venture capitalist<sup>13</sup> or other large private (informal) investor. We assume in this case that the firm does not leak any proprietary information to opposing parties. Moreover, we assume that the private issuer cannot credibly disclose any value relevant information. The lack of audited disclosure standards in private capital markets<sup>14</sup> and difficulties with or high costs related to warranting a private issue by an investment banker may render this assumption plausible.15

For reasons of tractability, we assume that the relevant private information refers to just one aspect of the company and is both value-relevant and proprietary in nature. An example of what this information may represent is the information about the planned use of the proceeds

<sup>&</sup>lt;sup>12</sup> This model originated from Melnik and Plaut (1994), who try to explain how the debt market is divided into public and private securities markets. Their model suggests a dichotomy of the debt securities market in which the relatively low quality issuers issue privately and the relatively high quality issuers issue publicly, where quality is defined as the probability that the firm repays its debt. This segmentation is partly driven by the assumption that private issuers cannot credibly disclose their quality to potential investors, whereas public issuers can. Consequently, private capital can only be offered at an average rate, whereas public capital is customized. Furthermore, it is assumed that public placements incur an additional cost relative to private placements. Thus, the model trades off the adverse selection cost of private placements and the additional cost of public offerings. However, the model is inconsistent in that it assumes that corporate issuers base their issuing decision on actual interest rates instead of expected total financing costs.

<sup>&</sup>lt;sup>13</sup> One special role of venture capital in financial markets is the confidential provision of equity financing (Yosha, 1995, p. 16).

<sup>&</sup>lt;sup>14</sup> Cf. Melnik and Plaut (1994).

<sup>&</sup>lt;sup>15</sup> In a private placement the role of an investment banker, if considered at all, is mostly reduced to bringing together issuers and potential purchasers.

from the issue. Such information may be both value-relevant and proprietary in nature and generally has to be disclosed publicly by public offering firms and can be withheld in case of private offerings.<sup>16</sup> More specifically, if the newly raised capital is going to be used to introduce a new production technology or a new product, this information is both relevant to investors considering the purchase of equity claims as well as product market competitors who want to protect their market share or who might copy the new technology or enter the newly created product market.

Summarizing, the characteristic difference between both capital markets is the possibility to credibly disclose ones value relevant private information in a public capital market and therewith reduce adverse selection costs.<sup>17,18</sup> This opportunity, however, bears a cost. First, a public and credible disclosure is assumed to be costly due to direct disclosure costs such as an audit cost or an investment banker's fee. Second, public disclosure can result in a proprietary disclosure cost, i.e. a cost imposed by an opposing party due to the disclosure of proprietary information. Thus, in this setting the firm is faced with the trade-off between adverse selection costs (in case of private financing) and disclosure costs (in case of public financing) in deciding on the optimal (i.e. least costly) issuing choice.

Investors, corporate issuers, and opposing parties are all assumed to be risk-neutral. The markets for equity claims are perfectly competitive, so all investors, public as well as private ones, are assumed to be price takers. Issuing firms differ with respect to the quality of their private information about the prospects of the investment opportunity. Assume that this information asymmetry is nourished by the difference in knowledge about the probability that the firm will pay a fixed (terminating) dividend at the end of the investment period. We refer to this probability as the payment probability. At the end of the private firm pays the divi-

<sup>&</sup>lt;sup>16</sup> In the United States before issuing a security on one of the stock exchanges a firm is required to submit a registration statement to the SEC, which includes information about the proposed financing, the firm's history, existing business, and plans for the future. The information disclosed includes the planned use of the proceeds. Private placements in the United States are exempt from the registration requirement. In the Netherlands, as in all European Union member states, public reporting requirements depend on size, not on listing status. Private firms, however, are not required to communicate publicly about the use of newly attracted capital as IPO-firms are.

<sup>&</sup>lt;sup>17</sup> We relax this assumption in Section 5 and allow for credible disclosures in both capital markets.

<sup>&</sup>lt;sup>18</sup> We adhere with this respect to the conventional wisdom that disclosure results in more liquid markets and consequently in a lower cost of capital (see for example Verrecchia (2000)). Alternatively, one can argue that more public disclosure may result in less liquid markets if more public disclosure makes private information acquisition cheaper. This line of reasoning is for example followed in Barth et al. (1999).

dend or nothing at all minus a cost if the firm chose to finance publicly. This cost may represent audit costs, investment banker's fees, disclosure costs or a combination of these costs. Let this cost be a fixed proportion of the terminal dividend by definition.

Let  $P(\pi_i)$  denote the current price of a publicly issued share of firm *i* with payment probability  $\pi_i$ , where the payment probability is defined on the interval  $[\pi, \overline{\pi}]$ .<sup>19</sup> If *D* denotes the terminating dividend of the share, the expected payoff of a public share to investors equals

$$\pi_i D(1-p) + (1-\pi_i)0$$

where p is the proprietary cost expressed as a percentage of the terminating dividend. Note that the proprietary cost is a fixed proportion of the terminating dividend, but that this cost varies with the firm's payment probability. Since investing in the risk-free asset yields the return 1 + r, the current price of the public share  $P(\pi_i)$  is such that

$$\frac{\pi_i D(1-p)}{P(\pi_i)} = 1 + r$$

Rearranging terms yields

$$P(\boldsymbol{\pi}_i) = \frac{\boldsymbol{\pi}_i(1-p)}{1+r} D.$$

Note that, as one may expect, the share price increases as the payment probability increases.

Since only firms that issue publicly can credibly disclose their type, private investors cannot determine the payment probability of a privately offering firm precisely. Furthermore, private issues are exempt from proprietary costs by definition. For private shares, let a denote the expected payment probability and let S denote the required return. Then a private share yields the payoff

<sup>&</sup>lt;sup>19</sup> The term  $(1-\pi_i)$  represents the probability of default.

$$aD + (1 - a)0$$

so that the price S is such that

$$\frac{aD}{S} = 1 + r$$

Rearranging terms yields

$$S = \frac{a}{1+r}D.$$

Given the prices for public and private shares, a firm with payment probability  $\pi_i$  issues equity capital publicly if  $P(\pi_i) \ge S$  and privately otherwise.

Next, suppose that a firm with payment probability  $\pi_i$  issues public shares, that is  $P(\pi_i) \ge S$ . Since we derived that the share price  $P(\pi_i)$  increases as payment probability  $\pi_i$  increases, all firms with payment probability  $\pi'_i > \pi_i$  also issue shares publicly. Similarly, if a firm with payment probability  $\pi_i$  issues private shares, i.e.  $P(\pi_i) < S$ , then all firms with payment probability  $\pi'_i < \pi_i$  also issue private shares. Hence, if both public and private shares coexists, there is some critical "cut-off" issuer  $\pi^*_i$ , so that all firms  $\pi'_i$  with  $\pi'_i < \pi^*_i$  issue privately and all firms  $\pi'_i$  with  $\pi'_i > \pi^*_i$  issue publicly.

Since the firms with payment probability  $\pi'_i < \pi^*_i$  issue private shares, private investors' beliefs regarding the expected payment probability *a* equals

$$a = \int_{\underline{\pi}}^{\pi} \pi f(\pi) d\pi$$

where  $f(\pi)$  denotes the probability density function that describes the continuous probability distribution of the payment probabilities. The corresponding price for private shares then equals

$$S = \frac{a}{1+r}D = \frac{\int_{\pi}^{\pi} \pi f(\pi) d\pi}{1+r}D.$$

The cut-off issuer  $\pi_i^*$  is by definition indifferent between issuing public or private shares, so that  $P(\pi_i^*) = S$ . Hence,

$$\frac{\pi_i^*(1-p)}{1+r}D = \frac{\int_{\pi}^{\pi^*} \pi f(\pi) d\pi}{1+r}D.$$

Rearranging terms then yields that

$$\pi_i^*(1-p) = \int_{\underline{\pi}}^{\underline{\pi}^*} \pi f(\pi) d\pi = a \, .$$

This equation is a necessary condition for  $\pi_i^*$  to be an equilibrium partition point.<sup>20</sup>

The model (that is illustrated in Figure 3.1) assumes that private issuers cannot credibly reveal their payment probability to investors. Therefore, the equilibrium private capital cost is based on the expected payment probability of the total group of private issuers. If the group of private issuers is not empty, it has been shown that it will still consist of the lowest quality issuers for these issuers have the highest incentive to conceal their true quality in an attempt to get pooled with issuers of higher quality. The higher quality issuers, however, have an incentive to reveal their true nature to avoid pooling with the lower quality issuers. If there

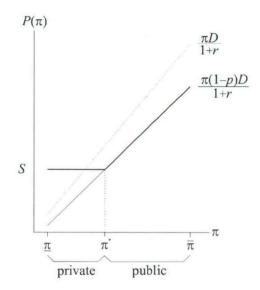


Figure 3.1: A partial financing equilibrium: the base case

were no disclosure costs, all issuers in the former setting want to make themselves known, except perhaps for the lowest quality issuer who is indifferent. Consequently, there will be a full public financing equilibrium. This result is an outcome of the unraveling theorem discussed in Chapter 2 that occurs in all cases where the uninformed party knows his counterparty in a transaction to be asymmetrically informed and credible disclosure is costless.

In the model, however, disclosure is not costless but yields a proprietary cost that varies with the payment probability  $\pi_i$ . In the event of a cost difference, firms of lower quality are offered the opportunity to hide behind firms of a better quality for which the adverse selection cost is too low to compensate for the disclosure cost. Thus, the existence of a cost differential introduces a group of issuers that conceals its private information and consequently stays

<sup>20</sup> Sufficient conditions for the existence of a cut-off issuer are: 
$$\int_{\pi}^{\overline{\pi}} \pi f(\pi) d\pi < \overline{\pi} (1-p) \text{ and } 0 < \underline{\pi} < \overline{\pi} < 1.$$

private. This group of issuers is of the lowest quality. The size of this group depends on the height of the cost and the distribution of the private information.

Summarizing, if issuers can only reveal their true quality by going public and if going public induces an additional cost, the better firms have the highest incentive to go public in order to prevent the adverse selection cost related to private financing. This outcome coincides with the disclosure model of Verrecchia (1983). In this model the friction that eventually stops the unraveling process is caused by a fixed (disclosure) cost, and in this model the lowest quality types are silent, too. The main difference between our and Verrecchia's model is that our model considers two different capital markets to focus on the financing decision, where disclosure and nondisclosure is strictly related to the capital market type, whereas Verrecchia focuses solely on the disclosure strategy and distinguishes only one capital market. Furthermore, in Verrecchia's model the disclosure cost does not vary with the quality of the private information, whereas in our model it does. However, the silent firms in Verrecchia can be seen as the private issuers in our model, so the distinction between the two models is not really fundamental. Although the model elaborated on in this section can be seen as a version of Verrecchia's disclosure model, we present it in a different context and show that if the model is used to explain the going-public decision, it implies that private issuers conceal their proprietary information towards private investors.

#### 3.4 Introducing a variable proportional proprietary disclosure cost

Next let us consider a proportional proprietary disclosure cost that varies with the quality of the issuer. Remember that in the model in Section 3.3 the proprietary disclosure cost equals a fixed proportion of the terminal dividend and is only incurred if the firm goes public. In this section we want to represent the proportional disclosure cost as a function of the payment probability, since higher quality issuers are likely to suffer higher proprietary costs than lower quality issuers if they disclose their proprietary information publicly. Hence, we want to model a positive relation between the issuer's quality and the height of the proportional proprietary cost. We maintain the assumption of selective credible disclosure; and to make this difference explicit in the model, we maintain a fixed disclosure cost associated with making the public disclosure credible. Consequently, firms that go public in this adjusted setting do not just have to weigh the benefit of avoiding the adverse selection cost against a fixed disclosure.

sure cost but also against a variable proprietary cost. Conditional on the height of the proprietary cost, issuers that initially preferred to go public may now want to stay private. This tendency will be the highest for the highest quality issuers, because they face the highest proprietary cost. For the lowest quality issuers not much has changed because the proprietary cost arising from going public is rather low. In fact, their incentive to stay private will even be higher, because of this additional cost of going public.

More formally, the adjusted model as discussed in the previous paragraph can be presented as follows. Again,  $P(\pi_i)$  denotes the current price for a publicly issued share of a firm with payment probability  $\pi_i$ , and D is the terminating dividend. The end-of-period payoff of a public share can be defined as

$$\pi_i D(1-p(\pi_i))(1-q) + (1-\pi_i)0$$

where  $p(\pi_i)$  is the proportional proprietary cost as a function of the payment probability and q the fixed disclosure cost expressed as a percentage of the dividend. Investing in the risk-free asset yields the return 1 + r, so the current price of the public share  $P(\pi_i)$  is such that

$$\frac{\pi_i D(1 - p(\pi_i))(1 - q)}{P(\pi_i)} = 1 + r$$

Rearranging terms yields

$$P(\pi_i) = \frac{\pi_i (1 - p(\pi_i))(1 - q)}{1 + r} D.$$

To give concrete form to the presumed positive association between quality and proprietary costs, let the proprietary cost be proportional to the payment probability, that is  $p(\pi_i) = p\pi_i$ . Hence the current share price of a publicly offered share is

$$P(\pi_{i}) = \frac{\pi_{i}(1 - p\pi_{i})(1 - q)}{1 + r}D$$

Compared to the price of public share derived in the previous section, where the share price was modelled as a linear function of the payment probability, we have now defined the public share price as a concave function of the payment probability. More specifically,  $P(\pi_i)$  is a

parabolic function that increases for  $\pi_i \leq \frac{1}{2p}$  and decreases for  $\pi_i \geq \frac{1}{2p}$ . For private issuing

firms nothing has changed, so that the price for a privately offered share can still be defined as an average price. Hence, we can distinguish two marginal indifferent issuers. Again, we can have an indifferent issuer in the lower region of the distribution, for whom the undervaluation disadvantage of private financing equals the (credibility) disclosure costs of public financing. In addition, there may be a second indifferent issuer in the upper region. For this second indifferent issuer the proprietary cost related to public financing could become so high that it exceeds the undervaluation disadvantage of private financing.

Suppose a firm with a relatively low payment probability  $\pi_i$ , issues private shares, that is  $P(\pi_i) < S$ . Since we have derived that for relatively low quality firms, i.e.  $\pi_i \leq \frac{1}{2p}$ , the share price  $P(\pi_i)$  decreases as the payment probability decreases, all firms with payment probability  $\pi_i < \pi_i$  also issue shares privately. Next, suppose that a firm with a relatively high payment probability  $\pi_h$ , issues shares privately, that is  $P(\pi_h) < S$ . Since we derived that for relatively high quality firms, i.e.  $\pi_h \geq \frac{1}{2p}$ , the share price decreases as the payment probability increases, all firms with payment probability  $\pi_i > \pi_h$  also issue shares privately. For values of the payment probability for which it holds that  $\pi_i < \pi_i < \pi_h$ , it must be true that  $P(\pi_i) \geq S$ .

If this setting describes an equilibrium financing strategy,<sup>21</sup> the average payment probability for all private issuers can be defined as

<sup>&</sup>lt;sup>21</sup> Necessary conditions for the existence of an equilibrium (as depicted in Figure 3.2) in which the lowest and highest quality issuers stay private and issuers of moderate quality go public are: p > 0.5 and  $E(\pi) < \frac{1-q}{4p}$ . If, namely,  $p \le 0.5$  the function describing the price of a public share,  $P(\pi_i)$ , is not parabolic, so  $\pi_h$  cannot exist; and if  $E(\pi) \ge \frac{1-q}{4p}$  the function describing the price of a private share, *S*, will never cross the function describing the price of a private share, *S*, will never cross the function describing the price of a private share, *S*, will never cross the function describing the price of a private share, *S*, will never cross the function describing the price of a private share, *S*, will never cross the function describing the price of a private share, *S*, will never cross the function describing the price of a private share, *S*, will never cross the function describing the price of a private share, *S*, will never cross the function describing the price of a private share, *S*, will never cross the function describing the price of a private share share.

$$a = \int_{\underline{\pi}}^{\pi_l} \pi f(\pi) d\pi + \int_{\pi_h}^{\overline{\pi}} \pi f(\pi) d\pi$$

and the equilibrium price of a private share as

$$S = \frac{a}{1+r}D = \frac{\int_{\pi_{1}}^{\pi_{1}} \pi f(\pi) d\pi + \int_{\pi_{k}}^{\pi} \pi f(\pi) d\pi}{1+r} D.$$

The cut-off issuers  $\pi_i$  and  $\pi_h$  are by definition indifferent towards issuing public or private shares so that  $P(\pi_i) = P(\pi_h) = S$ . Hence,

$$\frac{\pi_{l}(1-p\pi_{l})(1-q)}{1+r}D = \frac{\pi_{h}(1-p\pi_{h})(1-q)}{1+r}D = \frac{\int_{\pi_{h}}^{\pi_{l}}\pi f(\pi)d\pi + \int_{\pi_{h}}^{\pi}\pi f(\pi)d\pi}{1+r}D.$$

Rearranging terms then yields that

$$\pi_{l}(1-p\pi_{l})(1-q) = \pi_{h}(1-p\pi_{h})(1-q) = \int_{\underline{\pi}}^{\pi_{l}} \pi f(\pi) d\pi + \int_{\pi_{h}}^{\overline{\pi}} \pi f(\pi) d\pi = a.$$

The general form of the possible equilibria financing strategies is illustrated in Figure 3.2.

Summarizing, if corporate issuers can only make themselves known to investors through a costly audited report that also induces a proprietary cost that increases with reported quality, the following equilibrium financing strategy may emerge: issuers of medium quality go public and disclose their private information, whereas low and high quality issuers stay private and are silent. Low quality issuers prefer to stay private and be silent, because by doing so they will get overvalued. High quality issuers stay private if the proprietary cost linked to going public is higher than the undervaluation cost in the event of private financing. This result is similar to Wagenhofer (1990), where one of the equilibrium disclosure strategies features a similar segmentation of informed parties in a transaction. The model presented in this section derives this essentially more interesting segmentation in a simpler fashion. Hence, similar to Verrechia's model, if the model of Wagenhofer is applied to the going-public decision, we assume that proprietary information is withheld from private investors.

bing the price of a public share, so  $\pi_l$  as well as  $\pi_h$  cannot exist. However, these conditions need not be sufficient.

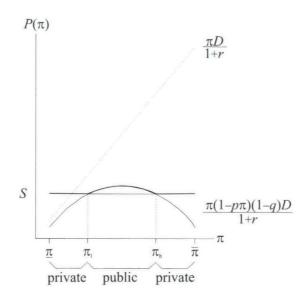


Figure 3.2: A partial financing equilibrium with variable proprietary costs

## 3.5 Credible disclosure in both capital markets

The results in the previous two sections rely heavily on the assumption that issuers cannot credibly disclose their type in a private capital market. The idea behind this assumption is that auditors would lack standards to comply with in private capital markets and that private issues are not warranted by investment banks. In a setting without an agency conflict between corporate issuers and investors, however, private investors are likely to be able to assess the quality of a particular issuer. For would it be plausible to assume that a specialized private investor like a venture capitalist cannot assess the issuer's type when agency problems do not exist? A venture capitalist, namely, can read the same financial reports as the issuer does and it can study the firm from the inside if it wishes to do so. Furthermore, a specialized private investor may well know how to evaluate firms and will be aware of the product market prospects of the particular industry in which the firm is competing. Even if there were agency problems between private issuing firms and their investors, it is conceivable that disclosures

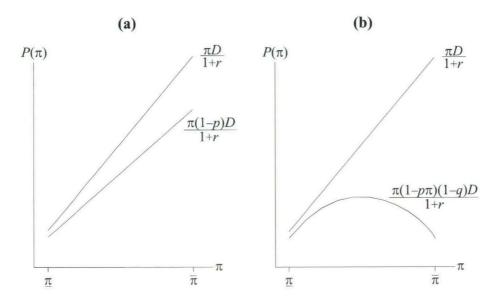


Figure 3.3: Full private financing equilibria when credible disclosure is possible in both capital markets

by private firms can be audited, too.<sup>22</sup> Therefore, from now on we assume that credible disclosures are possible in public as well and private capital markets. The most distinguishing feature between both capital markets now becomes the fact that private issuers only have to communicate with one or just a few (private) investors, whereas public issuers have to communicate in public with a much larger number of unknown investors.

When credible disclosure is possible in both public and private capital markets, the "informational advantage" (Melnik and Plaut, 1994) of public markets compared to private markets vanishes. As a result, the segmentation of the financial capital market as put forward in the previous sections disappears. Since only public disclosures are costly (or more costly than private disclosures, i.e. disclosures to private investors), no firm will finance publicly in the models presented in the previous two sections (except perhaps for the worst firm who may be indifferent), as is illustrated in Figure 3.3.

<sup>&</sup>lt;sup>22</sup> Unlike in the United States, it is difficult to claim that the European Union member states lack audited disclosure standards in private capital markets, for the requirement to audit financial reports depends on firm size and not on listing status (see Chapter 5 for an elaboration on this point).

This result seems rather unsatisfactory, because it would imply that no issuer would enter the public capital market. However, other than disclosure cost differences between public and private capital markets exist that can introduce an interesting friction in the present model. In Section 3.2 a list of factors has been documented that may influence the decision to go public. The general notion is that public capital markets offer low-cost financing opportunities but that information and incentive problems may favor private financing. One of the information problems that may render private financing more attractive is the possible leaking of proprietary information, which is the central issue of this thesis. Other possible economic tradeoffs in this respect are not specifically addressed in this thesis.<sup>23</sup> To account for these concurrent reasons we will consider in the remainder of the thesis both the case that, apart from (proprietary) disclosure costs, public capital is cheaper than private capital and the reverse case.<sup>24</sup>

To distinguish differences in disclosure costs between public and private capital markets from other cost differences, we introduce a variable referred to as the "capital cost differential". This variable, thus, together with the difference in disclosure costs – which in this context may be referred to as the "disclosure cost differential" – drives the firm's financing decision, which we have defined as the decision to go public or stay private. For the same reason we want to distinguish in this thesis between capital and financing costs: capital costs include all financing costs except disclosure costs.

If we adhere to the common notion that private capital is generally more expensive than public capital, we can get a result as presented in Figure 3.4. Figure 3.4 shows a possible equilibrium capital market segmentation if the liquidity and diversification advantage of public capital can be represented by a fixed capital cost differential.

<sup>&</sup>lt;sup>23</sup> The exception is Appendix 3.A which extends the model presented in this section by including an agency cost related to public financing.

<sup>&</sup>lt;sup>24</sup> Yosha (1995) for example, who studies the same issue as we do, assumes public capital to be more costly than private capital. Under the assumption that flotation costs of public placements are higher and for a large part fixed, the former conjecture may well be true for small firms or small issues. In our model, however, we assume that the placement is large enough to make a public issue interesting and that all issuers want to issue the same amount of capital. Because we are particularly interested in the effect of proprietary disclosure costs on the issuing decision, we have chosen not to incorporate this additional level of complexity in the model.

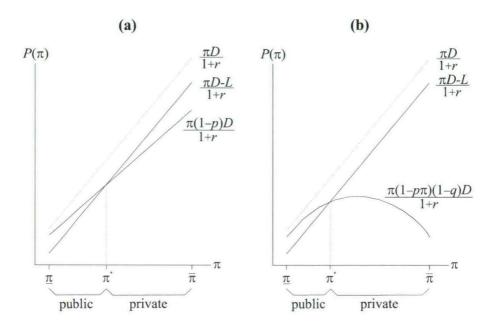


Figure 3.4: Partial financing equilibria when public capital is cheaper than private capital

The resulting equilibrium segmentation is the mirror image of the one found in Section 3.3 (that is illustrated in Figure 3.1), where only public investors can disclose their identity at a fixed cost. In the present case the worst firms rather than the better ones seek public equity financing. The proprietary disclosure cost acts as a barrier for the better firms to entering the public capital market. These firms are willing to pay the higher capital cost related to private financing if this means that they can avoid the proprietary cost.

In this section we have shown that relaxing the assumption of selective credible disclosure, i.e. the possibility to only disclose one's private information by going public, dramatically changes the results. When issuing firms can disclose their true value to both types of investors, which is a more plausible assumption, it is the relatively bad rather than the relatively good firm that seeks public financing. In the next section we will further elaborate on the influence of proprietary disclosure costs on the decision to go public by adjusting the role of the opponent.

#### 3.6 A game-theoretic exploration

In the previous analyses of the interdependence between the going-public and disclosure decision, costs were represented as being exogenous. For example, going public meant that a firm entailed an auditing cost and a proprietary cost. Thus, all the previous representations of the problem assume that costs were incurred only if the firm undertook a particular action. With respect to the costs that are directly related to going public, like auditing costs, investment bankers' and listing fees, the assumption seems to be plausible. However, with respect to the proprietary cost the assumption is not that plausible.

The idea that proprietary costs are to be borne by every firm that goes public is rather restrictive. Adverse actions by opposing parties are of a more discrete nature. First, it may be that an opponent, such as a product market competitor, is faced with a barrier. Before it is attractive to respond to the actions of an issuing firm, the disclosed information needs to be of a certain quality. For example, a firm that goes public and discloses that it follows industry standards in every respect, is less likely to fear an opposing action by a competitor than a firm that reveals that it has developed a new product that will considerably change market relations in its industry. Furthermore, a possible reaction by an opponent does not need to be proportional to the quality of information. The adverse action by an opponent can also be presented by a fixed cost.

In this section we introduce proprietary disclosure costs by a discrete action of an opponent, following Wagenhofer (1990). We assume that the opponent – a product market competitor – will only take an adverse action if the disclosed information is of a certain quality (to compensate for the costs he has to make) and that this action imposes a fixed proprietary cost on the disclosing firm. Since we want to concentrate on the effect of the proprietary cost related to disclosure, we ignore other disclosure costs. We maintain the assumption that public corporate issuers have to disclose their private information truly, and that staying private (which is similar to non(public) disclosure under the present assumptions) will not lead to proprietary costs per definition. Hence, a firm that considers a public or private issue still has to weigh the capital cost differential against the proprietary disclosure costs. But contrary to the model discussed in the previous section, the (fixed) proprietary disclosure cost is not mechanically imposed on firms that go public.

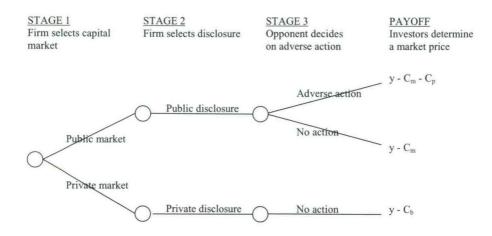


Figure 3.5: An extensive-form game tree when public financing entails a discretionary proprietary cost

The financing and disclosure setting that is presently being considered can be presented by an extensive-form game tree as illustrated in Figure 3.5. At the beginning of the game the corporate issuer has to decide on which capital market to issue its shares: the public or the private capital market. A public placement entails a cost  $C_m$  and a private placement a cost  $C_b$ . At the subsequent stage the corporate issuer has to disclose its private information y,<sup>25</sup> if he chooses a public placement, otherwise he can be silent. Next, the opponent decides on his adverse action. If the firm goes public and if the mandated disclosure exceeds a certain threshold value, K, the opponent undertakes the adverse action resulting in a proprietary cost,  $C_p$ , for the issuing firm. In all other cases, no proprietary cost will be imposed. The game ends when the capital market has determined a unanimous market price for the firm based on all former actions of the other players. A summary of the notation used in this section is given in Table 3.1.

 $<sup>^{25}</sup>$  From now on private information is denoted by the symbol *y*. This symbol represents the gross end of period payoff, that is the payoff excluding financing and disclosure costs. This end of period payoff can be the terminal dividend as presented in the former sections.

Variable	Definition
y	End of period payoff excluding financing and disclosure costs
$C_b$	Private capital cost
$C_m$	Public capital cost
$C_b - C_m$	Capital cost differential
$C_p$	Proprietary cost
K	Threshold value
F(y)	Probability distribution of private information y

**Table 3.1: Parameter definition** 

For the outcome of the game it is important to know at which stage the private information is revealed to the corporate issuer. Let us first consider the case in which the asymmetric information is created at the beginning of the first stage. This means that the firm learns the private information *before* it makes the issuing decision. Thus, under these circumstances the issuing firm has no uncertainty whatsoever about the consequences of its financing choice. Hence, the outcome of the game is straightforward. Assuming that public capital is cheaper, that is  $C_m < C_b$ , all firms want to issue publicly except those firms that must bear the proprietary cost and for which the proprietary cost exceeds the capital cost differential. It appears that these latter firms are the relatively good firms. An elaboration of this result is illustrated in Figures 3.6a en 3.6b, in which it is assumed that the private information is uniformly distributed over the interval  $[\underline{y}, \overline{y}]$  and that the value of the firm is a direct function of the quality of information. Figure 3.6a shows the result for values of the proprietary cost that exceed the capital cost differential, while Figure 3.6b shows the consequences to value of the firm for the opposite case. Obviously, all firms prefer private financing in the present setting if public capital is more expensive than private capital.

Let us now consider the case in which the issuing firm learns the private information at the beginning of the second stage, i.e. *after* it has decided on the method of financing. In this case, the issuing firm is uncertain about the consequences of its issuing decision on the proprietary disclosure cost. If the firm goes public, it has to disclose its private information but because the adverse action of the opponent is discrete, the firm needs not automatically incur the proprietary cost. Since the private information is learned after the financing decision is made, the issuer can only form expectations on the consequences of the issuing decision. Since the distribution of private information is assumed to be the same to all issuing firms, all

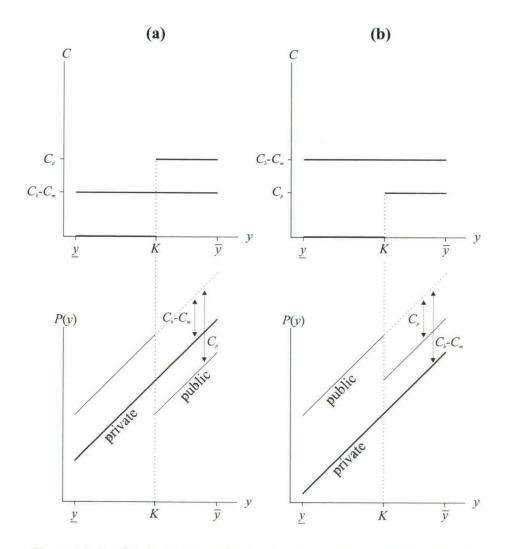


Figure 3.6: Possible financing equilibria when the capital cost differential is lower (a) and higher (b) than the proprietary cost

firms are similar at the first stage. As a result, all firms make the same issuing decision, yielding only fully separating financing equilibria: either all firms go public or all stay private conditional on the values of the exogenous variables. If the exogenous variables are such that the expected proprietary disclosure cost exceeds the capital cost differential  $C_b - C_m$ , all firms

will remain private and thus will not disclose. In all other cases a full public financing and full disclosure equilibrium will occur.<sup>26</sup>

So far, the behavior of the opponent is only taken into account when the firm issues publicly. The possibility of an adverse action by the opponent in case of a private issue is ignored. This, however, yields the following inconsistency. Assume that there would be an equilibrium in which the relatively good firms issue privately to avoid proprietary costs, and only firms that possess private information below the opponent's threshold value issue publicly. In such cases, the opponent can infer that privately issuing firms possess high quality information. Although the opponent does not precisely know what information a privately issuing firm possesses, he can infer that it exceeds his threshold value. Hence, it would be beneficial for the opponent to take the adverse action when he observes a private issuing firm. To resolve this inconsistency, we extend the action space of the opponent, so that based on his beliefs about the private information of a privately issuing firm he may decide to take the adverse action when observing private issuing. This amended play is illustrated in the extensive-form game tree of Figure 3.7.

We know that if the firm learns about its private information at the beginning of the second stage, all firms make the same issuing decision, for all firms are similar in the first stage. If the opponent's beliefs are such that he refrains from taking the adverse action upon observing nondisclosure, all issuers go private if the expected proprietary disclosure cost adhered to public financing exceeds the additional cost of private capital; they go public if the opposite is true. In both cases all firms stay private if public capital is more costly than private capital. These results are summarized in Table 3.2a.

Table 3.2a: The choice of financing if private information is revealed in the second
stage and the opponent refrains from an adverse action with nondisclosure

Proprietary cost disadvantage of public financing related to the capital cost differential	$C_b > C_m$	$C_m > C_b$
$E(C_p) \leq (C_b - C_m)$	Public	Does not occur
$E(C_p) > (C_b - C_m)$	Private	Private

<sup>&</sup>lt;sup>26</sup> If private capital is cheaper than public capital, a full private financing equilibrium will occur. Proprietary cost considerations will only strengthen this conjecture.

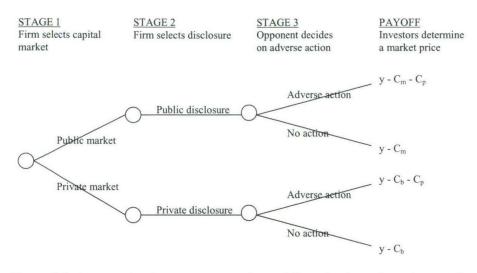


Figure 3.7: An extensive-form game tree when public and private financing entail a discretionary proprietary cost

If the opponent's prior beliefs are such that he imposes the proprietary cost on privately issuing firms, we get the following results. All issuers prefer to go public if public capital is cheaper than private capital, for private issuing yields proprietary costs with certainty, whereas public issuing may avoid proprietary costs (namely, if the disclosed information does not exceed the threshold value of the opponent). If public capital is more costly than private capital, all firms issue publicly if the expected benefit of no proprietary costs exceeds the extra costs of public capital; they go private if the opposite is true. The latter results are shown in Table 3.2b.

As has been shown earlier, for the financing decision to be informative about the quality of the firm and to get partially financing equilibria, private information must be revealed to the

Table 3.2b: The choice of financing if private information is revealed in the second stage and the opponent takes an adverse action with nondisclosure

Proprietary cost advantage of public financing related to the capital cost differential	$C_b > C_m$	$C_m > C_b$
$C_p - E(C_p) < (C_m - C_b)$	Does not occur	Private
$C_p - E(C_p) > (C_m - C_b)$	Public	Public

issuing firm before it has to decide on its method of financing, i.e. at the beginning of the game. In such case, the opponent can use the outcome of the issuing decision to update his beliefs in case of nondisclosure. If private placements incur an extra capital cost, a firm that issues its securities privately will only do so if it can thus avoid the proprietary cost that would have been imposed if it had gone public. But because the opponent can infer that with higher costs of private financing private issues can only be driven by an attempt to avoid the proprietary cost, he will take an adverse action when observing private financing. As a result, the private capital market loses its "information sheltering advantage", and a full public financing equilibrium will emerge. This result applies to all possible threshold values. Hence, if public capital is cheaper than private capital, all firms want to go public except those that want to keep their informational lead. However, by staying private the opponent learns as much as when the firm would have gone public and therefore there is no way in which an issuing firm can keep its informational lead.

Now let us consider the case in which public capital is the more expensive source of capital. In such case, all firms have an initial preference for private financing. Only for values of the proprietary cost above the capital cost differential and for prior beliefs of the opponent that justify an adverse action if he observes private financing, the initial preference changes for a low-quality firm. This issuer will opt for the more expensive capital source in order to disclose to the opponent that it is in the opponent's best interest not to undertake the adverse action. High-quality firms, more specifically firms endowed with private information that exceeds the opponent's threshold value, will stay private and incur the proprietary cost. Going public would only increase their financing cost. Instead, if the opponent does not act adversely upon observing private financing, there is no reason for any firm to reveal at a cost its true identity to the opponent, and thus a full private financing equilibrium results. For values of the proprietary cost that are lower than the incremental public financing cost, the action of the opponent does not influence the equilibrium financing strategy. All firms prefer private financing, even if the opponent were to impose the proprietary cost with private financing, because the cost for an inferior issuer to reveal its true identity would exceed the benefits of it in all cases. Thus, we can observe an equilibrium in which all firms finance privately and all bear the proprietary cost. Table 3.3 summarizes the results of the comparative statics just described.

 Table 3.3: The choice of financing if the private information is revealed at the first stage and the opponent may undertake an adverse action with nondisclosure

Proprietary cost advantage of public financing related to the capital cost differential	$C_b > C_m$	$C_m > C_b$
$C_p - E(C_p) \leq (C_m - C_b)$	Does not occur	Private
$C_p - E(C_p) > (C_m - C_b)$	Public	All private, if $E(y) < K$ . Superior firms private and inferior firms public, if $E(y) > K$ .

In this section, a first step has been made in developing a formal model in which the influence of proprietary disclosure costs on the going-public decision is analyzed elaborately. It has been shown that for the financing decision to say anything about the firm's quality and hence to get partially financing equilibria, information asymmetry must occur before the issuing firm decides on its method of financing. However, in such case the subsequent disclosure decision is merely a consequence of the financing decision. To separate more clearly the financing from the disclosure decision, we want to incorporate an additional source of private information into the present model.

# 3.7 A further extension: an additional source of private information

So far, the analysis has been centered around one source of private information of a firm that has to decide on which capital market to issue its new shares in the presence of different disclosure regimes and an opponent that may impose proprietary costs. Conditional on the firm's issuing and subsequent disclosure decision, the capital market investors and the opponent learn about the firm's value and a market price for the firm's shares is determined. The firm's goal is to maximize this market price weighing capital and disclosure costs against each other.

In this section we will take a closer look at the representation of the information asymmetry between the issuing firm and the outside interested parties. In the previous analysis the information asymmetry was fed by knowledge of the firm's prospects. Issuing firms were endowed with this knowledge and had an incentive to disclose it to investors in order to get an as high as possible price for their shares. There were two options for issuing firms: they could go public and disclose their private information publicly by mandate or they could go/stay private and disclose the information privately. The choice of financing depended on a capital cost differential and a proprietary disclosure cost that might be imposed by an opponent. The firm's disclosures are assumed to be credible. This credibility feature stems from the possibility to audit and warrant the private information. In case of private financing, private investors can be informed privately of the content of the proprietary information, because they are few in number and they are known to the firm. Public investors, on the other hand, cannot be informed personally. First, because they are unknown to the firm: and second, because if they were known, there would be too many of them for the firm to privately inform all at the same time. We assume that it is not in the firm's best interest to create information asymmetry across its public investors. Besides, public capital market authorities almost always forbid it. Hence, public investors can only be informed publicly. However, by disclosing publicly opponents also learn the firm's proprietary information and they can act accordingly.

In modeling the financing/disclosure game it turned out to be important at which stage the private information was revealed to the issuing firm. If the private information is learned after the financing decision is made, all firms are equal at the moment they choose between capital markets and consequently all firms make the same decision. More interesting is the case in which issuing firms get informed before the financing decision is made. Now segmentation between private and public issuers can be established, which makes the model more interesting. However, it is conceivable that not all information asymmetry between issuers and outside investors is resolved after an initial public or private offering and after the subsequent disclosure. This remaining uncertainty is the subject of this section.

A firm's market price can be divided into a part that reflects the present value of assets in place and a part that contains the present value of growth opportunities.<sup>27</sup> Information about the value of the firm's assets in place is more easily audited and warranted because the value drivers are easier to observe and therefore this type of private information is easier to disclose credibly. Obviously, private information about a firm's growth opportunities is more difficult to audit and warrant. Many factors may affect a firm's growth opportunities. Some of these factors can well be observed such as industry and economy-wide characteristics: others can-

<sup>&</sup>lt;sup>27</sup> Cf. Myers (1977).

not be observed that easily, such as specific technologies, know-how and capabilities of the firm and its employees.

We want to incorporate the distinction between type of value-relevant information by introducing in the model an additional mechanism that generates private information. We assume that private information about growth opportunities is revealed to the issuer before he has to decide on the method of financing. The private information informs the issuer about its prospects in the next period, say about the possibility of receiving good information in the second stage of the game. This information structure can be represented as a firm that needs outside financing to start a project of which the profitability must show in a next stadium, i.e. after the issuing decision is made. Realized profits can be audited and therefore can be disclosed credibly, unlike the information about the expected success rate of the project at the issuing stage. The only way in which the issuer can communicate any private information about its capacity of generating future profits is by strategically making its financing and disclosure decision.<sup>28</sup>

By introducing the additional set of private information the firm's financing and disclosure decision are more separated from each other. The firm's financing decision is now based on private information about its profit generating capacity, and the disclosure decision involves the disclosure or nondisclosure of a verifiable piece of proprietary information, say a realized profit figure. In the remainder of this section we will clarify the extended model by presenting an example.

Recall the example illustrated in Figure 3.6a. In this example a firm has to decide on the method of financing in a setting where the proprietary cost exceeds the additional cost of private capital, i.e.  $C_b > C_m$ , and the opponent imposes the proprietary cost if and only if the issuing firm discloses information that exceeds the threshold value. Let us now extend this setting and introduce the additional uncertainty as discussed in the previous paragraphs. Let the firm's private information about its growth potential take on two possible values: the firm can have a low or a high growth potential. More precisely, the firm's growth potential will be

<sup>&</sup>lt;sup>28</sup> Although the information about a firm's growth opportunities cannot be audited, the promoters of a public issuing firm can still warrant it. We abstract from this possibility here, assuming that an investment banker is unable to completely eliminate the information asymmetry. Hence, the adverse selection problem relevant to our analysis remains, although it might not be as strong as initially supposed.

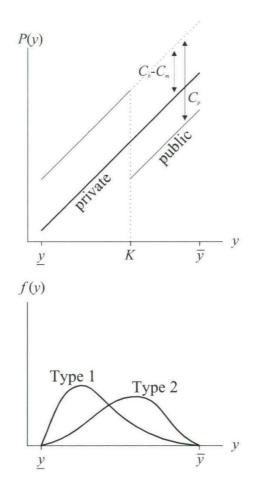


Figure 3.8: Introducing noise in the financing decision by an additional source of private information

described by the probability distribution of its private information, where the probability that a high potential firm receives relatively good information stochastically dominates the probability that a low potential firm receives the same information. The low potential firm is denoted as a type 1 firm and the high potential firm as a type 2 firm. A firm knows its type before it makes its issuing decision and, as discussed above, this information cannot be disclosed credibly to either investor. In the second stage of the game the firm receives a verifiable piece of private information. The relation between both sources of private information is that the better a firm's type, the higher its chances are on receiving good information in the second stage. Based on the issuing decision made in the first stage of the game, a firm that has gone public has to disclose this verifiable piece of private information whereas a private firm withholds it.

Possible market prices for both firm types and for both capital markets are shown in Figure 3.8. If the opponent does not update his beliefs when he observes nondisclosure, it is obvious that good firms (type 2 firms) have a higher incentive to finance privately than bad firms (type 1 firms). In case the opponent does update his beliefs if he observes nondisclosure, which equals private financing in the present model, his inferences will be based not only on the information revealed by disclosing firms but also on information about which type of firm most likely prefers silence. Hence, the expected value of the proprietary information and on the distribution of firm types. In this example with only two different firm types, inferences are readily made. There may be three different outcomes: a full private, a full public, or a partial financing equilibrium where one type prefers public financing while the other prefers private financing. In the next chapter we will elaborate on this setting by introducing a richer set of firm types and allowing for voluntary disclosure for publicly as well as privately financed firms.

# 3.8 Summary

In this chapter we have explored the possible relationship between corporate disclosure and financing. After having discussed the discretionary disclosure models in Chapter 2, Chapter 3 puts them into a financing perspective. If public and private capital markets have different disclosure environments and disclosure comes with costs and benefits, the decision to go public is related to disclosure opportunities.

Since we are aware that the choice of financing publicly or privately may depend on other than disclosure considerations, we start this chapter with an overview of the different considerations that may govern this financing decision. We conclude that there is consensus that public capital markets provide firms with low-cost financing opportunities, but that this benefit may be overridden by incentive or information problems. One such information problem is what we refer to as the problem of leaking proprietary information. The analysis of the influence of the possible leakage of proprietary information that may occur once the firm seeks contact with outside financiers starts with a model that has much in common with Verrecchia's (1983) disclosure model discussed in Chapter 2. If we may assume that public disclosures are credible and private disclosures are not credible, and public disclosures entail a fixed proprietary cost, a threshold for public financing occurs similar to Verrecchia (1983). Firms with proprietary information above the threshold go public and disclose this information at a cost, whereas firms with proprietary information below the threshold stay private and do not disclose, and consequently get pooled.

If we extend this model by dividing the disclosure cost in a fixed component that is independent of the quality of proprietary information and a component that varies with this quality, we derive a model that bears resemblance to Wagenhofer's (1990) model discussed in the previous chapter. As Wagenhofer, this model predicts that firms of high quality too may prefer nondisclosure to protect their proprietary information and thus, under the presumed conditions, stay private.

Although the outcome of the second model may be more satisfactory than the outcome of the first model, the assumption that credible disclosure is only possible in public markets is questionable. Therefore, we relax this assumption in the third model discussed in this chapter. However, by removing the "informational advantage" of public capial markets with respect to private capital markets, we lose the counterweigh to the (proprietary) disclosure cost argument. Instead, we introduce a cost differential between public and private financing that is caused by other that disclosure cost arguments. This difference is referred to as the capital cost differential to distinguish it from the other financing cost argument: the disclosure cost differential. If the capital cost differential is in favor of public capital, we find that for both specifications of disclosure costs (i.e. the first and the second model discussed in this chapter) the lowest quality firms go public if a segmentation of the capital market occurs.

We proceed by further investigating the role of proprietary costs and represent its influence by a discrete action of an opponent conform Wagenhofer (1990). Furthermore we consider the nature of the capital cost differential and consider both the case in which public capital is cheaper than private capital and the reverse case. Finally we study the timing of the information asymmetry by looking at two cases: the case in which the issuing firm is asymmetrically informed before and the case in which the firm is informed after the issuing decision is made.

These three extensions of the third model are elaborated on in Section 3.6. Representing the proprietary cost by a discrete action of an opponent who may or may not impose a cost gives more weight to the influence of proprietary costs on disclosure. We study both the case in which proprietary costs can only be incurred in public markets and the case in which these costs can be incurred in both types of capital markets. We show that in the former case a segmentation of the capital market can only occur when public capital is cheaper than private capital, otherwise all firms prefer private financing. In the latter case capital market segmentation may occur whatever the nature of the capital cost differential. Finally we show that the point in time on which the issuing firm is asymmetrically informed strongly influences the financing decision can be interpreted as a signal of the quality of the firm; if the firm is asymmetrically informed *after* the financing decision, it cannot.

The last extension discussed in this chapter concerns the introduction of an additional source of private information. With only one source of private information the financing and disclosure decision are strongly in line with each other. With two different sources that are manifested at different points in time, both corporate decisions can more separately inform outsiders on the quality of the firm. We assume that the firm is asymmetrically informed about its growth opportunities before it has to decide on its financing choice and that this private information cannot be disclosed credibly. Verifiable information on the firm's growth opportunities is revealed to the firm after it has made the financing decision. Contrary to the first type of private information, this information can be disclosed credibly. The disclosure of this second type of private information depends on the firm's disclosure environment. In this chapter we consider only two different environments: the private capital market in which the firm can withhold its information from the opponent and the public capital market in which it has to disclose this information. In the next chapter we will elaborate on this latter model by introducing a richer set of firm types and by introducing the possibility to voluntarily disclose the private information for both publicly and privately financed firms to further separate the financing and the disclosure decision. More specifically, we will implement Wagenhofer's (1990) disclosure model in our financing model.

# Appendix 3.A: The introduction of an agency cost related to public financing in the model presented in Section 3.5

It seems reasonable that firms that face high proprietary costs have an incentive to finance privately in order to prevent leaking proprietary information. However, one might question the inference that it is the worst firms that are active on the IPO market. Of course, firms that are characterized as worse in our setting are relatively worse in the sense that they have the lowest payment probability of the set of firms that may go public. Firms are usually only allowed to go public if they can show a profitable history. For example, one of the requirements for listing at the Amsterdam Exchanges Stock Exchange is a history of at least three profitable annual accounts in the last five years. Our basic model can explain the existence of such requirements, because public markets attract the worst firms. Hence, the worst firm of our set may still have positive earnings expectations. Still, those firms are not the best ones and for that reason they may be better off with, or more easily accepted by, private investors. This is because one or a few investors can more easily manage their investments in case of future insolvency by interfering directly with the investment activities of the insolvent firm. Public investors usually do not have this opportunity because they are usually with too many, which causes a free-rider problem.

Agency considerations like the one introduced by Myers (1977) can also be used as a rationale for the argument introduced in this appendix. It is clear that a few private investors can more easily exercise the growth options that are left by a defaulting firm than public investors can. For this reason, collateral will be more easily (or only) granted to private investors. Therefore, we will introduce an agency cost associated with public financing that is higher as the quality of the issuer is lower. As a result, there is an additional force that may drive issuers to the private market.

Based on the case described in Section 3.5 and the amendment discussed in this appendix the following price functions for public and private capital can be defined. When risk preferences are neglected, all investors demand at least a rate of return r that can be made by holding the (traded) riskless security. We assume that such a security exists. Let it be a riskless government bond. In case of private capital this opportunity cost is increased by an illiquidity cost l, stemming from the lower flexibility in trading private securities. Thus, the cost to the issuer of using private capital is

$$\frac{\pi_i D}{P(\pi_i)} = (1+r)(1+l) \, .$$

Rearranging terms yields

$$P(\pi_i) = \frac{\pi_i D}{(1+r)(1+l)}.$$

The cost of using public capital consists of the following components. Public issues of capital raise issuing costs, such as audit and exchange fees and direct disclosure costs stemming from the dissemination of information. These costs are assumed to be a fixed proportion q of the dividend. In addition to this direct cost, there is an indirect cost of public financing caused by the proprietary nature of the private information. This proprietary cost p is assumed to be related to the payment probability of the firm  $\pi_i$ , so that the higher the payment probability, the higher the proprietary cost. The final component of the cost of public capital is the result of the agency problems that are assumed to be more severe with public than with private investors. We assume a negative relation between this agency cost and the payment probability. The lower the chance of insolvency, i.e. the higher the payment probability, the lower the expected cost stemming from a possible conflict of interest between the entrepreneur and the shareholders. Based upon these assumptions, the price for a public share equals

$$\frac{\pi_i D(1-q)(1-p\pi_i) \left(1-\frac{f}{\pi_i}\right)}{P(\pi_i)} = 1 + r$$

or

$$P(\pi_i) = \frac{\pi_i D(1-q)(1-p\pi_i) \left(1-\frac{f}{\pi_i}\right)}{1+r}$$

Issuers that have access to both sources of capital will choose the cheapest alternative. Depending on the values for the parameters in the equations, a segmentation may emerge similar to the one illustrated in Figure 3.2, where the lowest- and the highest-quality issuers finance privately and the others go public.

# **Chapter 4**

# Going Public and the Influence of Disclosure Environments<sup>1</sup>

# 4.1 Introduction

Information asymmetries hamper capital markets in allocating capital across the most productive investment opportunities. Firms in demand for capital need to inform potential capital market investors of the prospects of their investment opportunities, but in doing so they may simultaneously inform third parties with countervailing interests. The latter includes informing potential opponents like product market competitors, which may result in the opponent taking some adverse actions that harm the firm. Particularly firms that consider an initial public offering (IPO) are faced with this confidential or proprietary information problem.<sup>2</sup> Instead of a public placement, the firm can choose to issue privately (to a bank or venture capitalist for example) which allows it to inform investors directly, thus reducing the chance of leaking proprietary information to third parties.<sup>3</sup> The extent to which private capital markets may mitigate proprietary information problems will typically depend on differences in disclosure requirements and monitoring, i.e. the disclosure environment, between both capital market types. In this chapter we will link the disclosure problem of leaking proprietary information with the capital market choice.

We argue that going public has a large impact on the incidence of leaking confidential or proprietary information for several reasons. First, a firm that goes public has to deal with unknown investors who it can primarily reach via public disclosures. Second, exchange authorities make high demands upon public disclosures. They normally impose additional

<sup>&</sup>lt;sup>1</sup> This chapter is an almost literal reproduction of a working paper by Marra and Suijs (2000).

<sup>&</sup>lt;sup>2</sup> The focus is on initial public offering firms, for these firms will experience the largest change in their disclosure environment. Firms considering a seasoned public offering may also consider proprietary information problems since each public offering itself usually comes with additional disclosure requirements (see Chapter 5 for an elaboration on this point). Furthermore, the mere offering of equity (or debt) capital creates a very direct interest between the firm and investors that may change the firm's disclosure behavior. See for example Healy et al. (1999) who documented earnings management behavior before public offerings. Firms considering a seasoned equity offering, however, have already experienced the conversion to a more demanding disclosure environment and may already have adapted to the longer term public disclosure requirements. For this reason we focus solely on IPOs.

<sup>&</sup>lt;sup>3</sup> The idea that private (bank) financing may be driven by the desire for confidentiality was first pointed out by Campbell (1979).

disclosure rules and watch more closely over the timeliness, completeness and precision of corporate disclosures. Third, public firms will attract more attention from financial analysts and the press, which further increases public scrutiny. Finally, being caught for fraudulent disclosure in public has far more serious consequences. Litigation and reputation costs, for instance, are likely to be higher because more investors will be harmed and the negative news will be disseminated more broadly. Summarizing, public firms will face more pressure on their disclosure activities and will have less flexibility in choosing their disclosure channels. As a result, disclosure costs stemming from the leakage of proprietary information, henceforth referred to as proprietary disclosure costs, are expected to be higher for public firms and are therefore likely to affect a firm's going-public decision.

The foundation of this chapter has been laid in the previous chapter. In a sequence of models we have derived at a setting in which the capital market choice has been defined as the tradeoff of a capital cost differential and a disclosure cost differential. The capital cost differential is defined as a fixed difference in the cost of public and private capital apart from proprietary disclosure costs. The proprietary disclosure cost differential is defined as the difference in the likelihood that an opponent will take an adverse action. In this chapter we want to elaborate further on the development of a model on capital market choice, primarily by introducing the opportunity to disclose voluntarily in public. More specifically, we incorporate Wagenhofer's (1990) disclosure model into our analysis.

Central in our model are private firms that meet the requirements for listing and that are faced with an (positive net present value) investment opportunity. We assume that the internal financing means fall short or that the investment outlay is simply too high so that the firm has to look for outside financing opportunities. The firm can choose to finance its business on the private or on the public capital market, each having their own cost of capital and disclosure regime. With respect to the cost of capital, we consider two scenarios: public capital may be cheaper or more costly than private capital. The first scenario is believed to be the most general one. However, incentive and other than proprietary information problems can be so high – particularly in case of young and relatively unknown firms – that it can make public capital more expensive than private capital. The two capital cost scenarios are studied under two different disclosure regimes. First, we consider the case in which firms *must* disclose their proprietary information when they go public; second, we consider the case in which firms can disclose this information voluntarily. In both disclosure settings it is assumed that private

firms cannot *publicly* disclose their proprietary information in a credible way;<sup>4</sup> an assumption that is relaxed later on in the analysis.

The appropriate disclosure environment depends on the extant disclosure rules of a particular exchange applying to the informational item that is considered to be proprietary in nature. For example, if the proprietary information can be thought of as the firm's earnings figure,<sup>5</sup> a public firm in almost all developed countries is obliged to disclose it, whereas in most jurisdictions – most notably that of the US – a private firm can withhold it. In EU-countries, where disclosure rules are predominantly code instead of listing based, differences in formal reporting requirements between public and potential public firms are smaller than in the US. One thus might conclude that our model is less appropriate in these instances. A firm's disclosure environment, however, is not solely determined by formal reporting rules. The changes of being caught for breaking the rules (which depend on factors like the extent of monitoring by capital market authorities and the development of the financial analysts industry) as well as the penalties on breaking the rules are also important. It is clear that the demand for public disclosures and the extent of monitoring are higher for public than for private firms (see Chapter 5 for an elaboration on this point).

The basic model that we present includes four risk-neutral decision-makers: a privately informed firm, the public and private capital market, and an opponent.<sup>6</sup> At some stage of the game, the firm receives private information about its firm value, e.g. earnings. Private information ranges from relatively bad to relatively good with the interpretation that better private information results in a higher firm value. The kind of private information that a firm receives, depends on its type. Types can be ordered from good to bad on the basis of first order stochastic dominance, i.e. a better type receives valuable private information with higher probability. The game is then played as follows. Dependent on its type, the firm decides between public and private financing. Since we consider the financing decision to be the more fundamental decision with more long-term consequences relative to the disclosure decision, the financing decision is made before the firm receives its private information in

<sup>&</sup>lt;sup>4</sup> For example, because private markets lack disclosure standards that can be warranted by auditors (cf. Melnik & Plaut, 1994 (see also Section 3.3, footnote 9)) or because private placements are usually not warranted by an investment banker.

<sup>&</sup>lt;sup>5</sup> Other generally used examples of proprietary information are earnings expectations and segmented information, although a large array of corporate information has the potential of being proprietary in nature.

more detail. Once the financing decision is made, the firm learns its private information about firm value that it discloses in the appropriate way. Subsequently, the capital markets and the competitor observe the firm's financing and disclosure decision and update their beliefs about firm value accordingly. Dependent on these beliefs, the competitor can decide to take an adverse action that imposes proprietary costs on the firm. It is assumed that the competitor benefits from taking the adverse action if and only if it believes that firm value exceeds a certain threshold value (cf. Wagenhofer, 1990). The goal of the firm is to maximize the resulting firm value, as perceived by its investors, including the cost of capital and the proprietary cost due to any adverse action by the competitor.

The second model introduces disclosure flexibility for the public firm in that disclosure of the private information is not longer mandated. This setting is applicable when the item that contains proprietary information is not subject to mandatory disclosure. Such a disclosure environment need not imply that the firm remains silent about its private information. Verrecchia (1983) and Wagenhofer (1990) show that firms may have an incentive to reveal their proprietary information. By introducing a voluntary disclosure environment for public financing the disclosure decision gets more separated from the financing decision. The possibility of withholding the proprietary information is no longer directly attached to the choice of financing.

We show that in these settings several sequential equilibria may arise. The two extreme cases are a full private financing equilibrium and a full public financing equilibrium, in which all types choose private and public financing, respectively. In the intermediate case of a partial financing equilibrium, both privately and publicly financed types occur. The existence of either equilibrium depends mainly on the relative difference between the (proprietary) disclosure cost and the capital cost. Furthermore, in a partial financing equilibrium only the relatively better types opt for private financing. The latter result can be explained as follows. Suppose that the cost of private capital exceeds the cost of public capital. Then we can show that in equilibrium the competitor refrains from taking the adverse action when observing private financing, implying that a privately financed firm incurs no proprietary cost. Since private capital is relatively costly, private financing is beneficial only for those firms that will most likely incur proprietary costs under the mandatory public disclosure rule of public finan-

<sup>&</sup>lt;sup>6</sup> For ease of notation we restrict ourselves to one opponent. The results presented in this chapter still hold true

cing, i.e. the relatively good types. Similar reasoning holds when the cost of public capital exceeds the cost of private capital. Then we can show that in equilibrium the competitor will take its adverse action when observing private financing. Since public capital is relatively costly, public financing is beneficial only for those firms that will most likely avoid incurring proprietary costs in case of public financing, i.e. the relatively bad types. Hence, the relatively good types finance privately. Furthermore, the result that the relatively good firms prefer private financing in a partial financing equilibrium turns out to be robust to changes in the disclosure environments.

#### 4.2 Related literature

One of the first papers that explicitly examines the question why firms go public is by Pagano (1993). Pagano considers the going-public decision as a trade-off between portfolio diversification benefits and listing costs. In his model the propensity of a firm to go public within a particular economy depends on the going-public decision of other firms. The more firms are willing to bear the private listing costs, the more efficient the general diversification opportunities can be. This externality, however, can create several equilibria, one of them featuring a stock market with very few companies listed. Zingales (1995) focuses solely on corporate control aspects associated with going public. In his model going public is the result of a value maximizing decision made by an initial owner who wants to sell his company. By first going public the initial owner can increase his gains from eventually selling the whole company to a large shareholder.<sup>7</sup> Pagano and Röell (1998) also consider monitoring as an important consideration on the side of an initial owner in deciding how to offer equity. To balance the benefits stemming from the firm's market value and future private benefits, the initial owner weighs the cost of (over)monitoring<sup>8</sup> against the cost of providing a liquid market. The optimal solution contains some level of monitoring and some measure of dispersion. An interesting prediction of the model is that more stringent disclosure environments increase incentives to

though, if we allow for more than one opponent (see Section 4.4.3).

<sup>&</sup>lt;sup>7</sup> Other papers that consider an IPO as part of an overall value maximizing strategy of selling a firm are Mello and Parsons (1998) and Stoughton and Zechner (1998).

<sup>&</sup>lt;sup>8</sup> In the paper the term overmonitoring is used from the perspective of the initial owner of the firm. Assuming that he wants to keep control over the firm, the initial owner will also be interested in future private benefits when selling part of the firm. In this case the optimal level of monitoring from the perspective of other investors, i.e. the level of monitoring that maximizes the market value of the firm, need not coincide with the level of monitoring that maximizes the utility of the initial owner.

go public, because it offers more efficient monitoring. We show that the opposite may be true if proprietary disclosure costs are involved.

In Chemmanur and Fulghieri (1999) the going-public decision involves trading off the bargaining power of private investors against information production costs. Large shareholders have more bargaining power which enhances the possibility of enforcing a higher return on their investments to compensate the idiosyncratic risk run on the relatively large shareholdings. By publicly selling equity to numerous small well-diversified investors, the firm can mitigate the bargaining problem. Information production costs born by the issuer are higher in case of public placements though. In the model firms go public only if a sufficient amount of information about them has accumulated in the public domain.

More related to our study are Maksimovic and Pichler (1998b), and Yosha (1995). Instead of concentrating on control issues, Maksimovic and Pichler focus on the influence of leaking confidential information to product market competitors on the decision to go public or stay private. They too model the choice of outside financing as a trade-off between a difference in cost of capital and indirect information disclosure costs. Their focus, however, is more on the timing of the going-public decision than on the decision itself. All firms in their analysis go public eventually. Early investing firms in an emerging or changing industry trade-off the higher cost of private capital against the higher likelihood of prematurely informing potential entrants by going public at an early stage. In contrast to the present study, they do not explicitly model the disclosure opportunities available to public and private issuers (i.e. they do not consider opportunities of strategic disclosure).

Yosha (1995) analyzes the effect of information disclosure costs on the decision between bilateral and multilateral financing, which can be related to private and public financing, respectively. Besides utilizing the somewhat uncommon view of public capital being more costly than private capital,<sup>9</sup> the effect of proprietary costs on firm value is rather limited in this model. This becomes particularly clear if one abandons Yosha's view and supposes that

<sup>&</sup>lt;sup>9</sup> His explanation for this is that a bilateral financing arrangement involves communication with fewer agents than a multilateral financing arrangement. Therefore, private capital should be less costly. Yosha (1995) disregards other factors that are generally believed to be of more importance in distinguishing public from private capital, like liquidity and diversification arguments. We refer to Maksimovic and Pichler (1998a) for a general explanation of the relatively lower cost of public capital. In this thesis we distinguish between the cost of capital

private capital is relatively costly compared to public capital. For in that case, the effect of proprietary costs on firm value is negligible and all firms prefer public to private financing.

# 4.3 The model

Let us start with providing a mathematical description of the model. First, all parties participating in the game, i.e. the firm, the opponent, and the private and public capital market, are assumed to be risk-neutral and rational decision makers. At some stage of the game the firm will receive private information about its firm value that is proprietary in nature. This private information will be denoted by  $y \in \mathbb{R}$  and belongs to the interval  $Y = [\underline{y}, \overline{y}]$ . Examples of what this private information can represent are profit figures, turnover, R&D expenses, production costs, or product quality. In fact, it can be given any meaning, as long as it can be represented by a one-dimensional compact interval. So, what the private information cannot contain is information about both quality *and* costs.

The private information y determines firm value  $v(y) \in \mathbb{R}_+$ . We assume that v(y) is strictly increasing and continuous in y. Hence, we can interpret  $\underline{y}$  as relatively bad and  $\overline{y}$  as relatively good information. Furthermore, since v is assumed to be strictly increasing, we may assume without loss of generality that v(y) = y for all  $y \in Y$ .<sup>10</sup> Since we assumed the firm to be risk-neutral, the firms objective of maximizing expected firm value is equivalent to maximizing the expected change in firm value, which, in fact, can be represented by the change in share price. Hence, we can also state the firm's objective as maximizing the expected change in share price.

The kind of private information that a firm can receive, depends on its type  $\theta$ . Given a firm of type  $\theta$ , also referred to as firm  $\theta$ , the private information that it receives is determined by a random variable  $\tilde{y}_{\theta}$  with probability distribution function  $F(y,\theta)$  and density function  $f(y,\theta)$ . A firm's type may be interpreted as a measure of the firm's potential performance or

and the cost of financing, where the latter may differ from the former due to proprietary disclosure costs (see also footnote 1 of Chapter 1).

<sup>&</sup>lt;sup>10</sup> For if  $v(y) \neq y$  for some  $y \in Y$  we can consider the information set  $Y' = \{v(y) | y \in Y\}$ . Since v is strictly increasing and continuous, Y' is compact and there is a one-to-one correspondence between Y and Y'. By defining v'(y) = y for all  $y \in Y'$  we obtain the desired result.

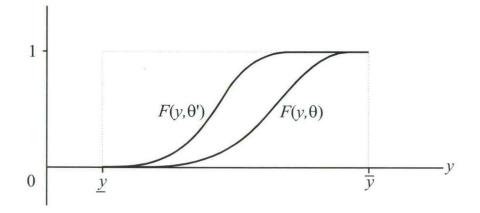


Figure 4.1: Stochastic dominance of firm's types  $\dot{e}, \dot{e}' \in \dot{E}$  with  $\dot{e} > \dot{e}'$ 

long-term profitability, for it describes, albeit indirectly, the probability distribution of the firm's future value. Note that there are many factors that determine a firm's potential performance. Some of these factors like the product market in which it operates or the state of the economy are publicly observable. Many other factors, however, like technology used, capacity, know how, and experience, are not. Since there is no direct, verifiable evidence of how much each of these factors contribute to the firm's potential performance, we assume that it is impossible for a firm to make a credible revelation of its type to either the capital markets, the opponent, or both. If the firm wants to communicate any information about its type, it can only do so by strategically making its publicly observable financing and disclosure decision.

The type space  $\Theta \subset \mathbb{R}$  equals  $[\underline{\theta}, \overline{\theta}]$  by assumption. A firm's type is determined by a random variable  $\widetilde{\theta}$  with probability distribution function G and density function g. We assume that F, f, G, and g are common knowledge, that  $G(\theta)$  is continuous in  $\theta$ , and that  $F(y,\theta)$  is continuous in y and decreasing in  $\theta$ . The latter assumption implies that  $F(y,\theta) \leq F(y,\theta')$  for all  $y \in Y$  if  $\theta > \theta'$ , so that  $\widetilde{y}_{\theta}$  stochastically dominates  $\widetilde{y}_{\theta'}$  (see also Figure 4.1). Consequently, we can order firm types on the basis of first order stochastic dominance from the relatively bad type  $\underline{\theta}$  to the relatively good type  $\overline{\theta}$ .

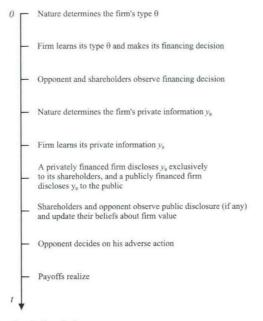


Figure 4.2: Time schedule of the game

A description of the order in which the game is played is depicted in Figure 4.2. First, nature determines the firm's type. Subsequently, the firm makes its financing decision while taking into account that each type of financing comes with its own particular cost and disclosure environment. Private capital comes with a cost  $C_b \ge 0$ . Furthermore, a privately financed firm can disclose its private information exclusively to its investor(s), but cannot make a credible public disclosure. Public capital, on the other hand, comes with a cost  $C_m \ge 0$  and a mandatory public disclosure of its private information. Since we focus on the relation between the choice of financing and the disclosure environment, we assume that the firm can always acquire the necessary capital on the market that it desires. Once the firm has made its financing decision, the firm receives private information about its firm value and discloses this information in the appropriate way. We assume that due to some antifraud rule the firm is not able to misrepresent its information so that any public disclosure is truthful. Subsequently, the opponent and the shareholders update their beliefs about firm value and the opponent makes a decision regarding his adverse action. For modeling the opponent's behavior we take the same approach as Wagenhofer (1990). This means that it is beneficial for the opponent to take the

adverse action, and thereby impose proprietary cost  $C_p > 0$  on the firm, if and only if he believes that the expected firm value exceeds a certain threshold value  $K \in Y$ .

Since the disclosure environment completely determines a firm's disclosure decision, the only decision that remains to the firm is the financing decision. A financing strategy is described by a pair  $(\Theta_b, \Theta_m)$  with the interpretation that a firm of type  $\theta \in \Theta_b$  chooses for private financing while a firm of type  $\theta \in \Theta_m$  chooses for public financing. Note that in the forth-coming analysis we confine ourselves to pure financing strategies only, so that randomization between private and public financing is excluded.

In our model, we abstract from any agency problems, and assume that the manager of the firm strives to obtain the goal of its investor(s), which is to maximize expected firm value including the cost of capital and possibly the proprietary cost. With regard to the latter cost, recall that the opponent takes the adverse action, if his beliefs regarding the expected firm value exceed a certain threshold value  $K \in Y$ . Thus, we can model the opponent's action by

$$a(\beta) = \begin{cases} 1 & \text{if } \beta \ge K, \\ 0 & \text{if } \beta < K, \end{cases}$$
(4.1)

where  $\beta \in Y$  denotes the opponent's beliefs about expected firm value. Note that since a publicly financed firm  $\theta$  makes a mandatory public disclosure of its private information  $y_{\theta}$ , the opponent learns the firm's private information  $y_{\theta}$ . Hence, we only need to specify the opponent's beliefs if he observes private financing.

Let  $\beta_b(\Theta_b, \Theta_m)$  denote the opponent's beliefs about the expected firm value of a privately financed firm when the financing strategy is  $(\Theta_b, \Theta_m)$ . Recall that the probability distribution functions F and G of  $\tilde{y}_{\theta}$  and  $\tilde{\theta}$ , respectively, are common knowledge. Thus, the opponent's prior beliefs about expected firm value equal  $E(\tilde{y}_{\tilde{\theta}})$ . Next, suppose that private financing occurs with strictly positive probability, that is  $Pr(\tilde{\theta} \in \Theta_b) > 0$ , then we can update the opponent's prior beliefs as follows. Given that only firms  $\theta \in \Theta_b$  are privately financed, his beliefs concerning the expected firm value conditional upon observing private financing equal

 $E(\tilde{y}_{\tilde{\theta}}|\tilde{\theta} \in \Theta_b)$ . If private financing occurs with zero probability, that is  $Pr(\tilde{\theta} \in \Theta_b) = 0$ , then the conditional expectation does not exist. In this case, the beliefs about expected firm value upon observing private financing may be any firm value  $y_b \in Y$ . The beliefs  $y_b$  may be considered as the so-called out-of-equilibrium beliefs.

Summarizing, the beliefs of the opponent upon observing private financing equal

$$\beta_{b}(\Theta_{b},\Theta_{m}) = \begin{cases} E(\widetilde{y}_{\tilde{\theta}} | \widetilde{\theta} \in \Theta_{b}), & if Pr(\widetilde{\theta} \in \Theta_{b}) > 0, \\ y_{b}, & if Pr(\widetilde{\theta} \in \Theta_{b}) = 0, \end{cases}$$
(4.2)

where  $y_b \in Y$ .

Now, we can determine the expected payoff of the firm. Since a privately financed firm of type  $\theta$  can disclose its private information exclusively to its investors, firm value equals  $y_{\theta}$  minus the cost  $C_b$  of private capital and, in case the opponent takes the adverse action, minus the proprietary cost  $C_p$ . The expected payoff of private financing thus equals

$$V_{b}(\theta, (\Theta_{b}, \Theta_{m})) = E(\widetilde{y}_{\theta} - C_{b} - C_{p}a(\beta_{b}(\Theta_{b}, \Theta_{m})))$$
  
$$= E(\widetilde{y}_{\theta}) - C_{b} - C_{p}a(\beta_{b}(\Theta_{b}, \Theta_{m})).$$
(4.3)

Note that the beliefs of the opponent only affect a privately financed firm's payoff through the proprietary cost.

Since a publicly financed firm of type  $\theta$  makes a mandatory, truthful public disclosure of its private information  $y_{\theta}$ , the opponent's beliefs about the firm's private information equal  $y_{\theta}$ . The expected payoff of public financing thus equals

$$V_{m}(\theta, (\Theta_{b}, \Theta_{m})) = E(\widetilde{y}_{\theta} - C_{m} - C_{p}a(\widetilde{y}_{\theta}))$$
  
$$= E(\widetilde{y}_{\theta}) - C_{m} - Pr(\widetilde{y}_{\theta} \ge K)C_{p}$$
  
$$= E(\widetilde{y}_{\theta}) - C_{m} - (1 - F(K, \theta))C_{p}.$$
(4.4)

A sequential equilibrium (cf. Kreps and Wilson, 1982) consists of a financing strategy  $(\Theta_b^*, \Theta_m^*)$  and beliefs  $\beta_b(\Theta_b^*, \Theta_m^*)$  concerning the expected firm value upon observing private financing, such that

- (a) private financing is the optimal choice for each firm  $\theta \in \Theta_b^*$  with respect to the beliefs  $\beta_b(\Theta_b^*, \Theta_m^*)$ , that is  $V_b(\theta, (\Theta_b^*, \Theta_m^*)) \ge V_m(\theta, (\Theta_b^*, \Theta_m^*))$  for all  $\theta \in \Theta_b^*$ ,
- (b) public financing is the optimal choice for each firm  $\theta \in \Theta_m^*$  with respect to the beliefs

$$\beta_b(\Theta_b^*,\Theta_m^*)$$
, that is  $V_m(\theta,(\Theta_b^*,\Theta_m^*)) \ge V_b(\theta,(\Theta_b^*,\Theta_m^*))$  for all  $\theta \in \Theta_m^*$ ,

(c) the beliefs  $\beta_b(\Theta_b^*, \Theta_m^*)$  are as defined in (2).

Condition (c) states that the beliefs  $\beta_b(\Theta_b^*, \Theta_m^*)$  are sequentially rational with respect to the financing strategy  $(\Theta_b^*, \Theta_m^*)$ . We will not go into the formal details of sequentially rational beliefs. For this, the interested reader is referred to Kreps and Wilson (1982). If for some type the firm is indifferent between public and private financing, it may arbitrarily choose one of them. Since we consider a continuum of types, the choice of the indifferent type is irrelevant.

We call a sequential equilibrium a full private financing equilibrium if  $Pr(\tilde{\theta} \in \Theta_b) = 1$  and a full public financing equilibrium if  $Pr(\tilde{\theta} \in \Theta_m) = 1$ . If in equilibrium both  $Pr(\tilde{\theta} \in \Theta_b) > 0$  and  $Pr(\tilde{\theta} \in \Theta_m) > 0$ , then we speak of a partial financing equilibrium. The following theorem concerns the existence of full private and full public financing equilibria. The proof of this and all forthcoming theorems are provided in Marra and Suijs (2000).

**Theorem 2.1** A full public financing equilibrium exists if and only if  $C_p F(K, \overline{\theta}) \ge C_m - C_b$ . A full private financing equilibrium exists if and only if

(a) 
$$E(\widetilde{y}_{\tilde{\theta}}|\tilde{\theta} \in \Theta) < K \text{ and } C_p(1-F(K,\underline{\theta})) \geq C_b - C_m, \text{ or}$$

(b) 
$$C_p F(K, \underline{\theta}) \leq C_m - C_b$$
.

A full public financing equilibrium arises from skeptical beliefs of the opponent, which imply that the opponent takes the adverse action whenever he observes private financing. Skeptical beliefs, however, cannot always sustain a full public financing equilibrium. Reason for this is that a privately financed firm can exclusively disclose its private information to its shareholders. Consequently, the exact firm value as perceived by the opponent is not that important to the firm, it is only the action that results from these beliefs that counts. Then the worst that can happen from the firm's point of view is, that the opponent believes that the firm's private information is valuable enough to take the adverse action, for such beliefs result in proprietary costs for the firm. Thus, a full public financing equilibrium always exists if private capital is relatively costly, i.e.  $C_m < C_b$ . For in that case, the proprietary cost resulting from the opponent's skeptical beliefs make private financing even more costly, so that each type prefers public financing to private financing. A full public financing equilibrium, on the other hand, need not always exist if public capital is relatively costly, i.e.  $C_m > C_b$ . In that case, the publicly financed firm's expected advantage  $C_p F(K, \theta)$  of incurring no proprietary cost should exceed the publicly financed firm's disadvantage  $C_m - C_b$  in capital cost. Thus, a full public financing equilibrium only exists if the proprietary cost  $C_p$  is sufficiently large compared to the capital cost differential  $C_m - C_b$ , so that private financing becomes more costly than public financing for all possible firm types.

In a full private financing equilibrium, skeptical beliefs are absent. What is important are the opponent's prior beliefs  $E(\tilde{y}_{\tilde{\theta}})$  about the firm's private information. These prior beliefs and the value of K determine whether or not the firm incurs the proprietary cost in a full private financing equilibrium. If public capital is relatively costly, i.e.  $C_m > C_b$ , and the opponent's threshold value K is sufficiently large, i.e.  $K \ge E(\tilde{y}_{\tilde{\theta}})$ , then a privately financed firm can always avoid incurring the proprietary cost. Consequently, private financing is preferred to public financing by all types of firms. If public capital is still relatively costly, i.e.  $C_m > C_b$ , but the opponent's threshold value K is sufficiently small, i.e.  $K < E(\tilde{y}_{\tilde{\theta}})$ , then a privately financing equilibrium. Consequently, private financing is preferred to public firm cannot avoid incurring the proprietary cost in a full private financing equilibrium. Consequently, private financing is preferred to public financing by all types, only if the capital cost advantage  $C_m - C_b$  exceeds the proprietary cost disadvantage  $C_p F(K, \theta)$  related to private financing. Thus, a full private financing equilibrium exists if the proprietary cost is sufficiently small compared to the capital cost differential  $C_m - C_b$ . For in that case, the relatively low cost of private capital still outweighs the proprietary cost.

If private capital is relatively costly, i.e.  $C_b > C_m$ , and the opponent's threshold value K is sufficiently large, i.e.  $K \ge E(\tilde{y}_{\tilde{\theta}})$ , then a privately financed firm can again avoid the proprietary cost in a full private financing equilibrium. Private financing is then preferred to public financing if the proprietary cost advantage  $C_p(1-F(K,\theta))$  related to private financing exceeds the capital cost disadvantage  $C_b - C_m$ . Thus, a full private financing equilibrium exists if the proprietary cost is sufficiently large compared to the capital cost differential  $C_b - C_m$ . For in that case the lower cost of public capital does no longer outweigh the expected proprietary cost of public financing.

**Theorem 2.2** Let  $(\Theta_b^*, \Theta_m^*)$  be a partial financing equilibrium. Then the set of privately financed firms equals  $\Theta_b^* = [\theta_1^*, \overline{\theta}]$  where

$$C_{p}\left(1-F\left(K,\theta_{1}^{*}\right)\right)-C_{p}a\left(E\left(\widetilde{y}_{\widetilde{\theta}}\middle|\widetilde{\theta}\in\Theta_{b}^{*}\right)\right)=C_{b}-C_{m}.$$
(4.5)

Furthermore,

- (a) if public capital is relatively costly, i.e.  $C_m > C_b$ , then a partial financing equilibrium exists if and only if  $C_p F(K, \underline{\theta}) > C_m C_b > C_p F(K, \overline{\theta})$  and  $E(\widetilde{y}_{\overline{\theta}} | \widetilde{\theta} \in \Theta_b^*) \ge K$ ;
- (b) if private capital is relatively costly, i.e.  $C_m < C_b$ , then a partial financing equilibrium exists if and only if  $C_p(1 F(K, \underline{\theta})) < C_b C_m < C_p(1 F(K, \overline{\theta}))$  and  $E(\widetilde{\gamma}_{\widetilde{\theta}} | \widetilde{\theta} \in \Theta_b^*) < K$ .

A firm prefers private to public financing if, from a private financing point of view, the expected proprietary cost advantage  $C_p(1 - F(K,\theta)) - C_p a(E(\tilde{y}_{\theta}|\tilde{\theta} \in \Theta_b)))$  exceeds the cost of capital disadvantage  $C_b - C_m$ . Since the proprietary cost advantage increases with the firm's type and the cost of capital disadvantage does not, the relatively better firms prefer private financing to public financing in a partial financing equilibrium. Furthermore, if private capital is relatively costly, then a privately financed firm does not incur the proprietary cost, for otherwise it would have gone public. This means that firms prefer private financing to public financing. Since proprietary costs are more likely to be incurred by the better firms, the better firms choose private financing. Moreover, even though the opponent knows

that only the better firms finance privately, his threshold value K is that high that it does not pay to take the adverse action.

If public capital is relatively costly, then the opponent takes the adverse action when observing private financing. Hence, a firm cannot avoid the proprietary cost by choosing private financing. This means that private financing is preferred to public financing if the cost advantage of private capital outweighs the possibility of no proprietary cost in case of public financing. Since the better firms have relatively little chance of avoiding proprietary costs when publicly financed, they prefer the cheaper option of private capital.

If there is no cost difference between private and public capital, i.e.  $C_b = C_m$ , then only full financing equilibria exist. The explanation is straightforward. If there is no difference in the capital cost, then the financing decision is completely determined by the opponent's action when observing private financing. Suppose that the opponent does not take the adverse action so that a privately financed firm avoids proprietary costs. If this is the case, a full private financing equilibrium results because public financing yields proprietary costs with positive probability. Similarly, suppose that the opponent does take the adverse action when observing private financing, so that a privately financed firm incurs proprietary costs. Then a full public financing equilibrium results, because a publicly financed firm incurs no proprietary costs with positive probability.

Summarizing, in a partial financing equilibrium, the relatively better firms choose private financing, whatever type of capital is more costly. Furthermore, private financing is a means to avoid incurring proprietary costs only if private capital is more costly than public capital. Also note that in the absence of proprietary costs, i.e.  $C_p = 0$ , partial equilibria cease to exist. Depending on which of the two types of capital is least costly, either a full private or a full public financing equilibrium arises.

#### 4.4 Public financing in a voluntary disclosure environment

In this section we change the disclosure environment of a publicly financed firm. Instead of a mandatory public disclosure, a publicly financed firm may now decide by itself, whether or not to disclose its private information to the public. More specifically, we implement Wagen-

hofer's voluntary disclosure model in our model so as to introduce a less stringent disclosure environment for publicly financed firms. The more flexible disclosure environment should make public financing more attractive to the relatively good firms, for it offers publicly financed firms with additional possibilities to avoid the proprietary cost. A voluntary disclosure environment is applicable when the proprietary information is not subject to mandatory disclosure.

In this setting, a strategy of the firm comprises the financing decision and, in case of public financing, the disclosure decision. Hence, it is described by the tuple  $(\Theta_b, \Theta_m, \{N_\theta\}_{\theta \in \Theta_m})$ , where  $\Theta_b \subset \Theta$  represents the privately financed firms,  $\Theta_m \subset \Theta$  the publicly financed firms, and  $N_\theta$  describes the nondisclosure set for each publicly financed firm  $\theta \in \Theta_m$ . The latter means that firm  $\theta \in \Theta_m$  discloses its private information  $y_\theta$  if and only if  $y_\theta \notin N_\theta$ . We maintain the assumption that a public disclosure is truthful and completely reveals the firm's private information.

Since the disclosure environment of a privately financed firm has not changed, the expected firm value for a privately financed firm  $\theta \in \Theta_h$  equals equation (4.3), i.e.

$$V_{b}(\theta, (\Theta_{b}, \Theta_{m}, \{N_{\theta}\}_{\theta \in \Theta_{-}})) = E(\widetilde{y}_{\theta}) - C_{b} - C_{p}a(\beta_{b}(\Theta_{b}, \Theta_{m}, \{N_{\theta}\}_{\theta \in \Theta_{-}})),$$

where

$$\beta_{b}(\Theta_{b},\Theta_{m},\{N_{\theta}\}_{\theta\in\Theta_{m}}) = \begin{cases} E(\widetilde{y}_{\widetilde{\theta}} | \widetilde{\theta} \in \Theta_{b}), & \text{if } Pr(\widetilde{\theta} \in \Theta_{b}) > 0, \\ y_{b}, & \text{if } Pr(\widetilde{\theta} \in \Theta_{b}) = 0. \end{cases}$$

are the opponent's beliefs about the expected firm value of a privately financed firm (cf. equation (4.2)).

In order to determine the expected firm value for a publicly financed firm, we first have to determine the opponent's and the public capital market's beliefs about firm value when they observe nondisclosure of a publicly financed firm. Similar to  $\beta_h$ , we distinguish two cases. If

nondisclosure by a publicly financed firm occurs with positive probability, i.e.  $Pr(\tilde{y}_{\tilde{\theta}} \in \bigcup_{\theta \in \Theta_m} N_{\theta} | \tilde{\theta} \in \Theta_m) > 0$ , then the updated beliefs about expected firm value equal  $E(\tilde{y}_{\tilde{\theta}} | \tilde{y}_{\tilde{\theta}} \in N_{\theta}, \tilde{\theta} \in \Theta_m)$ . If nondisclosure by a publicly financed firm occurs with zero probability, i.e.  $Pr(\tilde{y}_{\tilde{\theta}} \in \bigcup_{\tilde{\theta} \in \Theta_m} N_{\tilde{\theta}} | \tilde{\theta} \in \Theta_m) = 0$ , then the conditional expectation does not exist. In this case, the beliefs about expected firm value upon observing public financing may be any firm value  $y_m \in Y$ . Thus, we obtain that

$$\beta_{m}\left(\Theta_{b},\Theta_{m},\left\{N_{\theta}\right\}_{\theta\in\Theta_{m}}\right) = \begin{cases} E\left(\widetilde{y}_{\widetilde{\theta}} \mid \widetilde{y}_{\widetilde{\theta}} \in N_{\widetilde{\theta}}, \widetilde{\theta} \in \Theta_{m}\right), & \text{if } Pr\left(\widetilde{y}_{\widetilde{\theta}} \in \bigcup_{\theta\in\Theta_{m}} N_{\theta} \mid \widetilde{\theta} \in \Theta_{m}\right) > 0, \\ y_{m}, & \text{if } Pr\left(\widetilde{y}_{\widetilde{\theta}} \in \bigcup_{\theta\in\Theta_{m}} N_{\theta} \mid \widetilde{\theta} \in \Theta_{m}\right) = 0, \end{cases}$$
(4.6)

where  $y_m \in Y$ .

Since the goal of firm  $\theta$  is to maximize the expected firm value as perceived by its investors, firm value in case of public financing equals

$$\beta_{m} \big( \Theta_{b}, \Theta_{m}, \{ N_{\theta} \cdot \}_{\theta \in \Theta_{m}} \big) - C_{m} - C_{p} a \big( \beta_{m} \big( \Theta_{b}, \Theta_{m}, \{ N_{\theta} \cdot \}_{\theta \in \Theta_{m}} \big) \big)$$

if firm  $\theta$  withholds its private information  $y_{\theta}$  from the public, and it equals  $y_{\theta} - C_m - C_p a(y_{\theta})$  if firm  $\theta$  discloses  $y_{\theta}$ . The expected firm value then equals<sup>11</sup>

$$V_{m}\left(\theta, \left(\Theta_{b}, \Theta_{m}, \left\{N_{\theta}, \right\}_{\theta \in \Theta_{m}}\right)\right) = (1 - F(N_{\theta}, \theta)) \left(E\left(\tilde{y}_{\theta} | \tilde{y}_{\theta} \notin N_{\theta}\right) - C_{m} - C_{p} Pr\left(\tilde{y}_{\theta} \geq K | \tilde{y}_{\theta} \notin N_{\theta}\right)\right) + F\left(N_{\theta}, \theta\right) \left(\beta_{m}\left(\Theta_{b}, \Theta_{m}, \left\{N_{\theta}, \right\}_{\theta \in \Theta_{m}}\right) - C_{m} - C_{p} a\left(\beta_{m}\left(\Theta_{b}, \Theta_{m}, \left\{N_{\theta}, \right\}_{\theta \in \Theta_{m}}\right)\right)\right).$$

$$(4.7)$$

In a sequential equilibrium  $(\Theta_b^*, \Theta_m^*, \{N_\theta^*\}_{\theta \in \Theta_m^*})$ , the financing and disclosure decision of the firm is optimal with respect to the sequentially rational beliefs  $\beta_b (\Theta_b^*, \Theta_m^*, \{N_\theta^*\}_{\theta \in \Theta_m^*})$  and  $\beta_m (\Theta_b^*, \Theta_m^*, \{N_\theta^*\}_{\theta \in \Theta_m^*})$ .

<sup>&</sup>lt;sup>11</sup> For ease of notation we denote  $Pr(\tilde{y}_{\theta} \in N_{\theta})$  by  $F(N_{\theta}, \theta)$  in the remainder of this chapter.

Since sequential equilibria are subgame perfect, the (non)disclosure strategy  $N_{\theta}^*$  must be the optimal strategy with respect to the beliefs  $\beta_m (\Theta_b^*, \Theta_m^*, \{N_{\theta}^*\}_{\theta \in \Theta_m^*})$ . This subgame shows great resemblance to the voluntary disclosure model discussed in Wagenhofer (1990). In equilibrium, private information  $y_{\theta}$  is disclosed to the public if and only if disclosure results in a higher firm value than nondisclosure, that is

$$y_{\theta} - C_m - C_p a(y_{\theta}) \ge \beta_m \left(\Theta_b, \Theta_m, \{N_{\theta}\}_{\theta \in \Theta_m}\right) - C_m - C_p a(\beta_m \left(\Theta_b, \Theta_m, \{N_{\theta}\}_{\theta \in \Theta_m}\right)).$$

Hence, in a sequential equilibrium  $(\Theta_b^*, \Theta_m^*, \{N_\theta^*\}_{\theta \in \Theta_m^*})$  it holds for the nondisclosure set  $N_\theta^*$  that

$$N_{\theta}^{*} = \left\{ y \in Y \middle| \begin{array}{l} y - C_{m} - C_{p} a(y) \leq \\ E(\widetilde{y}_{\widetilde{\theta}} \middle| \widetilde{y}_{\widetilde{\theta}} \in N_{\widetilde{\theta}}^{*}, \widetilde{\theta} \in \Theta_{m}^{*}) - C_{m} - C_{p} a(E(\widetilde{y}_{\widetilde{\theta}} \middle| \widetilde{y}_{\widetilde{\theta}} \in N_{\widetilde{\theta}}^{*}, \widetilde{\theta} \in \Theta_{m}^{*})) \right\}$$
(4.8)

for all  $\theta \in \Theta_m^*$ .

We distinguish two types of disclosure equilibria. In a full disclosure equilibrium, a publicly financed firm  $\theta \in \Theta_m$  always discloses its private information. Thus,  $N_{\theta}^* = \emptyset$ . This equilibrium is supported by skeptical beliefs. When the opponent and the public capital market observe nondisclosure of a publicly financed firm, they believe the worst possible, i.e.  $y_m = \min\{y, K - C_p\}$ .

In a partial disclosure equilibrium, a publicly financed firm  $\theta$  withholds some of its private information from the public. The nondisclosure set  $N_{\theta}^*$  is characterized by two intervals, one containing relatively bad information and the other containing relatively good information (see Figure 4.3).<sup>12</sup> When the opponent observes nondisclosure, he cannot find out whether this is because the private information is good and the firm wants to avoid the proprietary cost, or just because the private information is bad. Since the latter thought always dominates in

<sup>&</sup>lt;sup>12</sup> Figure 4.3 illustrates one of the two general forms of partial disclosure equilibria. The alternative is characterized by  $d_2 = \overline{y}$  and implies only one disclosure interval.

equilibrium, the opponent refrains from taking the adverse action when he observes nondisclosure.

The next proposition makes a statement about how the equilibrium nondisclosure sets of publicly financed firms relate to each other.

**Proposition 3.1** Let  $(\Theta_b^*, \Theta_m^*, \{N_\theta^*\}_{\theta \in \Theta_m^*})$  be a sequential equilibrium with  $Pr(\widetilde{y}_{\widetilde{\theta}} \in \bigcup_{\theta \in \Theta_m^*} N_{\theta}^*|$  $\theta \in \Theta_m^*) > 0$ , and define  $N^* = [\underline{y}, d_1^*) \cup [K, d_2^*]$ , with  $d_1^* = E(\widetilde{y}_{\widetilde{\theta}} | \widetilde{y}_{\widetilde{\theta}} \in N_{\widetilde{\theta}}^*, \widetilde{\theta} \in \Theta_m^*)$  and  $d_2^* = \min\{\overline{y}, d_1^* + C_p\}$ . Then  $d_1^* < K$  and  $Pr(\widetilde{y}_{\theta} \in N_{\theta}^* - N^*) = 0$  for all  $\theta \in \Theta_m^*$ 

Proposition 3.1 states that all publicly financed firms essentially use the same disclosure strategy. The intuition behind this proposition is clear. Since the opponent cannot distinguish between the various types of firms that choose public financing, he cannot have skeptical beliefs for one type  $\theta \in \Theta_m^*$  and other beliefs for another type  $\theta' \in \Theta_m^*$ . As a result, either all publicly financed firms play a full disclosure strategy, or all publicly financed firms play the same partial disclosure strategy.

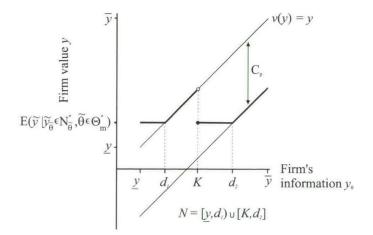


Figure 4.3: A partial disclosure equilibrium

Since full disclosure yields the same payoff as mandatory disclosure, Theorem 2.1 and Theorem 2.2 also apply if a full disclosure equilibrium occurs.

### Theorem 3.2

(a) A full public financing equilibrium that features a partial disclosure equilibrium exists if and only if there exists  $N^* = [y, d_1^*) \cup [K, d_2^*]$  such that

$$N^* = \left\{ y \in Y \middle| E\left( \widetilde{y}_{\widetilde{\theta}} \middle| \widetilde{y}_{\widetilde{\theta}} \in N^*, \widetilde{\theta} \in \Theta \right) - C_p a\left( E\left( \widetilde{y}_{\widetilde{\theta}} \middle| \widetilde{y}_{\widetilde{\theta}} \in N^*, \widetilde{\theta} \in \Theta \right) \right) \ge y - C_p a(y) \right\}$$
(4.9)

and

$$F(N^*,\overline{\theta})(d_1^* - E(\widetilde{y}_{\widetilde{\theta}} | \widetilde{y}_{\widetilde{\theta}} \in N^*)) + C_p a(E(\widetilde{y}_{\widetilde{\theta}} | \widetilde{\theta} \in \Theta_b^*)) - C_p (1 - F(d_2^*,\overline{\theta})) \ge C_m - C_b.$$

$$(4.10)$$

(b) A full private financing equilibrium exists if and only if

$$C_{p}(1-F(K,\underline{\theta}))-C_{p}a(E(\widetilde{y}_{\widetilde{\theta}}))\geq C_{b}-C_{m}.$$
(4.11)

(c) In a partial financing equilibrium with partial disclosure strategy  $N^* = [\underline{y}, d_1^*) \cup [K, d_2^*] \neq \emptyset$ , the set of privately financed firms equals  $\Theta_b^* = [\theta_2^*, \overline{\theta}]$ , where  $\theta_2^* \in \Theta$  is such that  $F(N^*, \theta_2^*)(d_1^* - E(\widetilde{y}_{\theta_2^*} | \widetilde{y}_{\theta_2^*} \in N^*)) + C_p a(E(\widetilde{y}_{\overline{\theta}} | \widetilde{\theta} \in \Theta_b^*)) - C_p (1 - F(d_2^*, \theta_2^*)) = C_m - C_b$ . Furthermore,  $\theta_2^* \ge \theta_1^*$ , and if private capital is relatively costly, i.e.  $C_b > C_m$ , then it holds that  $E(\widetilde{y}_{\overline{\theta}} \widetilde{\theta} \in \Theta_b^*) < K$ .

A full public financing equilibrium involves skeptical beliefs about privately financed firms. The advantage of public financing consists of two parts, the proprietary cost advantage  $C_p a(E(\tilde{y}_{\tilde{\theta}} | \tilde{\theta} \in \Theta_b^*)) - C_p (1 - F(d_2^*, \bar{\theta}))$  and the nondisclosure advantage  $F(N^*, \bar{\theta})(d_1^* - E(\tilde{y}_{\bar{\theta}} | \tilde{y}_{\bar{\theta}} \in N^*))$ . The latter advantage represents the misvaluation of the firm by the opponent and the public capital market when they observe nondisclosure. Note that if there is an undervaluation of the firm, there is actually a nondisclosure disadvantage for the publicly financed firm. Thus, in a full public financing equilibrium, the proprietary cost advantage and the nondisclosure advantage exceed the capital cost disadvantage  $C_m - C_b$  for all types.

Skeptical beliefs about firm value of a publicly financed firm is not necessary to sustain a full private financing equilibrium. If, however, such an equilibrium exists with other than skeptical beliefs, then also such an equilibrium exists with skeptical beliefs. In other words, if

skeptical beliefs cannot sustain a full private financing equilibrium, than no other sequentially rational beliefs can sustain such an equilibrium. Furthermore, if private capital is more costly than public capital, i.e.  $C_b > C_m$ , then expression (11) can only be satisfied if  $E(\tilde{y}_{\tilde{\theta}}) < K$ , which implies that the opponent refrains from taking the adverse action. So, although private capital is more expensive, the benefits from no proprietary cost is sufficiently high to make all firms prefer private financing to public financing.

In a partial financing equilibrium the relatively better firms still prefer private financing. In this regard, nothing has changed compared to a mandatory disclosure environment. In a voluntary disclosure environment though, public financing occurs more often than in a mandatory disclosure environment, because the opportunity to disclose voluntary reduces the expected proprietary disclosure cost. This finding reflects the value of disclosure flexibility that arises when the disclosure of proprietary information is not mandated.

# 4.5 Extensions and related issues

For both disclosure environments discussed thus far it holds that in a partial financing equilibrium the better firms prefer private financing. Moreover, it can happen that privately financed firms incur proprietary costs in a partial financing equilibrium. When this is the case, a privately financed firm might want to publicly disclose its private information when this information turns out to be relatively bad, for a disclosure of bad information keeps the opponent from taking the adverse action. Privately financed firms, however, are assumed not to be able to make credible public disclosures. Next, we examine how the results of Theorem 2.1 and Theorem 2.2 change if we allow for such public disclosures. It turns out that relaxing the disclosure rules in this way will not radically change the equilibria: the relatively better firms still prefer private financing to public financing.

# 4.5.1 Credible public disclosures by privately financed firms

Let us return to our basic model with mandatory public disclosures for publicly financed firms, and suppose that privately financed firms are able to make a credible public disclosure about their private information. The incentive to make such a disclosure arises when the opponent imposes the proprietary cost on privately financed firms. For if this is the case, a

privately financed firm with bad private information could still avoid proprietary costs by publicly disclosing this information. Since such a disclosure environment makes private financing more attractive, we should expect to see more firms choose private financing.

In such disclosure environments, a strategy is described by the tuple  $(\Theta_b, \{N_\theta\}_{\theta \in \Theta_b}, \Theta_m)$ , where  $\Theta_b \subset \Theta$  represents the set of privately financed firms,  $N_\theta \subset Y$  the disclosure strategy of a privately financed firm  $\theta \in \Theta_b$ , and  $\Theta_b \subset \Theta$  the set of publicly financed firms. Note that a privately financed firm  $\theta \in \Theta_b$  publicly discloses the information if and only if  $y \notin N_\theta$ , and that such a disclosure is truthful by assumption.

In order to determine the expected firm value for a privately financed firm, we first need to specify the beliefs of the opponent when observing nondisclosure. We distinguish two cases. If nondisclosure by a privately financed firm occurs with positive probability, i.e.  $Pr(\tilde{y}_{\tilde{\theta}} \in \bigcup_{\theta \in \Theta_b} N_{\theta} | \tilde{\theta} \in \Theta_b) > 0$ , then the updated beliefs concerning the expected firm value equal  $E(\tilde{y}_{\tilde{\theta}} | \tilde{y}_{\tilde{\theta}} \in N_{\tilde{\theta}}, \tilde{\theta} \in \Theta_b)$ . If nondisclosure occurs with zero probability, i.e.  $Pr(\tilde{y}_{\tilde{\theta}} \in \bigcup_{\theta \in \Theta_b} N_{\theta} | \tilde{\theta} \in \Theta_b) = 0$ , then the conditional expectation does not exist, so that the beliefs are allowed to be any value  $y_b \in Y$ . Hence, the beliefs  $\beta_b (\Theta_b, \{N_{\theta}\}_{\theta \in \Theta_b}, \Theta_m)$  of the opponent when observing nondisclosure by a privately financed firm with strategy  $(\Theta_b, \{N_{\theta}\}_{\theta \in \Theta_b}, \Theta_m)$  equal

$$\beta_{b}\left(\Theta_{b},\left\{N_{\theta}\right\}_{\theta\in\Theta_{b}},\Theta_{m}\right) = \begin{cases} E\left(\widetilde{y}_{\widetilde{\theta}} \mid \widetilde{y}_{\widetilde{\theta}} \in N_{\widetilde{\theta}}, \widetilde{\theta} \in \Theta_{b}\right), & \text{if } Pr\left(\widetilde{y}_{\widetilde{\theta}} \in \bigcup_{\theta\in\Theta_{b}} N_{\theta} \mid \widetilde{\theta} \in \Theta_{b}\right) > 0, \\ y_{b}, & \text{if } Pr\left(\widetilde{y}_{\widetilde{\theta}} \in \bigcup_{\theta\in\Theta_{b}} N_{\theta} \mid \widetilde{\theta} \in \Theta_{b}\right) = 0. \end{cases}$$
(4.12)

Since the opponent learns  $y_{\theta}$  if a privately financed firm makes a public disclosure, the expected firm value for private financing equals

$$V_{b}\left(\theta,\left(\Theta_{b},\left\{N_{\theta},\left\{N_{\theta},\left\{N_{\theta},\left\{\Theta_{b},\left\{\Theta$$

For a publicly financed firm  $\theta \in \Theta_m$ , the disclosure regulations are the same as in our basic model. Thus, the expected firm value  $V_m(\theta, (\Theta_b, \{N_{\theta'}\}_{\theta \in \Theta_b}, \Theta_m))$  equals equation (4.4), i.e.

$$V_m(\theta, (\Theta_b, \{N_{\theta}, \{N_{\theta}, \{N_{\theta}, \{\Theta_m\}_{\theta \in \Theta_b}, \Theta_m\})) = E(\widetilde{y}_{\theta}) - C_m - C_p(1 - F(K, \theta)).$$

In a sequential equilibrium  $(\Theta_b^*, \{N_\theta^*\}_{\theta \in \Theta_b^*}, \Theta_m^*)$ , the financing and disclosure decision are optimal with respect to the beliefs. Subgame perfection implies that the equilibrium disclosure strategy  $N_\theta^*$  is optimal against the beliefs  $\beta_b(\Theta_b^*, \{N_\theta^*\}_{\theta \in \Theta_b^*}, \Theta_m^*)$ . Since the opponent's beliefs only affect expected firm value of a privately financed firm through the proprietary cost  $C_p$ , the firm is indifferent between disclosure and nondisclosure for many kinds of private information. For instance, if the opponent's beliefs are such that a nondisclosing privately financed firm incurs no proprietary cost, this firm is indifferent between disclosing and nondisclosing any information y < K.

The next proposition makes a statement about the equilibrium disclosure strategy of privately financed firms.

**Proposition 4.1** Let  $(\Theta_b^*, \{N_\theta^*\}_{\theta \in \Theta_b^*}, \Theta_m^*)$  be a sequential equilibrium. Then for all  $\theta \in \Theta_b^*$  it holds that  $[K, \overline{y}] \subset N_\theta^*$  if  $\beta_b (\Theta_b^*, \{N_\theta^*\}_{\theta \in \Theta_b^*}, \Theta_m^*) < K$ , and  $N_\theta^* \subset [K, \overline{y}]$  if  $\beta_b (\Theta_b^*, \{N_\theta^*\}_{\theta \in \Theta_b^*}, \Theta_m^*) > K$ .

If in equilibrium the opponent does not take the adverse action when observing a nondisclosing privately financed firm, then a privately financed firm does not disclose relatively good information, i.e.  $y \ge K$ . Note that also some bad information should not be disclosed so as to keep the opponent from taking the adverse action. For if it would only conceal information  $y \ge K$ , then the opponent would know that the privately financed firm possesses relatively good information  $y \ge K$  when he observes nondisclosure. Consequently, he would impose the proprietary cost on the firm. So, a privately financed firm should be careful not to release so much bad information that it will change the opponents beliefs in such a way that he will take the adverse action when observing nondisclosure. If in equilibrium the opponent does take the adverse action when observing a nondisclosing privately financed firm, then a privately financed firm discloses all its relatively bad information, i.e. y < K. Note that in this case the firm is indifferent between disclosure and nondisclosure of good information, that is  $y \ge K$ . Furthermore, note that if bad information y < K is disclosed to the public, then the opponent's beliefs when observing nondisclosure always exceed the threshold value *K*. Hence, no inconsistency arises.

#### Theorem 4.2

- (a) A full public financing equilibrium exists if and only if private capital is more costly than public capital, i.e. C<sub>b</sub> ≥ C<sub>m</sub>.
- (b) If C<sub>m</sub> > C<sub>b</sub>, then a full private financing equilibrium always exists. If C<sub>b</sub> > C<sub>m</sub> then a full private financing equilibrium exists if and only if C<sub>p</sub>(1 − F(K, <u>θ</u>))≥ C<sub>b</sub> − C<sub>m</sub> and E(ỹ<sub>θ</sub> | ỹ<sub>θ</sub> ∈ N<sup>\*</sup><sub>θ</sub>) < K.</p>
- (c) If a partial financing equilibrium exists, then private capital is relatively costly, i.e. C<sub>b</sub> > C<sub>m</sub>, and the relatively good firms finance privately, i.e. Θ<sub>b</sub> = [θ<sub>3</sub><sup>\*</sup>, θ
  ], with θ<sub>3</sub><sup>\*</sup> such that C<sub>p</sub>(1 F(K, θ<sub>3</sub><sup>\*</sup>)) = C<sub>b</sub> C<sub>m</sub>. Furthermore, θ<sub>3</sub><sup>\*</sup> = θ<sub>1</sub><sup>\*</sup> (cf. Theorem 2.2), and the opponent refrains from taking the adverse action when observing nondisclosure by a privately financed firm, i.e. E(ỹ<sub>θ</sub>|ỹ<sub>θ</sub> ∈ N<sup>\*</sup><sub>θ</sub>, θ ∈ Θ<sup>\*</sup><sub>b</sub>) < K.</p>

A full public financing equilibrium is driven by skeptical beliefs, which means that the opponent takes the adverse action whenever he observes nondisclosure by a privately financed firm. The existence of a full private financing equilibrium when private capital is less costly than public capital is obvious. For in that case, private financing with full disclosure of information dominates public financing.

The opportunity to credibly disclose private information to the public, does not change the preferences of the firms between private and public financing. Compared to the situation where privately financed firms cannot make any credible public disclosures, exactly the same firms opt for private financing. The only difference is that partial financing equilibria can only exist when private capital is relatively costly. That a partial financing equilibrium does not exist in the opposite case, is due to the fact that a privately financed firm can choose to fully

disclose its private information to the opponent. By choosing this disclosure strategy, the firm mimics the behavior of a publicly financed firm. Thus, the difference between private and public financing is just the difference in the cost of capital. Since private capital is less costly than public capital, all types prefer private financing and a full private financing equilibrium arises.

# 4.5.2 Credible voluntary disclosures for private and public financing

In the second relaxation, we allow voluntary credible public disclosures by both publicly and privately financed firms. Hence, as in the former subsection, a private firm can make a credible public disclosure in addition to informing its private investors exclusively. A publicly financed firm is no longer compelled to reveal its private information publicly. So, we can describe a strategy by  $(\Theta_b, \Theta_m, \{N_\theta\}_{\theta \in \Theta})$ , where  $\Theta_b$  describes the privately financed firms,  $\Theta_m$  the publicly financed firms, and  $N_\theta$  the disclosure strategy of firm  $\theta \in \Theta$ .

For determining the expected payoff for both types of financing, recall that the beliefs of the opponent when he observes nondisclosure by a privately and a publicly financed firm, are given by the equations (4.12) and (4.6), respectively. Hence, the expected firm value for private and public financing equals the equations (4.13) and (4.7), respectively.

In a sequential equilibrium  $(\Theta_b^*, \Theta_m^*, \{N_\theta^*\}_{\theta\in\Theta})$ , the financing and disclosure decision are optimal with respect to the beliefs  $\beta_b(\Theta_b^*, \Theta_m^*, \{N_\theta^*\}_{\theta\in\Theta})$  and  $\beta_m(\Theta_b^*, \Theta_m^*, \{N_\theta^*\}_{\theta\in\Theta})$ . Subgame perfection implies that Proposition 3.1 and Proposition 4.1 hold true. Furthermore, if a full disclosure equilibrium arises for publicly financed firms, Theorem 3.2 also applies.

#### **Theorem 4.3**

- (a) A full public financing equilibrium featuring partial disclosure always exists if (9) holds and if public capital is relatively cheap compared to private capital, that is if  $C_m \leq C_b$ .
- (b) If C<sub>m</sub> > C<sub>b</sub>, then a full private financing equilibrium always exists. If C<sub>b</sub> > C<sub>m</sub> then a full private financing equilibrium exists if and only if C<sub>p</sub>(1−F(K,<u>θ</u>))≥C<sub>b</sub> − C<sub>m</sub> and E(y<sub>a</sub>|y<sub>a</sub> ∈ N<sup>\*</sup><sub>a</sub>) < K.</p>

Again, a full public financing equilibrium involves skeptical beliefs by the opponent when he observes nondisclosure by a privately financed firm. Skeptical beliefs by the opponent impose proprietary costs on the firm so that it wants to disclose all its bad information. Such a disclosure strategy, however, elicits the same behavior of the opponent as a full disclosure strategy for a publicly financed firm. And since public capital is relatively cheap, all firms prefer public financing to private financing. Note that in contrast with the previous models, a full public financing equilibrium may also exist if public capital is relatively costly. This equilibrium will only arises, of course, if the benefit from nondisclosure by publicly financed types is sufficiently large.

Since a full private financing equilibrium features skeptical beliefs, the optimal disclosure strategy of a publicly financed firm is full disclosure. Hence, the conditions for such an equilibrium are equivalent to that of Theorem 4.2.

If in a partial financing equilibrium privately financed firms can avoid the proprietary cost, then the possibility for privately financed firms to credibly disclose their information to the public does not make private financing more attractive. Compared to the environment that excludes such disclosures, the same type of firms prefer private to public financing. If, however, in a partial financing equilibrium the opponent imposes the proprietary costs on a nondisclosing privately financed firm, we cannot draw any conclusions but that public capital must be more costly than private capital.

#### 4.5.3 Multiple opponents

In modeling the opponent's behavior, we took the same approach as Wagenhofer (1990). This means that the motives behind the opponent's actions are not explicitly modeled. Instead, it is assumed that of all the decisions that the opponent may make to obtain his goal, only one

imposes a fixed proprietary cost on the firm. In addition, it is assumed that the opponent takes this decision if and only if he believes that firm value is sufficiently high. Agents that may act as an opponent include for instance product market competitors and governmental authorities. The present model, however, only takes into account one opponent. The results of our study remain valid though, if we allow for more than one opponent. In the case of *n* opponents, each opponent *i* imposes a proprietary cost  $C_{pi} > 0$  if and only if he believes that the expected firm value exceeds the threshold  $K_i \in Y$ , where  $K_1 < K_2 < ... < K_n$ . This means that if the opponents<sup>13</sup> believe that firm value equals  $y \in [K_i, K_{i+1})$ , then the firm incurs proprietary costs  $C_{p1} + C_{p2} + ... + C_{pi}$  (see Figure 4.4).

Note that this generalized setup can also be used to vary the height of the proprietary cost with the opponent's beliefs. So instead of yes or no proprietary cost, the proprietary cost may, for instance, be absent for low firm values, low for average firm values, and high for high firm values.

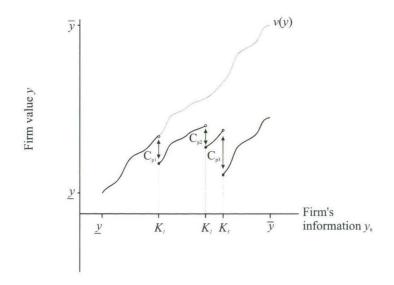


Figure 4.4: Firm value and proprietary costs with multiple opponents

<sup>&</sup>lt;sup>13</sup> Since all opponents behave rationally and possess the same information, they form identical beliefs about firm value.

#### 4.6 Implications of the model

Our analysis shows that in equilibrium a relatively good firm prefers private financing to public financing. In this regard, relatively good refers to the probability distribution of the private information that such a firm can receive. That a firm possesses valuable private information need not necessarily imply that the firm is of a relatively good type, for even a relatively bad firm may possess valuable information from time to time. As a result, a single profit figure is no unambiguous indicator of a firm's type. Indicators of a firm's type should provide information about the probability distribution of firm value like a (time) series of profit figures does<sup>14</sup> or a firm's long term profitability, i.e. a firm's permanent earnings. Regarding the latter as a reasonable indicator of a firm's type and assuming that a positive relation exists between the firm's proprietary information and its profitability, our results state that private firms are more profitable in the long term than public firms. This inference is in line with the empirical results of Brav and Gompers (1997), Loughran and Ritter (1995) and Ritter (1991) among others, who observe a long-run underperformance by IPOs.

In our model, the exogenous variables  $C_p, C_b - C_m$  and *K* partly determine the existence of the several financing equilibria. To illustrate the relation between the exogenous variables and a partial financing equilibrium consider the following example. Let the private information be described by  $\tilde{y}_{\tilde{\theta}} = \tilde{y} + \tilde{\theta}$  where  $\tilde{y}$  and  $\tilde{\theta}$  are uniformly distributed on the interval [0,1]. Hence, Y = [0,2] and  $\Theta = [0,1]$ . Figure 4.5 shows the existence of the different financing equilibria in relation to *K* and  $\frac{C_b - C_m}{C_p}$ : the ratio of the capital cost differential and the proprietary cost.

Since a full public financing equilibrium features skeptical beliefs of the opponent when observing private financing, private financing yields proprietary costs with certainty. In accordance with Theorem 2.1, we see that a public financing equilibrium always exists if public capital is relatively cheap compared to private capital. Reason for this is that a publicly financed firm may avoid proprietary costs with positive probability. Hence, public financing has a capital cost advantage and a proprietary cost advantage. In addition, if the proprietary cost advantage of public financing is sufficiently large compared to the capital cost disadvantage, a full public

<sup>&</sup>lt;sup>14</sup> To have a proper view of the profit figures over time, the time series should, of course, be appropriately adjusted for factors like economic growth and inflation.

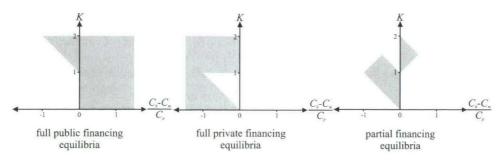


Figure 4.5: The existence of the different financing equilibria in relation to the exogenous variables

financing equilibrium may also exist in case that public capital is relatively costly. That such an equilibrium can only arise for K > 1 has the following explanation. If  $K \le 1$  then a firm of type  $\theta \ge K$  will always incur proprietary costs when it opts for public financing. Since in that case there is no proprietary cost advantage for public capital, this firm prefers the cheaper option of private capital.

As Figure 4.5 shows, full private financing equilibria can only exist if private capital is less costly than public capital. If  $K > E(\tilde{y}_{\tilde{\theta}})$ , then the opponent will not impose the proprietary cost on a privately financed firm. Since public capital yields proprietary costs with positive probability, private financing comes with a capital cost advantage and a proprietary cost advantage, so that all firms prefer private to public financing. Note, however, that even if the proprietary cost advantage of private financing is sufficiently large, a full private financing equilibrium cannot arise in case private capital is relatively costly. To see this, observe that a firm of type  $\theta < K - 1$  will not incur proprietary costs when it opts for public financing. Since in that case there is no proprietary cost advantage for private capital, this firm prefers the cheaper option of public capital. If  $K \le E(\tilde{y}_{\tilde{\theta}})$ , then the opponent will impose proprietary cost with positive probability, there is a proprietary cost disadvantage for private financing. Then a full private financing equilibrium only arises if private capital is sufficiently cheap compared to public capital.

For the partial financing equilibria, we know from Theorem 2.2 that the relatively good firms choose private financing, i.e.  $\Theta_b^* = [\theta^*, \overline{\theta}]$ . Figure 4.6 pictures the  $\Theta_b^*$  as a function of the threshold value K and  $\frac{C_b - C_m}{C_n}$ . It follows that partial financing equilibria only exist if the proprietary cost exceeds the capital cost differential, that is  $C_p \ge |C_b - C_m|$ . Furthermore, we can derive the following general implications for partial financing equilibria. First, more firms prefer private financing – i.e.  $\theta^*$  decreases – when the threshold value K decreases. Similarly, more firms prefer private financing when the ratio  $\frac{C_b - C_m}{C_n}$  decreases. Note, however, that the effect of proprietary costs depends on which type of capital is relatively costly. If private capital is relatively costly, that is  $C_b > C_m$ , an increase in proprietary costs makes private financing more attractive. The intuition is that when  $C_b > C_m$ , privately financed firms avoid the proprietary cost increases, then the expected proprietary cost of public financing increases so that private financing becomes beneficial for more firms. The opposite holds if public capital is relatively costly, that is  $C_m > C_b$ . In that case, privately financed firms incur proprietary costs in a partial financing equilibrium. If the proprietary costs increase, then the cost benefit of private financing does no longer outweigh the proprietary costs for the relatively bad privately financed firm. Hence, they prefer public financing.

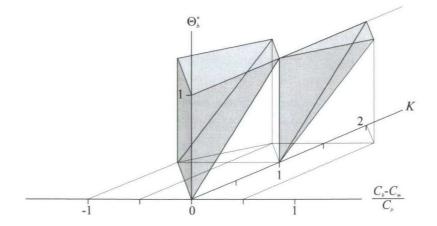


Figure 4.6: The attractiveness of private financing in relation to the exogenous variables K and  $\frac{C_b - C_m}{C_a}$ 

It is a straightforward exercise to show that similar interdependencies can be derived for the case in which public financing is subject to voluntary disclosure. Since Theorem 3.2 states that under a voluntary disclosure rule more firms go public in a partial financing equilibrium than under a mandatory disclosure rule, the interdependencies should follow similar trends in a voluntary disclosure environment. So, we pose that public financing occurs more often as the threshold value *K* increases or  $\frac{C_b - C_m}{C_p}$  increases. This assertion leads to the following implications.

When proprietary costs are positively related to product market competition, the cost of leaking proprietary information is relatively high for competitive markets.<sup>15</sup> As a result, one should observe more private firms in competitive markets where private capital is more costly than public capital. Two remarks are in place here. First, our model does not take into account differences in the risk of returns of different firms. Firms in highly competitive markets may have more risky returns, making the premium for bearing idiosyncratic risk in case of private financing higher. Instead, public capital markets allow better risk sharing opportunities. Hence, the capital cost differential for risky firms is larger and therefore it is difficult to say what overall effect an increase in product market competition has on the going-public decision. Second, if the ability to hide proprietary information in highly competitive markets is more difficult,<sup>16</sup> the influence of differences in the disclosure environments attached to the alternative financing opportunities reduces.

When proprietary costs are related to the entry of a new competitor on the product market, a market with high entry barriers may be represented by a high threshold value. Assuming that the proprietary costs resulting from entry are fixed, private financing should become more likely as the entry barrier increases. However, once we arrive in an equilibrium where partial financing is feasible, public financing should become more attractive as the entry barrier increases. This latter result links up with Chemmanur and Fulghieri (1999), who also suggest that firms from more capital intensive industries go public earlier.

<sup>&</sup>lt;sup>15</sup> Harris (1998), however, finds evidence that might point to a negative association between proprietary cost and competition. Her finding suggests that a reluctance towards disclosure is highest for firms enjoying abnormal returns. Assuming that abnormal returns are more likely in less competitive industries yields a negative association.

<sup>&</sup>lt;sup>16</sup> Competitive markets are typically characterized by less information asymmetry, e.g. because the competition for proprietary information is also higher in such markets.

As in Yosha (1995) our model supports findings of positive share price responses to the announcement of private equity or debt placements. Firms that are on to something good might choose to attract private capital to prevent having to disclose publicly about their investment plans. This consideration is also applicable in case of seasoned offerings.

Finally, our model may also have implications concerning the discussion about the unification of accounting rules across jurisdictions. To the extent that proprietary disclosure cost considerations influence a firm's financing decision, the decision to list on a domestic or foreign public capital market can be driven by differences in disclosure requirements. For instance, American public security markets are generally believed to be the most liquid markets. These markets, however, are also known to have the most stringent disclosure regimes.<sup>17</sup> Hence, a firm considering an (initial) public offering of securities might forego the liquidity advantage offered by the NYSE, ASE, or NASDAQ because proprietary cost considerations makes a listing to a less demanding disclosure environment more attractive. This result is in contrast with Huddart, Hughes and Brunnermeier (1999) who find that when several public markets compete in trading volume disclosure requirements increase. Their model considerably differs from ours, particularly in the modeling of the proprietary cost and how disclosure resolves the information asymmetry.

To return to our model, the proprietary cost argument might help to explain why we do not see all IPOs to be executed on American public capital markets. Moreover, our model predicts that it are the relatively worse (foreign) firms that will enter American stock exchanges. With regard to the ongoing efforts of harmonizing accounting rules worldwide, the former argument might explain why stock market authorities are reluctant in changing their disclosure requirements for listing to meet Generally Accepted Accounting Principles (GAAP). Uniform disclosure regulations across capital markets favors those markets that offer the least capital cost. Hence, representatives of less liquid capital markets, i.e. non-US capital markets, may oppose GAAP proposals that reduce disclosure flexibility in fear of loosing their competitive disclosure advantage. On the other hand, US market officials might oppose obscure accounting proposals in an attempt to protect their liquidity lead.

#### 4.7 Conclusions

This chapter has analyzed how differences in disclosure regulations between private and public capital markets may affect the firm's decision to go public. Disclosure regulations prescribe which of the firm's private information is subject to disclosure. Particularly, any confidential information that is subject to disclosure may lead to the firm incurring proprietary costs. In our study, the going-public decision is a trade-off between the difference in capital costs and the difference in proprietary disclosure costs. The main result of our analysis is that the relatively better firms remain private and that the relatively bad firms go public. The latter result might explain the existence of minimum requirements that generally apply to a listing at public capital markets.

Our model implies that firms for which proprietary disclosure cost considerations are important, are more likely to stay private as the private information that is proprietary in nature becomes more valuable. If this latter property can be associated with the value of growth opportunities, our model shows that the more valuable a firm's growth options, the more attractive private financing becomes. This implies that the recent tendency for young fastgrowing firms to enter public markets may say more about differences in capital costs, particularly with respect to the extent of overvaluation of companies in the high-tech industry, than that it says something about the relevance of confidential information in IPO decisions. Furthermore, our analysis confirms the general notion that more stringent disclosure requirements for public firms decrease the likelihood of an IPO due to an increase in expected proprietary disclosure costs.

There are of course several other factors influencing the public/private financing decision that may confuse proprietary disclosure cost considerations. A prominent candidate for additional public financing costs that are not considered in the present study, are costs stemming from agency problems between managers and investors. For as long as these costs are fixed, they can be captured in our model by broadening the definition of the cost of capital. It may well be, however, that these costs vary with the quality of the firm. Underinvestment problems like those introduced by Myers (1977) become more serious for lower quality firms. Chances that a firm's management creates or discovers profitable investments increases with the quality of the firm and its management. In instances where the firm's management wants to forego

<sup>&</sup>lt;sup>17</sup> Moel (1999) documents a difference in the rigor of disclosure rules across different American security mar-

positive NPV-projects, a few private capital investors has better opportunities to redirect the management's investment decision than a large group of public investors has. The introduction of such an agency cost may change our results in such a way that a disjoint set of privately financed firms arise in a partial financing equilibrium: besides the relatively better firms, also the relatively bad firm prefer staying private.<sup>18</sup> The latter do so to benefit from the private investors influence on management.

#### kets.

<sup>&</sup>lt;sup>18</sup> This equilibrium financing strategy is analytically explored in Appendix 3.A.

## **Chapter 5**

## The Dutch Disclosure Environment in Perspective

## 5.1 Introduction

The purpose of this chapter is to provide support for the notion that publicly held firms face more difficulties in managing their external information flows than privately held firms and, therefore, are more likely to leak proprietary information, in particular information related to product market competition. More specifically, the chapter focuses on the most important constituencies and institutions in the Dutch disclosure environment and their influence on Dutch disclosure practices of public and private firms. First, a model will be presented in which the characteristic elements that constitute the disclosure environment are structured. Next, these elements will be described for the Dutch situation in the 1980s and 1990s – the period from which we collected the data for the empirical research presented in Chapter 6. Finally, we will summarize the main differences between the disclosure environments of listed and nonlisted companies in the Netherlands at the end of the twentieth century and compare these findings particularly with the disclosure environment in the US.

## 5.2 A general description of disclosure environments

Describing disclosure environments can be done in several ways. One approach is an economical one in which disclosure can be seen as the outcome of a process of demand for and supply of information. The thesis focuses on corporate disclosures. Therefore, the attention is directed to firm-specific information,<sup>1</sup> i.e. financial or nonfinancial information whether or not reported in formal statements.

The demand for firm-specific information is derived from the improvement in decision making or monitoring that arises with its use (Foster, 1986, p. 9). For example, it can help investors select the best investment portfolio from alternative portfolios and it offers the possibility of having a contract defined in terms of a firm's accounting numbers. Regarding

<sup>&</sup>lt;sup>1</sup> Other information sets are related to the industry, the national and international economy.

the different parties that may demand firm-specific information, a broad set of constituencies can be distinguished. Beaver (1998) explicitly specifies the following groups: investors (including creditors), information intermediaries, regulators, management, and auditors. The FASB (SFAC 1, p. 24) has formulated a more extensive list of potential users of financial statement information: owners, lenders, suppliers, potential investors and creditors, employ-ees, management, directors, customers, financial analysts and advisors, brokers, underwriters, stock exchangers, lawyers, economists, taxing authorities, regulatory authorities, legislators, financial press and reporting agencies, labor unions, trade associations, business researchers, teachers and students and the public. The IASC framework (IASC, 1998, p. 36/37) mentions investors, employees, lenders, suppliers and other trade creditors, customers, governments and their agencies, and the public. Even more constituencies could be specified: ultimately the set of parties that make demands on corporations is open-ended (Foster, 1986).

Opposite the demanders of firm-specific information are the suppliers. The main suppliers of firm-specific information are the companies' managers. They are likely to possess the most information regarding their firms' businesses and can therefore be considered as the main source of firm-specific information. One can state that parties like financial analysts and the financial press also provide this type of information. However, the most original source of firm-specific information is the company's management, for it has the most direct access to this information.<sup>2</sup> The incentive for corporate managers to supply firm-specific information derives from a reduction in capital cost and contracting or agency costs.

Thus, corporate disclosure can be seen as a process that is structured by the forces of supply and demand. However, a prominent feature of most disclosure environments is the existence of institutions regulating and monitoring the information flow, indicating that if left to the forces of demand and supply alone, the allocation of firm-specific information may lead to undesirable effects. In most countries disclosures are mandated to a certain extent and laws against fraudulent disclosures are commonplace. Parties interested in corporate disclosures from this perspective have a derivative interest in corporate disclosure practices; their interest follows from the mere existence of an information need of other parties.

<sup>&</sup>lt;sup>2</sup> We ignore the possibility that information intermediaries, such as financial analysts and the financial press, could bypass the companies' management in getting access to firm-specific information, e.g. by hiring private investigator agencies.

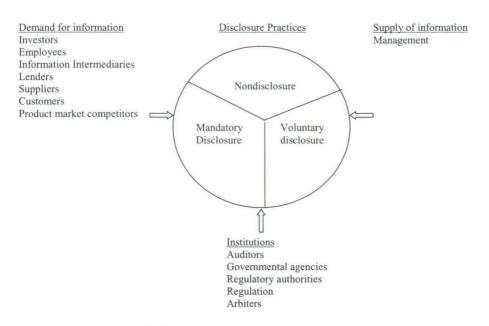


Figure 5.1: The general disclosure environment

One of the parties with an original interest in corporate disclosures that is commonly considered to be a very prominent party in the disclosure environment are investors.<sup>3</sup> Investors provide an important source of financing means and as such they have a natural and direct interest in information regarding the firm's status. In Anglo-Saxon countries the investor perspective regarding corporate disclosure is rather dominant. In these countries the common shareholder is usually seen as the most prominent investor. The perspective in most continental European countries is less focused on the interest of just one party. In Europe the interests of for example creditors, employees, and banks is generally considered to be at least of equal importance.

Summarizing, the corporate disclosure environment can generally be divided into three major elements, as illustrated in Figure 5.1. The first element constitutes the demand side, basically triggering companies to disclose privately held firm-specific information. The companies' managers – the main suppliers of firm-specific information – form the second element of the corporate disclosure environment. These two elements or forces underlie the third element:

<sup>&</sup>lt;sup>3</sup> In this text the term investor refers to the common equity and debt capital investor.

the institutional disclosure setting. Together, the three elements determine the disclosure practices, which consist of mandatory disclosures, voluntary disclosures and nondisclosures. The latter type of disclosure is naturally, given the premise that information is a scarce good. Not all privately held firm-specific information need to be disclosed, simply because under certain circumstances it can be too costly. The actual disclosures that we can observe will depend on the relative importance of the different elements that constitute the disclosure environment and the mutual relations that exist between these elements. The next section describes the main parties that are present in the Dutch disclosure environment and discusses their relative importance of the elements that constitute the Dutch disclosure environment and in which companies that are established in the Netherlands have to make their disclosure decisions.

## 5.3 The Dutch Disclosure Environment

In general, two disclosure configurations or settings are defined: the Anglo-American model and the continental model (Wolk and Tearney, 1997, p. 618). The Anglo-American model is characterized by the presence of a strong accounting profession, the somewhat limited role of government, the importance of securities markets for raising equity capital, and an emphasis on the true and fair view of audited financial statements. The continental model, on the other hand, has a relatively weak accounting profession; reflects a strong governmental influence on accounting regulation and organization, including the primacy of tax influences and the protection of creditors in financial statement presentation rather than investor needs; and emphasizes the importance of debt financing through major banks rather than through raising equity capital. According to Revsine et al. (1999) the Anglo-American approach is intended (at least in principle) to reflect underlying economic performance, whereas the continental approach is primarily aimed at conforming to mandated laws or detailed tax rules. The Dutch disclosure setting is generally believed to be more similar to the Anglo-American than to the continental model. Within the two basic models, however, there are important distinctions.<sup>4</sup>

<sup>&</sup>lt;sup>4</sup> Nobes (1984) describes a more detailed classification of accounting systems. He also distinguishes between two main classes that correspond with the dichotomy mentioned by Wolk and Tearney (1997). However, in his further detailing he considers the Dutch system as a special subclass that distinguishes itself from other Anglo-American systems by its strong business economics-oriented development and a strong accent on judgment instead of legal rules.

Below the Dutch disclosure setting will be described and compared to that of the US – the main jurisdiction within the group of countries that adhere to the Anglo-American setting.

## 5.3.1 The suppliers and demanders

As mentioned in the previous section, we will distinguish just one party with respect to the supply side of firm-specific information: the company's management, or more precisely the people within the company that are entrusted with the financial reporting task. Since financial reporting is generally seen as an important corporate activity, the upper management level is normally entrusted with it.

Demanders of firm specific information are much more diverse. Several parties can be distinguished that somehow have an interest in corporate disclosures and for that reason may influence disclosure practices. The number of interested parties and their influence on corporate disclosure environments is likely to differ across nations. Below follows a description of the most prominent interested parties in the Netherlands.

## Investors<sup>5</sup>

Investors are one of the most obvious parties that demand and are influenced by corporate disclosures. To a large extent, they provide the capital necessary to invest, directly or indirectly (i.e. by buying a claim on the firms' assets from initial investors), and therefore have a natural need for information that facilitates investment decision-making and monitoring activities. Investors' demand, however, is rather heterogeneous. In general, the demand for firm-specific information by investors will be a function of wealth, tastes (for example, attitudes towards risk) and beliefs about the future; moreover, investors may also differ in their access to information and their ability to interpret it (Beaver, 1998, p. 8).

Especially with respect to the last two points, there may be differences in demand between professional and nonprofessional users. Professional users, like investment fund managers and insurance companies, are more likely to be able to use more information sources in a more timely manner than non-professional individual investors, because of economics of scale. They can also impose more pressure on firms to disclose certain information. Further, they

<sup>&</sup>lt;sup>5</sup> See footnote 3.

posses more means to gain access to relevant alternative information sources and to recruit qualified personnel.

Within the group of nonprofessional users, differences in the demand for firm-specific information may be apparent, too. For example, some investors may choose to use the services of financial intermediaries (for example by investing in a mutual fund) or information intermediaries. In both cases a shift in demand for information is established from the individual investor to the intermediating parties. Further, the demand for firm-specific information may be a function of the extent to which an investor wants to diversify. An investor following a strategy that tries to replicate the market portfolio is probably less interested in firm-specific information if most of the risk associated with holding the stock is nonsystematic and thus can be diversified away. On the other hand, an investor who tries to capture abnormal returns by buying and selling mispriced shares based on fundamental analyses is likely to have a higher interest in firm-specific information. Furthermore, investment horizons differ across investors, which is likely to influence the quest for firm-specific information. Investors that follow a buy-and-hold strategy are probably less interested in timely, short-term information than investors who actively manage their investment portfolios.

Thus, one can conclude that within the group of investors there are large differences in wealth, tastes and beliefs as well as in access to information and the ability to interpret this information, resulting in a heterogeneous demand for firm-specific information. The degree of heterogeneity in the demand for firm-specific information by Dutch investors will be discussed below.

Until recently, the role of investors in the Netherlands was not as prominent as it has been in for example the United States. The distinct focus of the US regulators (the Securities and Exchange Commission (SEC) and the Financial Accounting Standards Board (FASB)) on the interest of investors is not recognized in the Netherlands.<sup>6</sup> For several decades the position of the employee has been perceived as important as that of the investor. With most of the official initiatives to change financial reporting practices in the Netherlands, employees or their repre-

<sup>&</sup>lt;sup>6</sup> The stronger investor focus of the SEC and the FASB can be explained by the fact that these regulatory agencies are only concerned with firms that are listed on the national securities markets (which are approximately 12,000 of the approximately 3.7 million US corporations (Zeff, 1995, p. 61)). Instead, in the Netherlands as in all other member states of the European Union much more companies are subject to the accounting regulations and therefore the regulators need to be much more attentive to the interests of others than public investors.

sentatives were present, which reflects the cooperation spirit of the Dutch economic governance structure (since the 1980s often referred to as the "polder model"). Very recently, however, initiatives have been unfolded aimed at increasing the role of the investor in the corporate governance structure, as witnessed for example by the establishment of the Peters committee in 1997.<sup>7</sup> A partial explanation for the more subordinated role of investors in the Netherlands is the relatively lower participation of individual investors in providing public capital. For years large international banks, pension funds and insurance companies have dominated the Dutch public capital market. Only recently the interest of individual investors in public capital investments has been growing, but still the large capital suppliers account for over sixty percent of the overall trade in the Netherlands.<sup>8</sup> Despite the dominance of just a few large parties on the Dutch public capital market this position apparently has not resulted in a similar influence of these parties on public disclosures. Only recently a change in the attitude towards a more active role in the governance of companies by pension funds, for example, is noticeable. Perhaps the monitoring of public firms by institutional investors in the Netherlands has largely been hidden from public view.

## Employees

The labor movement in the highly socially-oriented Netherlands has always had a prominent role in the economic organization structure, just like in many other European countries. Compared to the US, in the Netherlands the role of labor unions – as major representatives of the labor movement – in the corporate disclosure environment has been more important. For example, firms of a certain size have to publish a social report annually. Further, the establishment of a formal internal council of employees (called "ondernemingsraad") watching the interests of the personnel in larger Dutch firms, is required by law. The law that governs this institution requires management to inform its personnel via the council of important events and expectations. In short, the stake of employees in the corporate disclosure environment is firmly established in the Netherlands.

The presence of representatives of the labor movement in important historical initiatives that helped to create the present Dutch disclosure environment underlines the role of this inter-

<sup>&</sup>lt;sup>7</sup> The setting up of the Peters committee was a joint initiative of the Amsterdam Exchanges authorities (the "Nederlandse Vereniging voor de Effectenhandel") and the firms listed on it (which are formally united in the "Vereniging Effecten Uitgevende Ondernemingen") with the objective to give recommendations aimed at improving the Dutch corporate governance practice.

<sup>&</sup>lt;sup>8</sup> De Volkskrant, 8 December 1998.

ested party. In the 1970s a consultation committee was established, by ministerial order, from labor and employers' unions and the accountancy profession to list socially accepted norms regarding annual reporting. This committee, known as the "Tripartiete Overleg", published a series of views on annual reporting in the Netherlands known as the *Beschouwingen naar aanleiding van de Wet op de Jaarrekening van Ondernemingen*. In later years, this tripartite consultation initiative was formalized in an official council known as the "Raad voor de Jaarverslaggeving", and its published opinions were renamed in directives on annual reporting ("Richtlijnen voor de Jaarverslaggeving").<sup>9</sup> In the same period, another institute called the "Ondernemingskamer" was established that also highlighted the role of employees on reporting in the Netherlands. Its task was to further establish the legal norms with respect to annual reporting by judging cases that were brought by interested parties. Next to investors, the Ondernemingskamer also recognizes employees as an interested party, and as such it provides employees with a legal opportunity to influence Dutch corporate reporting practices.

#### Information intermediaries

Information intermediaries, such as financial analysts and the financial press,<sup>10</sup> are another group that can have a noticeable influence on corporate disclosure rules and practices. These parties channel the demand for firm-specific information and are so knowledgeable that they may act as serious opponents in the corporate disclosure debate. The extent to which information intermediaries as financial analysts and the financial press influence corporate disclosures in the Netherlands is questioned by Zeff et al. (1992). In comparison with the United States and the United Kingdom, there are just a few financial newspapers and financial analysts have organized themselves professionally on a much later date. This may imply that the role of information intermediaries in the functioning of the securities exchanges in the Netherlands is less important than in the aforementioned countries due to a lack of competition among intermediaries. The competition among analysts for disclosures and for the interpretation of disclosures may result in security prices that reflect a broad information system (Beaver, 1998, p. 10). Hence, a less developed information intermediaries industry may result in less efficient stock markets in the sense that some value relevant information is not processed in market prices or is processed only with delay.

<sup>&</sup>lt;sup>9</sup> With this formalization, the role of the employees in the council was reduced somewhat in that they could no longer be direct members of the different delegations of the council; instead they were entitled to appoint some of its members.

<sup>&</sup>lt;sup>10</sup> Other information intermediaries are e.g. bond rating agencies, stock rating agencies, investment advisory services, and brokerage firms.

#### Lenders

Lenders form another main group of demanders for firm-specific information. Prominent representatives of this group are banks.<sup>11</sup> Banks are the main suppliers of debt capital and for this reason they are likely to influence the firms' external information flow. Banks are commonly characterized by a relatively strong risk-averse attitude, expressed among other things by a strong focus on collateral, i.e. the value of assets in place. Financial reporting is especially aimed at recognizing and to a certain extent valuing (in terms of accounting values) assets in place. Furthermore, many banks have standard evaluation procedures stipulating that information relating to liquidity, leverage, profitability etcetera should be considered when determining the amount of the loan, the interest rate, the security to be requested, and the nature of the ongoing relationship (Foster, 1986, p. 6). Hence, one can expect a strong interest of banks in a firm's financial statements and accounting methods.

The banking industry is well developed in the Netherlands, which is shown by the relative number of large banks with a Dutch origin. Hence, a large influence on the disclosure practices of Dutch firms may be expected. But since the relation between banks and their borrowers is usually of a private nature, communications between the two parties is rather likely to be private. Thus, although the banking industry can be considered to be an interested party in the corporate disclosure environment, its influence on corporate public disclosure is less pronounced in general.

#### Other parties

Within the Netherlands the following parties can be added to the group of most influential demanders. Existing and potential suppliers and customers have a natural interest in a firm's condition because they are or can become direct claimants of cash, products or services. On the one hand, goods and services are supplied to the firm on credit; on the other hand, the firm has to deliver certain products that are already paid for by its customers. Furthermore, suppliers may be tied to long-term contracts, and customers may have entered into long-term service contracts. Also product market competitors are often mentioned as a party that is interested in and has an influence on a firm's disclosures. This thesis focuses especially on this party's influence on the communications between the management of a publicly held firm and investors.

<sup>&</sup>lt;sup>11</sup> Creditors can be considered as lenders, too.

On account of the institutional disclosure setting there is also a demand for firm-specific information. Parties with an interest in corporate disclosure from this perspective – in Figure 5.1 indicated with the general terms governmental agencies and regulatory authorities – are the subject of the next section.

## 5.3.2 The institutions

The corporate disclosure environment is generally characterized by the existence of institutions regulating and monitoring the disclosure process. If one strongly adheres to the forces of supply and demand, the reason of existence of these institutions can be explained in that they render a cost-effective solution to information allocation problems that arise in a free market setting.<sup>12</sup> As such the demand for firm-specific information executed by the institutions can be defined as a derivative demand emanated from regulating and monitoring tasks given to them by the financial community. Thus, these parties exist by the grace of a more fundamental quest for information. Whatever their reason of existence, the institutional setting determines the boundaries, i.e. minimal requirements, of corporate disclosure and is therefore generally believed to strongly influence corporate disclosure practices.

We want to divide the institutional disclosure setting into three parties. First, there are those that set the rules. Second, there are the rules (and the sanctions on breaking them). Third, there are the parties that enforce and explain the rules. In the following sections, these three main activities within the Dutch institutional disclosure setting are described.

## 5.3.2.1 The regulators

Generally, two regulatory bodies can be distinguished: public and private agencies. The main difference between the two is that rules enacted by public regulatory agencies are enforced by law. The influence of public regulators is potentially higher, because their regulatory power stems from a higher authority. However, the Anglo-American setting is generally characterized by a more limited role of public regulators and a more prominent role of private regulatory agencies. In the United States, for example, the power to set accounting standards for companies listed on national securities exchanges (and companies that are traded in the over-the-counter market, or have issued securities in interstate markets and have met certain minimum size tests (Zeff, 1995, p. 53)) has been given by the legislature to the SEC. Although the SEC is a public agency, it has delegated the authority to determine the accounting rules to the private sector embodied in the FASB.<sup>13</sup> In the Netherlands the private sector has also had a prominent role in the formulation of accounting standards. However, due to European integration and international accounting harmonization initiatives the perceived mandate and authority of the private sector regulatory agencies is being dismantled. Below, the main public and private Dutch regulatory agencies will be discussed.

The public regulatory body in the Netherlands is the Dutch parliament as the representative of the legislature. Parliament possesses the legal power to set accounting standards. As opposed to the United States, this power is not delegated to a special institution like the SEC. In the realization of the Dutch legal financial reporting framework as it presently holds, the following noticeable events can be mentioned. The year 1928 marks the first enactment of a financial reporting law; before this date firms had no legal obligation to report. This first corporate disclosure law was aimed at the larger, public limited liability companies (the "NVs") that were listed on the Amsterdam Exchanges Stock Exchange.<sup>14</sup> Since 1928, these companies were obliged to publish their annual reports, consisting of a balance sheet and a profit & loss account, by depositing these statements for public inspection at a special public agency called the "Handelsregister". It was not until the 1970s that the next main legal change in the Dutch financial accounting rules was established. The 1970s and 1980s witnessed more regulation, mainly because of the European harmonization of that time. European directives were issued to which individual legislation of the member countries had to be adopted.<sup>15</sup> The First Directive, dating from 1968, resulted in the enactment of the Law on the Annual Company's Account ("Wet op de Jaarrekening van Ondernemingen (WJO)") in 1971. Until 1971, the legislature left the assessment of financial accounting standards to the accounting profes-

<sup>&</sup>lt;sup>12</sup> Another point of view is that other than economic forces drive the establishment and behavior of institutions. As such, institutions can be seen as bodies that hamper the optimal allocation of firm-specific information.

<sup>&</sup>lt;sup>13</sup> The SEC, however, has the legal right to establish standards whenever it chooses. History has shown that the SEC has not been reluctant to intervene with the views of the FASB. See Zeff (1995) for a description of some of the tensions and disagreements between both agencies.

<sup>&</sup>lt;sup>14</sup> See footnote 4 of Chapter 1.

<sup>&</sup>lt;sup>15</sup> The harmonization of financial reporting regulation in the member states of the European Union was aimed at further enhancing the freedom of establishment for companies in order to facilitate the trade within the European community as well as cross border transactions. Harmonization of company law was felt to be necessary to provide an equal level of protection for shareholders, employees and other persons (mainly creditors) in all member states.

sion, but with the enactment of the law all public limited liability companies were obliged to publish annual accounts.<sup>16</sup> Further directives were issued by the European Union, such as the Fourth Directive, leading to a change in the Dutch Company Law in 1983. From this date on, all public and private limited liability firms had to publish annual reports.<sup>17</sup> In addition to this enlargement of the publication duty, more detailed standards were enacted with respect to the layout, audit and release of the annual report. Another prominent directive that changed the Dutch and other European corporate disclosure laws was the Seventh Directive. This directive, mainly addressing consolidating issues, was converted into Dutch law in 1988.

The Fourth and Seventh Directive did not apply to the banking and insurance industry. For this group of companies a special directive was issued, which was enacted in 1993. As a result, banks and insurance companies had to publish a divergent model of the balance sheet and income statement and were allowed to use different valuation methods. Further, no distinction is made after size or legal structure with respect to the reporting requirements of banks and insurance companies in the directive enacted in 1993.

Next to the aforementioned Directives that were aimed at company laws, European Community Directives regarding securities laws were issued. These directives apply to firms that are listed on an official stock market established in the European Union. With respect to the financial reporting requirements, the securities law directives refer to the company law directives with two important additional requirements. First, initial public offering firms have to publish a sources and uses of funds statement in the prospectus. Second, listed companies have to publish semi-annual reports. The European Directives on the harmonization of securities laws were enforced in the Netherlands in 1995.

Like most other industrialized countries, the Dutch financial reporting practices are hardly influenced by tax legislation. One of the reasons for this may be that until World War II company taxes were based on paid dividends rather than on accounting earnings, leading to a minor interest in income definition questions from tax authorities (Camfferman, 1997, p. 24).

<sup>&</sup>lt;sup>16</sup> Almost 90% of the approximately 50,000 public liability firms (NVs) existing at that time subsequently converted to the private limited liability firm structure (BV).

<sup>&</sup>lt;sup>17</sup> Next to public and private limited liability firms, the law also applies to cooperations ("Coöperaties"), mutual insurance companies ("Onderlinge waarborgmaatschappijen"), general partnerships ("Vof's"), limited partnerships ("CV's") and, as of 1997, unions and foundations that carry on a business. For small and medium-sized firms certain exemptions are allowed with respect to the audit and reporting obligation.

As a result, financial reporting in the Netherlands could develop independently from tax legislation, and a separate fiscal reporting practice emerged.<sup>18</sup>

With the enactment of the European directives, some progress was made with respect to harmonizing the national disclosure laws of the countries of the European Union. However, it is felt that further work has to be done. In this respect, the European Commission has announced that it will not issue further directives. Instead, attention will be directed to international initiatives on harmonization.

After having discussed the public regulatory history of the Netherlands, we will now turn to the private sector. The private sector has always had a prominent position in the Dutch corporate disclosure structure, which distinguished it from the other continental European countries. The nesting of this characteristic feature of the Anglo-American accounting model in the Netherlands is among other things related to the early development of the Dutch accounting profession. As early as about 1880 the Dutch accounting profession developed like the British one, and in 1895 the first national accounting organization was established. This early development of the accounting profession left detailed accounting standards out of the disclosure law of 1928 (Camfferman, 1997, p. 22). The assessment of the accounting standards was left to the accounting profession.

Just after World War II there was a transition in the corporate governance structure in Dutch industrial life. Until then Dutch companies were allowed to minimize their public disclosure, but now a demand for more openness emerged, because it was seen that the availability of information was important with respect to the realization of corporate governance structures. As a result the Dutch industrial life got involved in the assessment of accounting standards. In 1960 a formal consultation body, called the "Tripartiete Overleg", was founded on the initiative of employers. Besides employers this consultation body consisted of representatives of the accounting profession and the labor unions, with the purpose of producing recommendations with respect to annual reporting. Later, this body was renamed as the "Raad voor de Jaarverslaggeving". The important influence of the industrial life on the assessment of

<sup>&</sup>lt;sup>18</sup> Only in a few countries, for example France, are firms compelled to use financial reporting methods that

accounting standards is quite unique, and in this respect the Dutch accounting structure distinguishes itself from that of Anglo-American accounting practices.

Another private institute with a considerable influence on Dutch disclosure practices is the Amsterdam Stock Exchange, which is formally known as the Amsterdam Exchanges Stock Exchange (AEX). The listing rules of the AEX provide important disclosure requirements in addition to the legal requirements. These specific additional reporting requirements are the subject of the next section.<sup>19</sup>

### 5.3.2.2 Disclosure rules and sanctions

Corporate disclosure environments are generally characterized by the existence of institutions regulating the disclosure process. Products of the regulatory industry are disclosure rules and the sanctions on breaking them. These rules and sanctions can have a legal basis, i.e. they are embodied in the law, or they can be the result of initiatives by the markets themselves, i.e. selfregulation. In this section, we will discuss corporate disclosure rules; subsequently, we will deal with the sanctions that are connected with these rules.

With respect to disclosure rules laid down in the law, two types can be distinguished: first the antifraud rules; and second, the rules that explicitly mandate disclosure. The main difference between the two is that antifraud rules prescribe what not to do, whereas mandated disclosure rules prescribe what must be done.

Antifraud provisions are fairly commonplace in the sale of a variety of commodities<sup>20</sup> and they reflect concern over the pervasive problem that the quality of the product or service that is sold is uncertain and that one party has superior information regarding quality (Beaver, 1998, p. 161). These provisions are meant to deter fraudulent behavior via legal liability.

conform to taxation rules (Revsine, Collins, and Johnson, 1999, p. 7).

<sup>&</sup>lt;sup>19</sup> Interesting to note with respect to the influence of securities exchanges is the recent establishment of a new stock exchange by five of the larger European stock exchanges, under which the AEX, for relatively small and young companies, known as the Euro.NM. The Euro.NM has introduced some additional disclosure requirements such as quarterly reporting. In the near future (i.e. as from 2001) the AEX will probably merge with the stock exchanges of Brussels and Paris to form a pan-European exchange called Euronext. The disclosure consequences of a possible merger are not known, yet. <sup>20</sup> The common existence of antifraud provisions reinforces the empirical relevance of expectations that can be

derived from the antifraud rule models in accounting (see Chapter 6).

However, such provisions are generally seen as insufficient in regulating corporate disclosure, judging from the existence of other regulatory mechanisms such as laws mandating disclosures.<sup>21</sup>

In Dutch legislation the antifraud rules with respect to corporate disclosure are laid down in the Criminal Code. The legal provisions are found in the Civil Code, predominantly in Title 9 of Book 2. These rules and provisions outline the legal framework to which the annual reporting practices have to conform. The basic article from the Civil Code with respect to annual reporting is Article 2:362, which states that the annual report should provide such a view that a justified opinion can be formed about the capital, performance, solvency and liquidity of the firm. The notion "view" is rather slippery. According to the legislator, this view should start from the values and norms that hold in society. Despite the much higher extent of detail in the present financial reporting laws due to the European harmonization initiatives, the characteristic Dutch reporting latitude has not totally disappeared. Firstly, the Dutch accounting profession together with the industrial sector, embodied in the RJ, still has a role in the promulgation of accounting standards. Secondly, the law explicitly dictates the reporting of additional information<sup>22</sup> or even the deviation from the law<sup>23</sup> in case this is seen as necessary to obtain a true and fair view. Apparently, the Dutch legislator does take the line that obeying legal requirements does not necessarily lead to a true and fair view.

All large and medium-sized companies<sup>24</sup> that are covered by Title 9 of Book 2 of the Civil Code are legally required to appoint a certified public accountant to audit the financial information disclosed in the annual account. Title 9 applies to public as well as private legal liability companies ("NVs" and "BVs", respectively), cooperations ("Coöperaties"), mutual

<sup>&</sup>lt;sup>21</sup> Beaver (1998, p. 162) mentions three major arguments as to why relying on antifraud provisions alone could be inadequate: (1) the existence of externalities and market failure, (2) the asymmetrical or uneven possession of information among investors, and (3) the incentive of corporate management to suppress unfavorable information.

<sup>&</sup>lt;sup>22</sup> Examples are the decrees "Van der Giessen-De Noord" and "Zinkwit". The first case concerned the necessity to report governmental subsidies in net sales although not explicitly mentioned in the law. The second case touched the specification of important mutations in the balance sheet entry provisions.

<sup>&</sup>lt;sup>23</sup> An example is the valuation of listed securities at market prices although the law requires historical costing.

<sup>&</sup>lt;sup>24</sup> More specifically, a firm is large according to the law if it meets at least two of the following criteria: total assets are higher than NLG 24 million, net sales are higher than NLG 48 million, and the number of employees is higher than 250. A firm is medium-sized if it meets at least two of the following criteria: total assets are higher than NLG 6 million, net sales are higher than NLG 12 million, and the number of employees is higher than 50. In all other cases a firm is considered to be small. The cut-off points have been reset a couple of times in recent years; the ones mentioned hold since 1995.

insurance companies ("Onderlinge waarborgmaatschappijen"), general partnerships ("Vof"s"), limited partnerships ("CVs"), and as of 1997 unions and foundations that carry on a business.

The auditor is a party somewhat difficult to position in the representation of the corporate disclosure environment as it is defined in this chapter. Although the law nowadays secures its position in most of the western countries, the audit profession generally existed long before the legislature introduced the audit as a legal requirement.<sup>25</sup> Hence, a market on which audited information is traded could well exist without governmental interference. Therefore, we could also position the auditor as a party with a direct interest in firm-specific information. As such, an auditor might be considered as an active player on the market for verified firm-specific information. As suppliers of this type of information auditors can be seen as part of the supply side on the market for firm-specific information. Beaver (1998), for example, positions the auditor as such in the disclosure environment.

However, more fundamentally, auditors can also be seen as a party with a demand for firmspecific information. In their capacity as verifiers of information, auditors have a natural demand for verifiable firm-specific information. Firms on the other hand have an incentive to let their firm-specific information be verified, emanated from a legal obligation or, more fundamentally, from a desire to enhance the information content of their disclosures; therefore, a market for verification or audits can exist. This market can be considered as a "derivative" market, with the market for firm-specific information as the "underlying" market. If it were the case that a demand for firm-specific information did not exist, then there would be no demand for audits regarding this type of information either – not the other way around. From this perspective the position of the auditor can be compared to that of the information intermediary. The information intermediary stands in between the company and the investment public, just like the auditor. And if we compare bond rating agencies (a representative of the information intermediary industry) to the audit industry, no fundamental difference between the two parties is apparent; both parties are paid by the company, and their reason for existence can be explained by delivering an information content increasing service. Hence,

<sup>&</sup>lt;sup>25</sup> There is evidence that firms provided accounting reports long before these reports were required by law (Benston, 1969). The Dutch auditing profession, for example, originated in the 1880s, whereas the legal audit requirement has been adopted in the company law since 1971 (Schilder, 1997, p. 267). See also Buijink (1992, Chapter 4).

the auditor is essentially also an information intermediary. The only actual difference between the two parties is that in most Western countries nowadays the position of the auditor is secured by mandate.

The Dutch disclosure law stipulates the notion that the annual report should provide a true and fair view. This view is tested on the basis of norms that are considered to be socially acceptable. The judiciary, embodied in the "Ondernemingskamer" (OK) and the highest Dutch court (the "Hoge Raad"), as well as the private sector, represented by the RJ, are entrusted with defining these norms. The OK and the Hoge Raad judge in pending cases. The RJ issues directives with regard to annual reporting, called "Richtlijnen voor de Jaarverslaggeving", which are believed to be very influential, although these directives are not legally valid and there are no sanctions to noncompliance.

The AEX is another institution that influences the Dutch disclosure practice. The AEX sets disclosure rules to companies that are listed on the main public capital market in the Netherlands embodied in the "Fondsenreglement". The Fondsenreglement contains the following main requirements with respect to disclosure. If they are established in one of the member states of the European Union, companies are obliged to draw up their financial reports in accordance with the legal provisions of the member state; if not, the financial reports have to be drawn up in accordance with similar provisions. If a company is listed on more than one exchange, it has to provide the Dutch market with information that at least equals the information provided to other exchanges (as far as this information is value-relevant). Furthermore, companies listed on the AEX are obliged to publish semi-annual accounts (see also the discussion on securities laws in Section 5.3.2.1), in which they must report on at least net sales and accounting earnings plus a series of notes, within four months after the end of this reporting period. The notes should mention all particular influences on the figures and contain all data on the basis of which the user can form a judgment regarding the development, activities and results of the firms. These semi-annual reports do not have to be audited. Another important aspect of the additional disclosure requirements for companies listed in the Netherlands is that they are obliged to inform the public at once of every fact or event that may have a significant effect on the share price. The AEX authorities can also request listed companies to publish certain additional information of which it believes to be important for investors or, after consultation, publish this information independently. Furthermore, listed companies have to report to the exchange authorities on all private placements of equity capital or convertibles. Finally, there is a legal obligation to publicly disclose every considerable change in the corporate shareholder structure.<sup>26</sup>

With respect to its disclosure requirements the AEX differentiates between initial offerings, seasoned offerings and continuous requirements, of which the requirements in case of equity offerings are the most comprehensive. With initial or seasoned equity offerings a prospectus has to be published containing at least the following information:

- personal information on the members of the executive board and the supervisory board;
- information on affiliated companies;
- detailed segmented information on activity and geographical origin;
- information on new products or services;
- information on research and development policies and processes;
- information on the dependence on patents or licenses, industrial, commercial, and financial agreements or new production processes;
- the places of business that provide at least 10 per cent of sales or production;
- staffing and development therein;
- important ongoing investments and investments over the last three years including the financing (excluding present attempts to acquire an interest in other firms);
- future expectations including the ongoing accounting year;
- audited annual reports of the last three years;
- statements of sources and funds or cash flow statements over the last three years;
- elucidation on lawsuits or disputes that are expected to have an important effect on the firm's financial position.

So far, only the general content of the disclosure rules has been discussed. Another important aspect of disclosure is its timeliness and, in the context of this section, the rules that govern the timely dissemination of mandatory disclosures. In order to be useful for decision-making purposes, disclosures need to be released in a timely manner. Otherwise, concurrent media may have released the relevant data or the revealed information is too outdated so that it has

<sup>&</sup>lt;sup>26</sup> This public announcement is required in case a stake of 5, 10, 25, 50, of 66<sup>3</sup>/<sub>2</sub> per cent in the total shares (or certificates thereof) of a public limited company has been acquired or crossed (upwards as well as downwards).

become useless.<sup>27</sup> In the Netherlands firms have to publish their financial reports within five (public and private limited liability firms) or six (other firms) months after the closing of the accounting year. This term can be extended in certain cases with a period of six or five months, respectively. After expiration of each term, the company's management has to file the financial report within two months. Thus, within thirteen months after the accounting year is closed, the financial report has to be published.

Publication according to the law means that the required reports have to be filed at the Chamber of Commerce where the company is registered. In addition to the annual report, it concerns the directors' report and the supplementary information. With respect to the last two reports, a firm can instead of filing at the Chamber of Commerce make an announcement that these reports can be looked into at the office of the company.<sup>28</sup>

Disclosure sanctions are another aspect of the institutional arrangements that commonly structure the disclosure process. Disclosure rules are more effective if there are sanctions on noncompliance. Sanctions on breaking the Dutch disclosure law consist of a fine, imprisonment, or both. Initial fines for not disclosing the annual report can be as high as NLG 25,000 and may result in a maximum of six months of imprisonment of the firm's directors (Bollen, 1996, p. 64). These sanctions can rise to a fine of maximal NLG 100,000 and imprisonment of maximally 6 years if the firm's directors do not comply with the order to disclose. A further consequence of neglecting one's legal obligations regarding the administration and publication of financial information may be the abolition of the limited liability of directors. If the director's have not duly performed their tasks for a period of three years before a bankruptcy, they are severally liable for the firm's total debts. The law assumes unduly performance of the director's tasks if the legal administration and publication obligation is not fulfilled (Beckman, 1997, p. 138).

In addition to the aforementioned sanctions that follow an economical offense, more severe sanctions may be imposed if the offense is a criminal one. Generally, companies can be held

<sup>&</sup>lt;sup>27</sup> From a product market competitive perspective, the delay in publishing financial statements might be preferred. In a study by Carsberg et al. (1985) it is found that for small firms the main reason for the lack of interest in competitors' accounts was the fact that these figures were outdated.

<sup>&</sup>lt;sup>28</sup> A small company does not have to file a management and supplemental report. Also, its annual report may be confined to a balance sheet with an explanatory note. A medium-sized firm may leave out from the financial report some of the supplemental information and may summarize a few of the balance sheet entries.

legally responsible for all damage suffered as a result of the publication of a deceptive state of the company's affairs. A study by Skinner (1994)<sup>29</sup> has found that managers of companies listed in the United States behave as if this cost of litigation is a serious threat and consequently influences their disclosures. In the Netherlands, however, the chances of proving deceptive behavior in court are rather slim, as are the adjudged satisfactions for the damages suffered, which is likely to result in a lower litigation threat in the Netherlands compared to the United States.

The formal task of checking filed accounts in the Netherlands lies with the "Economische Controle Dienst (ECD)". The investigation activities of the ECD, however, have been rather small in recent years. Only just after the adoption of the Fourth Directive in 1984, did the ECD intensify its scrutinizing duties. In 1985 it checked the accounts of 12,000 firms of which 50 per cent were fined, but in 1988 only 3,810 companies were checked of which 33 per cent were fined (Poorthuis, 1990).

## 5.3.2.3 The arbiters

The influence of regulators on corporate disclosure practices depends largely on the extent to which compliance to the rules can be enforced. The extent to which compliance can be enforced is positively related to the chance that a company is caught after breaking the rules and the sanctions involved. The two most prominent supervising institutions with respect to complying with legal disclosure rules in the Netherlands are the OK and the "Stichting Toezicht Effectenverkeer (STE)". The OK is entrusted with exercising supervision on complying with the Dutch Company Law and the STE on complying with the Dutch Securities Law. Separate supervising institutions have been set up for the banking and insurance industry. The Dutch central bank monitors the functioning of the Dutch financial industry, and an institution called the "Verzekeringskamer" monitors the Dutch insurance industry and pension funds.

The OK is a legal body that comes under the court of justice of Amsterdam. It was founded in 1970, with the passing of the new company law. The special task the Dutch regulators had in mind for the OK was to further explain legal annual reporting standards. This supporting

<sup>&</sup>lt;sup>29</sup> See also Francis, Philbrick and Schipper (1994).

function of the OK is emphasized by the passive role it had been assigned: the OK is not allowed to independently investigate single annual reports; it can only judge in cases brought before by interested parties. It is interesting to note that the OK only recognizes the following parties as interested parties: shareholders, holders of certificates of shares (i.e. shares with dividend rights only), employees and the employees' councils (Beckman, 1997, p. 129).<sup>30</sup>

The OK functioned well especially at the end of the 1970s and in the early 1980s. Relatively many cases were brought before the OK during this period. In this respect the efforts of one person in particular, Pieter Lakeman, have to be mentioned. As an executive of the foundation SOBI ("Stichting Onderzoek Bedrijfsinformatie"), he played an important part in the more active role of the OK during this period. Since the OK cannot act independently, it is depended on the initiatives of others. In the 1970s and early 1980s the SOBI, or to be more exact Pieter Lakeman, more or less acted as the prosecutor of the Dutch financial reporting society. With the disappearance of the foundation by the end of the 1980s, the number of OK judgments decreased dramatically and so did its influence on Dutch financial reporting practices.

The STE was founded in 1988 by the AEX with the purpose of supervising its various exchanges. Since 1989 the STE supervises the different securities exchanges by order of the Minister of Finance. Until recently, its activities consisted primarily of supervising the self-regulation of the exchanges, i.e. it supervised among other things the compliance with the securities regulations. Actual monitoring of compliance with the rules was delegated to a special monitoring agency ("Controlebureau") of the AEX. This changed in 1996, when the STE set up its own monitoring agency and got the legal means to impose fines and sanctions. It can be concluded that the supervisory function of the STE until 1996 was of little importance, also judging from several scandals around that time. Only in the last few years did the influence of this supervising institution increase considerably, caused predominantly by a broadening of sanctioning possibilities and the establishment of an own monitoring agency.

<sup>&</sup>lt;sup>30</sup> The attorney general of the court of justice of Amsterdam is also allowed to bring cases before the court in the public interest.

## **5.4 Dutch Disclosure Practices**

In Section 5.3 the different elements of the Dutch disclosure environment have been discussed. The description provides an impression of the parties and forces that govern the corporate disclosure practices in the Netherlands. To improve the insight into the relative importance of the different elements and their interactions, it may be helpful to discuss actual disclosure practices. In this section empirical evidence regarding the extent of compliance with disclosure regulations and the extent of voluntary disclosure by Dutch companies will be addressed.

#### 5.4.1 Dutch compliance

Evidence on compliance with Dutch financial reporting requirements is rather scarce – as it is for most countries within the European Community.<sup>31</sup> In the Netherlands a few compliance studies have been executed. These studies, however, have mainly investigated the compliance of small and medium-sized nonlisted Dutch companies. Although these studies cannot be held representative of the whole Dutch reporting community, their findings may be indicative.

Bollen (1986) studied 94 annual reports of Dutch firms from the accounting year 1984, of which 64 reports were from small firms and the remaining reports were from to medium-sized firms. His results show a considerable deviation from disclosure requirements in especially the annual reports of smaller firms. A similar research published in 1986 by a Dutch Association of Accountants ("Nederlandse Orde van Accountants-Administratieconsulenten") reviewed 150 financial statements from 1984. Of these, a vast majority did not comply with the rules. Both studies refer to the year 1984 in which Dutch small and medium-sized firms were first subject to mandatory disclosure rules. Hence, the disclosure imperfections may be part of a learning process and need not be indicative for large Dutch firms, who had to comply with mandatory disclosure regulation for a longer period of time. A study by Roos (1992), who partly replicated both above mentioned studies, shows evidence of initial disclosure problems for small and medium-sized firms. Based on his results, he concludes that disclosures in 1990 are generally more in compliance with regulatory requirements compared to 1984. Nevertheless, almost all (97 per cent) of the annual reports of 30 small firms were still

<sup>&</sup>lt;sup>31</sup> The Dutch regulatory system does not provide for a systematic check of all annual accounts filed at the Chambers of Commerce. As we explained earlier, in the Netherlands the formal task of checking the filed accounts lies with the ECD.

disclosed after the latest date permitted, and also none of the studied accounts fully complied with the legal requirements.

#### 5.4.2 Voluntary disclosure

Mandatory disclosures alone do not determine disclosure practices. In addition to disclosures that are governed by accounting standards, managers can disclose voluntarily. It is rather difficult, however, to determine how many of all corporate disclosures can be defined as voluntary disclosures, and it is even more difficult to determine the effect. If corporate disclosure fulfills an important role in the functioning of capital market, as it is broadly maintained, different disclosure regulations may lead to differences in the functioning of stock exchanges. On the one hand, more and more rigid disclosure rules may lead to more clarity and may thus reduce adverse selection costs. On the other hand, it may lead to more difficulty in optimally reporting underlying economic reality and it may even lead to the waste of economic resources to achieve desired accounting results (Palepu, Healy and Bernard, 2000). In theory, the effect of different disclosure systems could be assessed by the extent to which securities prices of capital markets on which these systems are applied on average deviate from their full information prices. Hence, if two capital markets, say the AEX and the New York Stock Exchange, have equal information-efficient prices, the perceived differences in both disclosure systems apparently have had no effect on performance, perhaps because differences in voluntary disclosure practices have undone the differences in both disclosure systems. Hence, an insight into the extent and quality of voluntary disclosures is necessary to assess overall corporate disclosure performances.

Little research has been done on the extent of voluntary disclosure in the Netherlands. A noteworthy exception is Camfferman (1996). He studied voluntary annual report disclosure by listed Dutch companies for the period 1945-1983. Camfferman concludes that at an elementary level a rather substantial extent of voluntary annual report disclosure can be ascertained in the period 1945-1983. Throughout this period, companies were found to continuously expand their disclosure, the result being that many items were already disclosed by a considerable number of companies before disclosure was made mandatory after changes in the law (Camfferman, 1996, p. 266). The perceived degree of voluntary disclosure by Dutch listed companies in this period can be explained as a characteristic of Dutch financial reporting practices. But because financial reporting in the Netherlands in these years was

unregulated for a longer period of time than in many other countries, the perceived degree of voluntary disclosure by Dutch managers can also be the result of the fact that Dutch disclosure legislation lagged behind. Especially for multinational operating firms, it is not unreasonable to assume that they want to comply with international accounting practices to compete for capital in a supranational context. Definitely in favor of the Dutch financial reporting practices, however, may speak Camfferman's finding of that in many respects financial reporting in the Netherlands developed parallel to financial reporting in the United Kingdom, and there were no great differences in voluntary disclosures between the two countries. Since the United Kingdom is generally regarded as being ahead of other European countries in terms of the development of financial reporting, Dutch reporting practices may be regarded as being fairly advanced in Europe (Camfferman, 1996, p. 272). Compared to the United States, however, disclosure in the Netherlands typically lagged behind, although the gap appeared to narrow during the period 1945-1983 (Camfferman, 1996, p. 271).

Although Camfferman's results may be considered outdated, his findings may be indicative of the general attitude of Dutch managers towards voluntary disclosure. The period he studied runs to 1983, the year in which the Dutch company law was adapted to the Fourth Company Law Directive of the European Union (at that moment called the European Economic Community). This change in company law may have influenced the degree of voluntary disclosure by Dutch companies. Unfortunately, little to none research has been done on the change in the extent of voluntary disclosure after the enactment of the new company law. An exception is Bollen (1996), who investigated the change in the extent of voluntary disclosure of small and medium-sized Dutch firms for the accounting years 1984 and 1990.<sup>32</sup> Before 1984 small companies - virtually all private companies - were exempt from mandated financial accounting. As of the accounting year 1984, much more firms<sup>33</sup> had to publish an annual report. In an attempt to assess the degree of voluntary disclosure of small Dutch firms with respect to the new financial reporting regulation and its development, he found an increase in the number of accounts with voluntary disclosures and an increase in voluntary disclosed items per account since 1984 (Bollen, 1996, p. 83). Of course, these findings need not be indicative of the disclosure practices of large, listed firms for one reason because they were already obliged to disclose publicly well before 1984. These firms probably did not experience as

<sup>&</sup>lt;sup>32</sup> Bollen defines small and medium-sized companies in accordance with definitions as they are embodied in the company law. See footnote 24 for the exact definitions.

<sup>&</sup>lt;sup>33</sup> See footnote 17 for the firm types for which the legal public disclosure requirement holds since 1983.

many problems adjusting to the new regulatory environment as small companies at the same time.

#### 5.5 Summary and positioning of the Dutch disclosure environment

The previous sections have presented a general description of the elements that constitute the Dutch disclosure environment, which are illustrated in Figure 5.1. The configuration of these elements influences disclosure practices. In the context of the thesis, we are especially interested in the differences between the disclosure environments of publicly and (large) privately held firms. In this section the main differences between these two different types of firms will be summarized. Furthermore, the Dutch disclosure characteristics will be compared to characteristics of the US environment in order to assess the extent of generalization of the Dutch disclosure setting.

With respect to the demand for information the publicly held firm distinguishes itself from the privately held firm mainly by the presence of a large group of unknown shareholders. This interested party can only be informed via public channels. The functioning of the public securities market is positively related to the degree of which information is released evenly among the interested parties. Securities market authorities usually do the utmost to accomplish a level playing information field. In the Netherlands the AEX authorities and the STE watch over the adequate and timely dissemination of information by listed companies; in the US the SEC mainly exercises this task. As a result of public shareholdings, a firm also increases the intention of information intermediaries like financial analysts and the financial press, which further enhances the demand for public disclosures. The information intermediaries' industry, however, is developed far more in the US than in the Netherlands.

The second main element that governs disclosure practices concerns the institutions. In the Netherlands, accounting standards are prescribed by legislation (Title 9 of Book 2) in conjunction with a private-sector agency (the RJ) that fills in a task left to them by the legislature by publishing recommendations with respect to financial reporting that are in accordance with the norms that hold in society. With respect to accounting standards there is no difference between listed and nonlisted firms, and all firms are legally required to appoint a certified accountant to verify the financial information disclosed in the annual account. The requirements only differ on the basis of firm size. This is different in the US, where the standards as

well as the overall regulatory system for financial reporting only apply to companies listed on national securities exchanges.

The Dutch regulatory system, however, does provide additional disclosure rules for listed firms that are laid down in securities law and the listing requirements of the AEX. The Dutch securities law for example requires the publishing of semi-annual reports and inclusion of a cash flow statement in the prospectus that accompanies a public offering of securities. The listing requirements of the AEX prescribe that a firm offering securities must disclose more detailed segmental information and more forward looking information, such as information on current R&D activities and important investments. Furthermore, the AEX requires (listed) firms to inform the public at once of every fact that is likely to have a significant effect on a firm's share price. Hence, one can conclude that a publicly held firm in the Netherlands has to meetadditional accounting and disclosure requirements that increase the pressure to disclose fully, correctly and timely. In the US the step from a privately held to a publicly held company is likely to have an even greater impact on a firm's disclosure practices, the more so since the accounting and disclosure standards are more comprehensive and more stringent.

Another aspect of the institutional disclosure setting is the securing of the actual compliance with the accounting and disclosure standards. In the Netherlands the formal task of checking filed accounts lies with the ECD. The supervision efforts of the ECD, however, have rather been small. Also, the Dutch institutions that are entrusted with the task to supervise the compliance with legal accounting and disclosure rules, the OK and the STE, have been rather passive. Only very recently (since 1996) has the influence of the STE increased considerably due to ministerial intervention, making the STE a more independent supervisory body. The supervisory climate in the Netherlands during the 1980s and the early 1990s is in sharp contrast to that of the US. The SEC has been known to have applied a heavy hand to enforcement of accounting and disclosure (1994)) is higher than in the Netherlands, where only a few cases are known. Hence, it can be concluded that enforcement in the US is more effective than in the Netherlands, that is with respect to the financial reporting and disclosure of public firms. This notion emphasizes the relatively larger change of the disclosure environment of IPO firms in the US.

Summarizing it can be concluded that the publicly held firm commonly faces a higher pressure to disclose due to additional disclosure rules and an increase in monitoring. In particular, the higher pressure to disclose emerges from: (i) additional disclosure rules set by securities exchanges that are enforced by special supervising bodies, (ii) higher public scrutiny due to the presence of public investors and the consequent increased intention by financial analysts and the press, and (iii) a higher risk of being the subject of a conflict of interests due to a higher public involvement in and awareness of the firm which will lead to a more widespread effect of possible (negative as well as positive) events. As a result, the possibility to protect its proprietary information is generally smaller for the publicly held firm and therefore public firms will face higher proprietary disclosure costs than private firms. The possibility to protect proprietary information, however, differs across jurisdictions. Especially, the change in the disclosure environment of US IPO firms is likely to be larger than it is for Dutch IPO firms.

In the next chapter we will empirically investigate the influence of proprietary disclosure costs related to product market competition by comparing different characteristics of competition between firms that went public on the AEX between 1984 and 1995 and firms that could have gone public in the same time period.

## Chapter 6

# The Association between Product Market Competition and Expanded Voluntary Disclosure

## **6.1 Introduction**

Does honesty pay or is it true that silence is golden? Questioning these notions of common wisdom is at the heart of the disclosure literature that studies the phenomenon of voluntary corporate disclosure. One of the basic questions addressed in this literature is why the management of some firms discloses a great deal of information (i.e. "be honest") and the management of other firms sometimes withholds (i.e. "be silent about") information that is useful for the valuation of the firm.<sup>1</sup> From an economic perspective it can be concluded that the decision to either disclose or withhold information depends on the costs and benefits of expanded disclosure. So far, the benefits related to expanding disclosure have been given much more attention in the empirical accounting literature on disclosure than the cost related to expanded disclosure. Botosan (1997) and Healy, Hutton and Palepu (1999) provide evidence that expanded disclosure reduces undervaluation and enhances liquidity (see also Welker, 1995). Skinner (1994,1997) and Francis, Philbrick and Schipper (1994) support the idea that managers expand disclosure, particularly the disclosure of bad news, in order to reduce the cost of litigation. The empirical research presented in this chapter aims at providing support for the existence of costs related to expanding disclosure. According to the analytical disclosure models discussed in Chapter 2, the main costs of disclosure in general occur from providing proprietary information to opposing parties (Verrecchia, 1983), and, in particular, from providing competitors with helpful information (Darrough and Stoughton (1990), Wagenhofer (1990), Newman and Sansing (1993) and Gigler (1994)). This chapter investigates the existence and role of competitor-related proprietary disclosure costs by relating product market competition to expanded voluntary disclosure.

<sup>&</sup>lt;sup>1</sup> With this comparison we particularly refer to the anti-fraud rule models in accounting (see Chapter 2), in which disclosure is truthful per definition. Hence, if one is privately informed and engaged in a transaction, the disclosure of private information can be referred to as an act of honesty, whereas silence can be interpreted as a form

Increasing our insight into the relation between competition and corporate disclosure is important for several reasons. First, accounting regulatory bodies as well as capital market authorities are concerned with the informativeness of corporate disclosures. This concern is expressed in the number and rigidity of accounting and disclosure rules in order to increase the comparability of performance among firms and reduce the opportunities for managing earnings. However, standardization of accounting and disclosure practices may also decrease opportunities to protect competitor-related proprietary information and, thus, increase proprietary disclosure costs. This effect should be of concern to accounting regulators and the results of this study may increase their insights on this issue. Secondly, since disclosure costs are likely to be lower in private capital markets (Healy and Palepu, 1993), insight into the effect of differences in disclosure requirements between public and private capital markets on proprietary disclosure costs should be of interest to security exchange authorities as well. From a social perspective this issue is also of paramount importance. The Dutch government, for example, has expressed its concern with respect to the financing opportunities of small, growing companies, because these firms have predominantly provided the increase in employment in the Netherlands in recent years. From this perspective, it is also interesting to know what the potential effect of proprietary disclosure costs is on the firms' financing opportunities. Similar to the common possibility of patenting, it may be that society can benefit by allowing some discretion with respect to public disclosures.

In the current literature different measures have been used to capture the extent of expanded voluntary disclosure. As overall measures of disclosure, Lang and Lundholm (1993) (see also Healy, Hutton and Palepu (1999)) propose analysts ratings, whereas Botosan (1997) uses a disclosure index. More specific measures of disclosure are used by Frankel, Johnson and Skinner (1996), who look at conference calls, and Harris (1998) who uses the precision of a firm's segment reporting as voluntary disclosure medium. Because these measures of disclosure are not easily available to our research sample of Dutch firms, we use another one: the initial public offering (IPO). Firms that enter a public capital market for the first time experience a considerable change in their disclosure environment as well as their corporate governance structure, which results in a higher likelihood of leaking proprietary information. In general, public firms have to obey to additional disclosure rules, and public disclosures are generally monitored more severely, which decreases the opportunities for managing disclosure are analysis and the proprietary disclosures are generally monitored more severely.

of cheating. The emphasis on the anti-fraud rule assumption can be supported by the common wisdom that truth

sures. The IPO prospectus is an obvious example of an additional (public) disclosure requirement, and the additional supervision by capital market authorities as well as the increased attention of financial analysts and the financial press explains the increase in monitoring. In addition, the governance structure of an IPO firm will change in that more and anonymous investors will be concerned with the firm. This will likely increase the demand for timely and undifferentiated information to prevent the uneven distribution of information among investors. Therefore, we postulate that going public<sup>2</sup> will result in an increased likelihood of leaking competitor-related proprietary information, for it increases the pressure on and, consequently, decreases the flexibility of a firm's disclosure (see Chapter 5 for an elaboration on this point). Thus, more specifically, our research can be described as an attempt to provide evidence for the influence of competitor-related proprietary costs on the degree of a firm's openness, which is measured by the initiation of an IPO.

In order to find evidence for the existence and role of competitor-related proprietary disclosure costs, we will compare the competitive environment of IPO firms with that of firms that are in a position to go public: potential IPO firms. The data needed to execute this investigation are generally not available, but they do turn out to be available for the Netherlands. The Dutch rules with respect to annual reporting are set by the law and related to the size of the firm. As a consequence, we have access to a sample of audited financial information of all public as well as private firms. Further, we have access to a unique sample of potential IPO firms. The availability of these data makes the Dutch setting a promising place to study why companies render themselves voluntarily to a more demanding public disclosure regime. It is arguable, however, whether findings based on the Dutch setting are easy to generalize. Compared to, for instance, the United States and Great Britain, the stock market in the Netherlands plays a more limited role in the economy. In addition, accounting settings, particularly with regard to the difference between private and public capital markets, differ across countries. However, the Netherlands are quite similar to other Continental European countries with regard to the role of public capital markets (see La Porta et al. (1997)) and the accounting system (European Community Directives). Therefore, the results of our study may be of interest to other jurisdictions as well.

will opt out.

<sup>&</sup>lt;sup>2</sup> The terms "initial public offering" and "going public" are used interchangeably throughout this chapter.

For a total of 73 IPO firms and 786 potential IPO firms, we will estimate a logit model of the decision to go public as a function of a number of measures for product market competition. The following measures of competition are included in this analysis: the average ratio of tangible assets to total assets in an industry, the four-firm concentration ratio and a measure for the speed of profit adjustment in an industry. The model controls for firm size, capital constraints, ownership structure and risk. The results show that the firm's competitive environment is related with the incidence of going public. Firms from capital-intense industries, measured by the average proportion of tangible assets to total assets in an industry, are less likely to go public. This finding indicates that the degree of openness of firms and thus the incentive to disclose voluntarily is lower if the threat from outside competitors is lower. Further, we find that the likelihood of going public is lower for firms that compete in industries in which capital intensity is relatively high and concentration relatively low. This result is consistent with the Marra & Suijs (MS) model presented in Chapter 4, if the capital intensity and concentration of industries are reasonable proxies for the threshold value and proprietary costs, respectively. However, if the measure for the speed of profit adjustment is combined with the capital intensity in an industry, the results do not support the model.

# 6.2 Previous empirical research on corporate voluntary disclosure<sup>3</sup>

Much of the early empirical research on corporate voluntary disclosure has focused on the properties of management earnings forecasts.<sup>4</sup> The motivation for these prior studies resulted from policy initiatives released by the SEC in the 1970s, which firstly allowed and later on even encouraged enclosure of forecasts in the formal SEC-filings. Following these changes in SEC-policy, researchers were predominantly interested in the informational value of forecasts to investors (see, e.g., Patell (1976) and Penman (1980) and the predictive accuracy of management forecasts (see, e.g., Ruland (1978)). Generally, the early studies suggest that management forecasts are price informative and more accurate than analyst forecasts. A second general line of research on voluntary disclosure has focused on characteristics of voluntary disclosure firms and the disclosures these firms release. Because of a variation in the degree of voluntary disclosure amongst firms, interest was raised in the characteristics of the more open firms. Although some controversy exists on the consistency of certain characteristics.

<sup>&</sup>lt;sup>3</sup> For an extensive overview of the empirical literature on voluntary disclosure see Healy and Palepu (2000).

<sup>&</sup>lt;sup>4</sup> King, Pownall and Waymire (1990) summarize and evaluate the early empirical research on voluntary corporate disclosure.

teristics, voluntary disclosing firms are larger, more profitable, growing more rapidly, and they use external financing sources more often than other firms do (Lev and Lundholm, 1993). We know about the disclosures of the more open firms that they are infrequent (Lev and Penman, 1990), and that good news releases are as likely as bad news releases (McNichols, 1989), and that voluntary disclosures come in various shapes.<sup>5</sup> Next to (quantitative and qualitative) management earnings forecasts, which are the focus of early studies, researchers have investigated press releases (Gibbins, Richardson and Waterhouse, 1990), conference calls (Frankel, Johnson and Skinner, 1996), investor relation programs (Lang and Lundholm, 1993), and Management Discussion and Analysis (MD&A) disclosures (Clarkson, Kao and Richardson, 1999).

During the 1990s the focus in empirical accounting research shifted from an interest in the properties of corporate disclosures and the characteristics of disclosing firms to an interest in the direct benefits of disclosure. A paper by Skinner (1994) can be considered as one of the first studies in this particular area. Skinner examines voluntary disclosures of bad news in relation to stockholder lawsuits. His findings support the suggestion that the disclosure activities of especially small and lesser-known US-firms are mostly the result of litigation and reputational concerns related to negative earnings surprises. The firms from his sample act as if they want to mitigate or avoid litigation and/or reputational costs by voluntary releasing bad news disclosures. In a similar study Francis, Philbrick, and Schipper (1994) find that pre-emptive voluntary bad-news disclosures may not be unambiguously conceived as an ex-ante defensive mechanism in order to avoid or mitigate litigation costs. They find that for the sample of firms that experienced a shareholder lawsuit the incidence of voluntary early disclosures is much higher than for the sample of firms that had the largest earnings and sales declines during the period of research. Hence, the reason for not being sued by shareholders does not seem to result from the incidence of voluntary early bad-news disclosures.

Welker (1995) examines the relation between a firm's long-term disclosure policy and liquidity in equity markets. He finds that firms with a more forthcoming disclosure strategy

<sup>&</sup>lt;sup>5</sup> A peculiar result, suggesting that the disclosure behaviour of firms in the US might have changed in recent decades is reported by Lang and Lundholm (1993): prior studies on earnings management forecasts suggest that firms tend to disclose good news more frequently, while research focusing on later time periods indicates that bad news disclosures are released just as frequently. Skinner (1994) provides an alternative explanation for this finding. The early studies focused mostly on point or range estimates of annual EPS and excluded qualitative

have lower bid-ask spreads, which indicates that these firms succeed in reducing information asymmetry and hence enhancing market liquidity. Frankel, McNichols and Wilson (1995) study the relation between management earnings forecast behavior and external financing. More specifically, they examine whether tendencies to disclose earnings forecasts are motivated by long-run corporate disclosure policies or more clustered around security offerings. Their results show that firms act as if they believe that increased disclosure enhances firm value and that earnings-related forecasts are part of a long-run disclosure strategy.

Healy, Hutton and Palepu (HHP, 1999) also deliver evidence that managers increase voluntary disclosure in an attempt to reduce undervaluation of their firms' stock. By using a timeseries approach they find that following expanded disclosure the capitalization rate of earnings growth significantly increases, even for firms that do not show earnings improvements following the increased disclosure. Further, HHP show that the number of public capital issues (predominantly debt issues) significantly increases during the year in which the disclosure strategy is being changed, suggesting that stockholders benefit from an increase in disclosure thanks to increased flexibility in raising new capital at a lower cost. HHP also find evidence of a decline in the dispersion of analysts' forecasts, a decline in relative bid-ask spreads and an increase in analyst-following and institutional ownership after firms have expanded their disclosure. Finally, they report that the exercise of stock options by the CEOs of the sample firms significantly increases in the two years following the disclosure expansion, which indicates that the increase of disclosure could also be explained by self-interested actions of managers. Lang and Lundholm (1997) find that firms significantly increase their disclosure activities before a seasoned equity offering. Starting about six months before the offering, firms make more frequent disclosures about their performance, provide more details and more management interpretations of their results and generally are more optimistic in their statements, compared to the previous six months. Further, they find evidence that the increase in disclosure is accompanied by an increase in stock returns, which can be explained both by a reduction in adverse selection costs and hyping. Botosan (1997) provides evidence of a negative relation between the cost of equity capital and level of disclosure. Using a selfconstructed disclosure index, she finds that in 1990, as a result of disclosure activities, the cost of equity capital decreased for forthcoming firms in the machinery industry. Similarly,

disclosures that pre-empt the information in quarterly earnings releases, while bad disclosures typically tend to be of the latter type.

Sengupta (1998) finds evidence that expanded disclosure results in a lower cost of debt capital.

The research presented in this chapter is to a large extent related to a study by Harris (1998). Harris also looks at the relation between characteristics of a firm's competitive environment and the incidence of voluntary disclosure. For a sample of companies listed in the US, she finds evidence for a positive relation between competition (measured by the four-firm concentration ratio and the speed of profit adjustment in an industry) and voluntary disclosure (measured by whether or not operations are reported as business segments). Her findings imply that reservation towards disclosure due to rivalry concerns emerges from a tendency to protect abnormal profits, which are generally assumed to be more common in less competitive industries. The results of Harris are partly consistent with the MS model (presented in Chapter 4), which also predicts that the likelihood of staying private and, thus, of non (public) disclosure size is smaller in highly competitive industries. However, the MS model also predicts that the incentives for non (public) disclosure are relatively low in industries with low rivalry, and, hence, that the relation between voluntary disclosure and competition is more complex. In this chapter we will provide empirical evidence that supports this prediction in the MS model.

### 6.3 Hypotheses development

This research seeks to find evidence for the influence of competitor-related proprietary costs on corporate voluntary disclosure by studying the IPO choice. If IPO firms can be characterized by marked changes in their disclosure environment (as documented in Chapter 5) and if disclosure can be seen as a strategic – i.e. value creating – corporate activity (as discussed in Chapter 2), the decision to go public has to be connected with the disclosure decision. However, little to nothing is known about the mutual relationship between financing and disclosure and, more specifically, about the role of proprietary or confidential information in the going-public process. The MS model presented in Chapter 4 is an attempt to fill this apparent gap in the literature. In this section testable hypotheses will be derived from this model.

Going public implies a form of external financing. There are two general motives for firms to seek external financiers. First, a firm may need external capital to initiate new investment projects and secondly, a firm – or actually its owner(s) – may want to sell private stock hold-

ings. As can be seen in Table 6.1, in recent years both motives for seeking outside financiers have prevailed with most of the IPOs on the Amsterdam Exchanges Stock Exchange  $(AEX)^6$ . Instead of a public offering, a firm can offer its claims privately, for example, to a venture capitalist, an informal investor, or an institutional investor. In the context of this research we want to abstract from differences among these alternative private external financing opportunities. The distinguishing feature between the different capital markets relevant to the present study is their disclosure environment. Although differences may exist between communicating with a venture capitalist and, for example, an informal investor, the most important disclosure differences can be detected between private capital markets in general and public capital markets. Therefore, in the remainder of this study we want to concentrate on the choice between private offerings and initial public offerings.<sup>7</sup>

We focus on IPOs since an IPO particularly marks a change in the disclosure environment of a firm. This change especially manifests itself in an increase of the pressure to disclose, which naturally leads to a higher chance of leaking proprietary information. Hence, we expect disclosure costs and in particular proprietary disclosure costs to be higher for firms that finance publicly. On the other hand, public capital is generally assumed to be cheaper than private capital for firms that have access to public capital markets.<sup>8</sup> The trade-off between the marginal disclosure and capital costs is the central issue in the empirical research presented in this chapter. More specifically, the analysis concentrates on the issue whether and how firms or their managers balance the marginal competitor-related proprietary disclosure costs against the capital cost differential related to public and private capital.

The cost-benefit of public capital over private capital may stem from several sources. A public listing of securities is generally believed to offer claimholders better diversification opportunities and higher liquidity (Pagano, 1993). Furthermore, in case of public financing,

<sup>&</sup>lt;sup>6</sup> See footnote 4 of Chapter 1.

<sup>&</sup>lt;sup>7</sup> The private offering does not have to be an initial external offering. In this study the concept of interest is the first introduction to the public capital market.

<sup>&</sup>lt;sup>8</sup> See Section 3.2 for a discussion on this issue. Especially, on a short-term basis the contrary may also be true. Agency problems, for example, may make the managers of the firm consider public financing as a last resort (cf. Myers and Majluf, 1994). However, the perspective in this chapter is predominantly an informational one because the disclosure models used to derive the research hypotheses disregard agency problems. Of course, we will control for agency considerations. First, the research methodology is such that the effect of short-term deviations from the optimal long-term capital structure is mitigated. Variables are measured, namely, mostly as an average over a period of five years. Secondly, variables associated with agency problems are added to the empirical analysis as control variables.

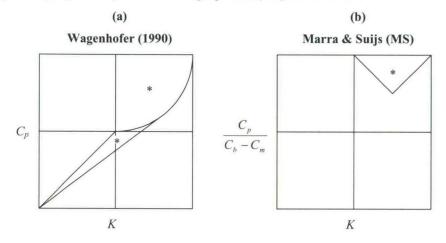
information production and search costs are lower, since trading and information disseminating activities are more centralized (Pagano and Röell, 1998). In addition, monitoring activities on the stock market may entail certain benefits, such as the possibility to write more efficient contracts by using the stock price (Holmström and Tirole, 1993). A public listing may offer more awareness with investors (Merton, 1987) and consumers and it may function as a certification for financial market professionals (Röell, 1996). Moreover, it may offer the firms greater financing opportunities (Rajan (1992) and Pagano, et al. (1998)). Going public may also expand remuneration opportunities, in that firms are in a position to offer their personnel equity-linked payments, which can be useful to motivate employees and enhance a firm's attractiveness towards good personnel.

If going public is related to disclosure, disclosure models may in principle be useful in understanding this prominent financing phenomenon. However, the current disclosure models (see Chapter 2) do not explicitly take into account a firm's financing opportunities for deriving the optimal disclosure strategy. In this respect the MS model, described in Chapter 4, extends the existing literature by explicitly taking into account the relation that may exist between financing and disclosure. On the one hand, the model introduces the idea that a firm might forego a public offering, and choose a private offering if the expected marginal proprietary disclosure costs related to a public offering are too high. On the other hand, it explicitly links the decision to go public to the analytical disclosure literature. First, by using the "anti-fraud rule" assumption (see Chapter 2), which can be considered as a formal representation of the whole accounting apparatus,<sup>9</sup> and secondly, by implementing Wagenhofer's (1990) disclosure model as a representation of the institutional environment in which public disclosure can be exercised.

<sup>&</sup>lt;sup>9</sup> Although not all disclosure models in accounting use the anti-fraud rule assumption (see for example the cheap-talk models of Newman and Sansing (1993) and Gigler (1994) discussed in Section 2.6), the assumption of truthful reporting in the context of going public seems, generally, to be more appropriate. The information revealed in the IPO process is backed up by the firm's board of directors, which formally has to sign the prospectus for verifying its content, while most of the financial information is verified by an auditor, and the public offering is accompanied by an investment bank whose reputation will be at stake.

### Figure 6.1: A comparison between the conditions for the existence of partial disclosure or partial financing equilibria in Wagenhofer's (1990) and Marra and Suijs' (MS) model, respectively<sup>10</sup>

The illustration of the MS model is based on an example elaborated in Section 4.6 in which the costs of private capital exceed the costs of public capital and public firms are compelled to fully disclose their private information. Outside the areas denoted with a \* only full disclosure equilibria (Wagenhofer) or full financing equilibria (MS) are sustainable.



In the MS model (cf. Wagenhofer, 1990) the effect of product market competition on the degree of the openness of firms depends on two measures of rivalry: a threshold value of private information and the proprietary costs that are imposed, if the competitor believes that the private information will exceed the threshold value. Wagenhofer shows that if competition can be defined as a function of a threshold variable and the proprietary costs, firms of average quality<sup>11</sup> are likely to be more open than other firms. He also demonstrates that the number of opportunities for strategic or partial disclosure is the highest if both variables are relatively high. Furthermore, Wagenhofer's model implies that the opportunity for strategic disclosure is not present in highly competitive industries – i.e. industries with low threshold values and high proprietary costs – as well as in lowly competitive industries – i.e. industries with high

<sup>&</sup>lt;sup>10</sup> The figure representing the MS model is based on the variant in which public firms have to fully disclose their private information. In case of voluntary disclosure opportunities the figure will not change significantly. In a voluntary disclosure environment the number of firms that prefer public financing in a partial financing equilibrium will at least be as high as in a mandatory disclosure environment (cf. Theorem 3.2c). Hence, when public firms are allowed to disclose their proprietary information voluntarily, the number of exogenous variables for which partial financing equilibria are sustainable will not exceed that in a mandatory disclosure environment.

threshold values and low proprietary costs. Considerations of rivalry dominate the first case, whereas capital market considerations dominate the second. In situations where both variables are low, strategic disclosure is possible, although less likely than in situations where both variables are high. Hence, Wagenhofer predicts that in highly competitive industries (i.e. industries with relatively high proprietary costs and relatively low threshold values) as well as in lowly competitive industries (i.e., industries with relatively low proprietary costs and relatively high threshold values) full disclosure will occur. Further, he states that in moderately competitive industries partial disclosure may occur. Hence, proprietary disclosure cost considerations only make a difference in moderately competitive environments. These results are illustrated in Figure 6.1a.

The MS model provides a similar view compared to that of Wagenhofer. It also predicts that proprietary disclosure considerations are most significant if both the threshold variable and the proprietary costs are relatively high, in case private capital is more expensive than public capital.<sup>12</sup> In contrast with Wagenhofer, however, strategic disclosure opportunities cease to exist for other values of the threshold value and the proprietary costs. Furthermore, the MS model implies that in order to make strategic public disclosure be viable these exogenous variables have to be relatively higher than in Wagenhofer's model. These findings are illustrated in Figure 6.1b. Note that the shaded areas represent combinations of exogenous variables for which proprietary disclosure considerations may influence the disclosure decision or financing decision, respectively. In the Wagenhofer-model, this means that proprietary disclosure costs may lead to partial or strategic disclosure equilibria instead of full (non-strategic) disclosure equilibria, whereas in the MS model they may lead to partial financing instead of full public financing equilibria. Thus, in Wagenhofer's model certain firms may be silent and conceal their proprietary information, whereas in our model they may conceal their proprietary information by means of private financing. In both instances the expected proprietary disclosure costs are reduced. This reduction related to the release of proprietary

<sup>&</sup>lt;sup>11</sup> Wagenhofer defines quality as the possession of private information that is positively associated with firm value.

<sup>&</sup>lt;sup>12</sup> Note that this similarity depends on the properties of the capital cost differential. As long as we may assume that the capital cost differential is constant or relatively constant with respect to proprietary costs, the similarity will occur. Differences in the costs of private and public capital may stem from several sources (see Section 3.2). The MS model focuses on differences in proprietary disclosure costs related to public and private offerings, while taking into account possible other factors that may affect the financing decision by allowing the capital cost differential to vary. When considering liquidity and diversification, the capital cost differential is generally believed to be in favor of public capital. Liquidity and diversification are more market specific than firm specific, which makes the similarity plausible.

information represents the value of strategic disclosure. Instances in which strategic disclosure is viable are less likely in the MS model, because in our model non-disclosure entails additional costs, namely those of private capital. Therefore, the negative effect of competition has to be higher than in Wagenhofer in order to sustain strategic financing/disclosure behavior. This is an intuitive explanation as to why, in contrast to Wagenhofer, partial (financing) equilibria are not present in the MS model for low values of the competitor-related exogenous variables. Thus, the first hypothesis that can be derived from the MS model runs as follows:

H-1: Relatively high values of both the threshold value and the proprietary costs increase the likelihood of private financing.

A robust result from the MS model is the finding that firms with the highest quality of proprietary information opt for private financing in a partial financing equilibrium. This result is independent of changes in the disclosure environment and the capital cost differential. Usually, in the case when the costs of private capital exceed the costs of public capital, partial financing equilibria can only be sustained if privately financed firms are certain they incur no proprietary costs, otherwise these firms would have gone public. Under this condition the high-quality firms have the highest incentive to conceal their proprietary information, for the expected proprietary costs related to public financing are the highest for these firms. In the event that the costs of public capital exceed the costs of private capital, partial financing equilibria can only exist if it is certain that private financing entails proprietary costs, otherwise all firms would prefer private financing. Hence, the high-quality firms are again the ones for which private financing is the most attractive option, since for these firms the expected reduction in proprietary costs related to public financing is the lowest. These results do not significantly change once we allow for voluntary (public) disclosure for public firms alone, or for both public and private firms. The possibility of voluntary disclosure increases the opportunities to avoid the imposition of the proprietary costs. This value of disclosure flexibility broadens the set of firms that choose to go public, but does not change the basic finding that high-quality firms choose to stay private. If the quality of proprietary information is positively related to profitability, which is a common conjecture, the second hypothesis can be formulated as follows: 13

<sup>&</sup>lt;sup>13</sup> Alternatively, one can assume that proprietary information is positively associated with firm value, that is, the more valuable the proprietary information, the more value of the firm it represents. Then, the firm that loses the

H-2: Privately financed firms that are in a position to go public are on average more profitable than publicly financed firms.

### 6.4 Research Design

This research is aimed at providing evidence of the influence and role of competitor-related proprietary costs on corporate disclosure. To provide such evidence, we will use a logit model to assess whether a manager's decision to go public is related to various measures of competition. In addition, we will control for size effects and risk by including the logarithm of total assets in the regression and the debt-ratio, respectively. Furthermore, we will control for concurrent explanations why firms could be restrained from going public by including the following variables: growth in sales, profitability, number of large shareholders, age of the firm, and the presence of a family or venture capitalist interest in the equity capital of the firm. In the remainder of this section we will describe how the variables are measured and present the empirical model.

## 6.4.1 Variables measurement

The dependent variable is coded 0 or 1, depending on whether in the period 1984-1995 a firm from the sample executed an IPO on the AEX. If, during this period, a firm went public, the dependent variable will be coded 1, otherwise 0.

We will use various measures of competition to assess the relation between aspects of competition and going public. The theoretical framework used in this study defines product market competition as a function of a threshold value and proprietary costs. The threshold value is an indicator of the probability that the proprietary costs will be imposed. The probability of imposed proprietary costs can be related to the concept of entry barriers of industries (as in Wagenhofer, 1990).<sup>14</sup> It is generally believed that high entry barriers are

most by publicly releasing its proprietary information need not necessarily be the most profitable firm. Firms with important information for their rivals need not per se be the most profitable firms.

<sup>&</sup>lt;sup>14</sup> Also within an industry the existence of entry barriers is conceivable. Within one industry several strategic groups may exist each with their own entry barriers. The concept of the entry barrier with regard to strategic groups, however, is similar to that of entering industries. A difference may be that a potential entrant from a strategic group within the same industry might face a lower entry barrier than a potential entrant from a different industry. In our analysis we do not distinguish between industries and strategic groups. By selecting industries at a three-digit classification level, we expect to sufficiently derive a demarcation between competing firms.

negatively related to competition. Therefore, the higher the entry barriers, the lower the probability that proprietary costs will be imposed. A common entry barrier is the industry's capital intensity. We will estimate the capital intensity of an industry by the average value of the ratio tangible to total assets of all firms in an industry.<sup>15</sup> Investments in R&D and advertising can also act as barriers to entry. However, our data fall short to meaningfully measure these barriers to entry.<sup>16</sup>

The proprietary costs which are imposed on a firm, once one or more<sup>17</sup> competitors undertake an adverse action, are more difficult to observe. It is likely, however, that this variable is related to the competitive behavior within an industry. The natural notion regarding the relation between competition within an industry and proprietary costs is that these variables are positively associated. Hence, we assume that the adverse reaction of competitors – i.e. the proprietary cost – in relatively collusive industries is less severe than in more competitive industries.

Sutton (1990) provides a theoretical justification of the differentiation between entry barriers and rivalry within an industry. He describes a simple two-stage game of competition. In the first stage of the game, firms can enter a specific product market by incurring fixed irreversible set-up costs. In the second stage the entered firms set their respective prices. Since the irrecoverable element of fixed costs, incurred on entering the industry, constitutes so-called sunk costs, its level plays no role in determining the firm's day-to-day pricing policy (Sutton, 1990, p. 28).<sup>18</sup>

<sup>&</sup>lt;sup>15</sup> The capital intensity of an industry could also be estimated by the relative capital expenditures in the industry. Data on the capital expenditures of firms, however, are only provided for a minority of the sample.

<sup>&</sup>lt;sup>16</sup> Our data-set primarily consists of financial reporting data. The relative importance of R&D and marketing in an industry is difficult to deduce from financial reporting data because of the general accounting problem of how to capture the value of intangible assets. However, the firm's R&D and sales expenses may be indicative of the relative importance of these barriers to entry. For the total sample of IPO- and non-IPO firms only 54 firms (6.3%) have actually reported activated R&D expenses (R&D expenses were reported even less) and 129 firms (15%) reported sales expenses in at least one of the years from which the data were collected. Both the short-comings of financial reporting with respect to capturing the value of intangible assets, and the lack of sufficient information about R&D and sales expenses we refer to Table 6.4. The low incidence of reporting sales expenses and especially capitalized R&D expenses may reflect an endogenous nature of both variables – i.e. management may withhold this information due to considerations of rivalry.

<sup>&</sup>lt;sup>17</sup> The results of our model remain valid if we allow more than one opponent with divergent thresholds (see Section 4.5.3).

<sup>&</sup>lt;sup>18</sup> In Sutton's model the intensity of price competition in the second stage may, however, influence the entry decision in the first stage: the greater the degree of price competition, the lower the post-entry profits and the fewer the number of firms choosing to enter.

Conform Harris (1998), we use the four-firm concentration ratio and an estimate of the speed of profit adjustment as a measure of competition between firms within an industry. The concentration ratio is a measure for the distribution of market shares within an industry and reflects competition for market share between large and small firms in an industry. An estimate of industry concentration is the m-firm concentration ratio, which is defined as:<sup>19</sup>

$$\sum_{i=1}^{m} \frac{s_i}{S}$$

where:

 $s_i = \text{firm } i$ 's sales;

S = the sum of sales, s, for all firms in the industry;

 $\frac{s_i}{S}$  = firm *i*'s market share;

m = the largest m firms in the industry.

Prior studies document a positive relation between the concentration of industries and profitability, which indicates that concentrated industries might on average be more collusive or that firms which are in a position to earn rents on a long-term basis can more easily obtain larger market shares (Bain (1956), Brozen (1971a, 1971b) and Demsetz (1973, 1974)).

The second measure of competition within an industry – i.e. the speed of profit adjustment – is derived from more dynamic models of competition which focus on the ability to maintain abnormal returns and the speed with which these returns are reduced or adjusted to a normal rate of return (see e.g. Mueller (1977, 1986), Conolly and Schwartz (1985) and Levy (1987)). Following Harris (1998), we estimate the speed of adjustment for positive abnormal returns within each industry as the persistence of return on assets (ROA) above the industry's average. The reason for looking only at the speed of adjustment of positive returns is that prior empirical research (Conolly and Schwartz, 1985) demonstrates different rates of profit adjustment for firms with below-average versus above-average rate of returns. Comparing returns of individual firms with the industry's average ROA rather than with the sample- or economy-wide average ROA is motivated by the argument that this allows us to control for

<sup>&</sup>lt;sup>19</sup> An alternative measure for concentration within an industry is the Herfindahl index. Harris (1998) reports no marked differences between the Herfindahl index and the four-firm concentration ratio. For that reason we do not use in our analysis the Herfindahl index as an alternative measure for concentration.

differences in industry-specific accounting methods which are unrelated to competition (cf. Harris, 1998). Accordingly, the speed of profit adjustment is estimated by the following regression:

$$X_{ijt} = \alpha_{0j} + \alpha_{1j} (X_{ijt-1} D_n) + \alpha_{2j} (X_{ijt-1} D_p) + \varepsilon_{ijt}$$
(6.1)

where:

 $X_{ijt}$  = the difference between firm *i*'s ROA and the average ROA for its industry, *j*, in year *t*;  $D_n$  = 1 if  $X_{ijt}$  is less than or equal to zero, otherwise 0;  $D_n$  = 1 if  $X_{ijt}$  is greater than zero, otherwise 0.

The speed of profit adjustment for above-average ROA per industry is captured by the slope coefficient  $\alpha_{2j}$ . A positive and significant coefficient suggests that a firm is able to maintain above-average returns within its industry. The larger this coefficient, the easier it is to perform above-average in the industry and, thus, the less competitive that particular industry appears.

Equation (6.1) is estimated separately for each industry that is distinguished in this study by using pooled cross-sectional time-series data for the period 1990-1996.<sup>20</sup> Industries are defined as being based on the three-digit BIK ("Bedrijfsindeling Kamers van Koophandel") classification code, a Dutch industry classification scheme which closely resembles the US-SIC-coding. Some three-digit BIK-industries are combined into one group in order to obtain a reasonable number of observations, as far as the combination can be economically justified. For this reason, for example the industry Air Transportation (BIK 620) is not combined with other industries, despite the fact that it contains only 5 firms. This grouping issue is more likely to occur in a relatively small economy, such as the Dutch economy, than in a relatively large economy, such as the US economy. As a deviation from Harris (1998), we do not only use single segment firms to estimate equation (6.1). The data do not allow us to isolate firms that report only one segment.<sup>21</sup> Instead, we use all firms within an industry in order to esti-

<sup>&</sup>lt;sup>20</sup> Since the procedure used by the database provider of providing annual report data for no longer than five years, this is the maximum period for which we can estimate the equation. This version of the database used dates from the beginning of 1997, which means that for some firms data up till 1996 were already available, whereas for others the year 1995 was not yet available. This relatively short period for a time-series analysis reduces the power of the test. In addition, the estimation procedure may introduce auto correlation and auto regression problems. For example, in case of significant positive auto correlation, the significance of the estimated coefficients may be overestimated.

<sup>&</sup>lt;sup>21</sup> Harris (1998) notices that by using only single-segment firms to predict equation (6.1), the power of the test may be reduced if single-segment firms differ from multi-segment firms in their ability to maintain competitive

mate the speed of profit adjustment, whereby the industry assignment criterion, provided by the database provider, is followed.<sup>22</sup>

In theory, both measures for the proprietary costs capture different aspects of competition within an industry. The concentration ratio reflects the competition for market share between large and small firms in an industry. A high concentration ratio implies that large firms dominate the industry and that the competitive behavior in such an industry is more likely to be collusive. However, it may well be possible that the competition between large firms in an industry is higher than the concentration ratio suggests. The competitive behavior is not solely determined by the degree of concentration in an industry. The second measure for the proprietary costs, the speed with which above-normal profits in an industry adjust to their normal values, tries to capture additional information on the competitive behavior in the industries. This second measure reflects the average ability of firms in a particular industry to earn above-normal profits, without differentiating between firm size. The higher the speed with which profits in an industry, the more competitive the industry is expected to be. By including both competition measures in the analysis, the speed of profit adjustment in an industry is roughly controlled for by the differences in size between firms in a particular industry.

The MS-model predicts that the likelihood of going public is smaller if both the threshold value and the proprietary costs are relatively high. In order to capture this interdependence between the different aspects of competition and the incidence of going public we introduce two dummy variables. One variable links the ratio of tangible to total assets to the profit adjustment measure, and the other links the tangible to total assets ratio to the four-firm concentration ratio. The indicator variables are coded 1, if the tangible to total assets ratio of an industry exceeds the average ratio of all industries in the sample, and the profit adjustment coefficient, respectively, the four firm concentration ratio of an industry is lower than the average for all industries. Otherwise, the indicator variables are coded 0.

advantages. By only using single-segment firms in estimating the speed of adjustment coefficient, Harris implicitly assumes that there are no differences in this respect between single- and multi-segment firms. Accordingly, in both cases the reliability of the test would increase if all firms that are active in a particular industry were used to estimate equation (6.1).

The going-public decision cannot only be seen as a result of the trade off of a firm's disclosure costs and benefits. Other theories exist that are concerned with the question why firms do or do not go public. We will deal with these competing theories; in particular those which provide an alternative explanation as to why firms opt for private financing.

A first concurrent explanation as to why not all firms finance publicly is that firms have to have a particular size in order to be considered for a listing. For a listing on the AEX, for example, firms should have a book value of equity capital of at least 10 million Dutch guilders. But even if this formal requirement is met, it is more likely for larger companies to go public, because of the fixed listing costs (such as underwriting fees, periodically recurrent stock exchange fees and fixed disclosure costs).<sup>23</sup> We will control for size by including the firms' total assets in the regression. Because this variable is highly skewed we use the natural logarithm of total assets in our analysis.

Information asymmetry between the company and investors may act as a listing barrier too. The less the investing public knows about a firm, the higher the discount on the price of the shares sold, since the informational asymmetry adversely affects the average quality of firms seeking a new listing (Leland and Pyle (1977) and Rock (1986)). These adverse selection costs are more likely to affect the listing decision of relatively small and young companies, which have little track record and low visibility (Chemmanur and Fulghieri, 1999). In order to control for this adverse selection argument, the age of firms (in addition to their size) is also included in the regression. Similar to the variable total assets we use the natural logarithm of age in our analysis.

Another factor that may influence the going-public decision is the phenomenon of a concentration of public offerings in certain periods. This "window of opportunity" argument, as it is called, suggests that there are certain periods in which stocks are mispriced, and that companies go public in order to exploit overvaluation (Ritter, 1991). Hence, one of the possible reasons as to why we will observe private firms is that these firms are simply awaiting a period in which stocks in general, or stocks of comparable public firms (for example firms

<sup>&</sup>lt;sup>22</sup> The REACH-database distinguishes main activities on two-digit level only. This means that if a firm has operations in two different three-digit BIK-industries within the same two-digit industry, its main activity cannot be assessed by the database. In such cases the lowest three-digit industry is chosen as the firm's main industry.

 $<sup>^{23}</sup>$  Ritter (1987) has estimated that in the US the fixed costs related to an IPO are about \$250,000, and the variable costs about 7% of the gross proceeds of the IPO.

from the same industry), are sufficiently overvalued. This implies that the shorter the period from which the sample firms are collected, the more the results will be dependent on the specific period chosen. The methodology followed in our analysis, more specifically, the long period from which the IPOs are collected and the fact that most variables are measured as an average over a period of five years, makes it unlikely that the results are influenced by the window of opportunity phenomenon.<sup>24</sup>

Firms may also be forced to go public as a result of private capital market constraints. For example, firms with many or large investment opportunities are more likely to seek outside financing, especially when they lack internal funds. The presence of investment opportunities is proxied for by the rate of a firm's growth in sales, and the lack of internal funds is measured by the firm's cash flow from operations scaled by total assets. Since the latter variable can be interpreted as a measure of performance too, we have to control for differences in risk between firms. We use the firm's debt ratio as a measure of (financial) risk.

Another concurrent explanation as to why firms might be reluctant to enter public capital markets is the fear of losing control. Although a loss of control is often mentioned as an important barrier to enter public capital markets, we expect its influence on IPOs, especially for the period we investigate, to be relatively low. First, the free float of Dutch listed firms in general and that of the IPO firms from the sample in particular is relatively low, so that a majority stake, by means of buying shares publicly, can hardly be obtained. Secondly, only until recently were Dutch firms allowed to adopt various takeover barriers, such as the issuing of preferred shares to befriended parties, the issuing of shares without voting rights, constraining the amount of votes to be cast to a maximum, and installing a special corporate governance structure, called the "structuur regime". This is why hostile take-over attempts very seldom occur in the Netherlands (Oosterhout, 1996). Still, some measures for control are included in our analysis. Both firms that are controlled by a family and firms with a majority shareholder or just a few large shareholders, will suffer more from losing control than other firms. Hence, these firms are more likely to stay private than non-family firms or firms with a

<sup>&</sup>lt;sup>24</sup> Pagano et al. (1998) measure the window of opportunity argument by looking at the (median) market-to-book ratio of public companies in a particular industry. High market-to-book ratios in an industry suggest overvaluation of the companies in that industry, making a public offering of those companies more likely. It turns out that the industry market-to-book ratio is the most significant determinant of the probability of listing (beside size) in their study. Market-to-book ratios may also assess a firm's growth opportunities. However, based on an

more dispersed ownership base. We will control for family interference and concentrated shareholdings by distinguishing family enterprises from non-family enterprises, and by looking at the number of block holders – i.e. shareholders with a stake of at least 5% – per firm. Finally, we will control for the presence of a venture capitalist, since we expect the likelihood of going public for firms that use venture capital to be higher than for other firms. Venture capitalists are known to prefer public capital markets, for these markets offer good exit opportunities. The measures for control of the potential and actual IPO firms are derived from the database and the IPO prospectuses, respectively.

### 6.4.2 The Model

Based on the above discussion, the following equation is used to estimate the probability of going public:

$$y_{ij} = \beta_0 + \beta_1 Tang_j + \beta_2 \alpha_{2j} + \beta_3 C4_j + \beta_4 Tang \& \alpha_{2j} + \beta_5 Tang \& C4_j + \beta_6 ln(TA_i) + \beta_2 CFO/TA_i + \beta_8 Debt_i + \beta_9 Growth_i + \beta_{10} BH_i + \beta_{11} VC_i + \beta_{12} Fam_i + \beta_{13} ln(Age_i) + \varepsilon_{ij}$$

$$(6.2)$$

where:

$\mathcal{Y}_{ij}$	=	1 provided that firm <i>i</i> from industry <i>j</i> has gone public in the period 1984-1995,
		otherwise 0;
Tangj	=	the average value of tangible fixed assets over total assets of industry <i>j</i> ;
$\alpha_{2j}$	=	the average value of the profit adjustment coefficient of industry <i>j</i> ;
$C4_j$	=	the average value of the four-firm concentration ratio of industry $j$ ;
$Tang\& \alpha_{2j}$	=	a dummy variable that is 1 if $Tang_j$ is greater than and the profit adjustment
		coefficient is lower than the average for industry <i>j</i> ;
Tang&C4 <sub>j</sub>	=	a dummy variable that is 1 if <i>Tang<sub>j</sub></i> is greater and the four-firm
		concentration ratio is lower than the average for industry $j$ .
$ln(TA_i)$	=	the natural logarithm of total assets of firm <i>i</i> ;
$CFO/TA_i$	=	cash flow from operations over total assets of firm <i>i</i> ;
Debt <sub>i</sub>	=	the debt ratio of firm <i>i</i> ;
$Growth_i$	=	the growth in net sales of firm <i>i</i> ;

ex-post analysis, Pagano et al. (1998) conclude that in the literature the mispricing argument is more appropriate for their sample of Italian firms, since investment and profitability decrease after IPOs.

$BH_i$	=	the number of shareholders with an interest in firm $i$ 's equity capital of at least
		5%;
$VC_i$	Ξ	a dummy variable that is 1 if firm <i>i</i> uses venture capital, otherwise 0;
$Fam_i$	=	a dummy variable that is 1 if firm <i>i</i> is a family enterprise, otherwise 0;
$ln(Age_i)$	=	the natural logarithm of firm <i>i</i> 's age.

### 6.5 Data and Descriptive Statistics

The main source of data used in this study is the REACH-A-database, which provides financial and other information about more than 8.000 of the most important Dutch companies.<sup>25,26</sup> The financial information in the REACH-database contains, besides several ratios, balance sheet and income statement figures of only the last five years. In order to provide the most recent company information, the REACH-database is periodically updated, i.e. every two to three months. For this study, we have used a version of the database dating from early 1997, which contains the financial information from 1991-1995 of most companies.

The research sample is drawn from companies that went public on the AEX between 1984 and 1995 and those that were in a position to go public, but did not do so in this period. The public companies are presented in Table 6.1 and consist of 95 firms. Nine of these concerned financial or related companies,<sup>27</sup> which are excluded from the sample because their operations and accounting information is difficult to compare with that of non-financial companies. Another 6 firms are excluded from the sample because they went bankrupt before the period from which the financial information was collected. Therefore, no sufficient information could be taken from the REACH-database, because it only provides information about the period of the last five years, which ends before the dating of the most recent update. Another 6 firms could not be included because of a merger, take-over, or buy-out during the period from which the data-set was collected. Finally, one company is excluded because no historical

<sup>&</sup>lt;sup>25</sup> REACH is an acronym for Review and Analysis of Companies in the Netherlands and is marketed by DEL-WEL Uitgeverij BV.

<sup>&</sup>lt;sup>26</sup> There is also a REACH-B-database that provides more limited information for about 450,000 Dutch companies.

<sup>&</sup>lt;sup>27</sup> More specifically, the firms that are assigned to the BIK-industry codes 65, 66, and 67, are excluded. The BIK-classification, a Dutch based industry classification, roughly follows the US-SIC-classification.

# Table 6.1: Introductions on the AEX<sup>1</sup> in the period 1984-1995

This table reports the Initial Public Offerings on the AEX between 1984-1995. Firms are classified according to the year of introduction. In the third column the type of introduction is stated. Three introduction types are distinguished: the issuing of new shares (E), the issuing of existing shares (H), and the introduction of already publicly traded shares (V). The last distinction concerns firms that were listed on the "Incourante Markt" (a minor informal stock market organized by a small number of financial companies) and which moved to the AEX. In this research, these introductions are defined as IPOs too, because the "Incourante Markt" imposes no additional formal disclosure requirements and the volume and liquidity of this minor exchange are much lower than for the formal AEX (see also Pagano et al., 1998).

Firm	Туре
Compudata Holding N.V. <sup>2</sup>	E + H
DOCdata N.V. <sup>2,3</sup>	E
Grolsche Bierbrouwerij N.V. <sup>2</sup>	Н
Phoenix Beheer N.V.	V
Pie Medical N.V. <sup>2</sup>	E + H
Polynorm N.V. <sup>2</sup>	Н
Text Lite Holding N.V. <sup>7</sup>	Н
Amsterdam Options Traders <sup>4</sup>	
Crown van Gelder Papierfabrieken N.V. <sup>2</sup>	Н
Datex Holding N.V. <sup>2,10</sup>	E + H
Furigas N.V. <sup>2,11</sup>	E + H
	E + H
	V
	Н
Minihouse Holding N.V. <sup>5,8</sup>	V
Sporthuis Centrum Recreatie N.V.	E + H
Thomassen & Drijver-Verblifa N.V.	Н
Ahrend Groep N.V.	E + H
	Н
Casolith Sheets N.V. <sup>2,9</sup>	E + H
	E + H
	E + H
De Drie Electronics Beheer N.V. <sup>2</sup>	E + H
	E + H
	Н
	Н
	E + H
HCS Technology N V <sup>7</sup>	E + H
	E + H
	E + H
Inter/View Europe N V <sup>2</sup>	E + H
	Н
	Compudata Holding N.V. <sup>2</sup> DOCdata N.V. <sup>2,3</sup> Grolsche Bierbrouwerij N.V. <sup>2</sup> Phoenix Beheer N.V. Pie Medical N.V. <sup>2</sup> Polynorm N.V. <sup>2</sup> Text Lite Holding N.V. <sup>7</sup> Amsterdam Options Traders <sup>4</sup> Crown van Gelder Papierfabrieken N.V. <sup>2</sup> Datex Holding N.V. <sup>2,10</sup> Furigas N.V. <sup>2,11</sup> Geveke Electronics International N.V. <sup>2</sup> Groothandelsgebouwen N.V. GTI Holding N.V. Minihouse Holding N.V. <sup>5,8</sup> Sporthuis Centrum Recreatie N.V.

<b>Table 6.1</b> – <i>c</i>		
	Kooijman Effectenkantoor N.V. <sup>4</sup>	
	Management Share N.V. <sup>2</sup>	Н
	Multi Function N.V. <sup>8</sup>	E + H
	Neways Electronics International N.V. <sup>2</sup>	E + H
	Orco Bank N.V. <sup>4</sup>	
	Rood Testhouse International N.V. <sup>2</sup>	Е
	Simac Techniek N.V. <sup>2</sup>	E + H
	Staal Bankiers N.V. <sup>4</sup>	
	Van der Moolen & Co. N.V. <sup>4</sup>	
	Vredestein N.V.	E + H
1987	Aalberts Industries N.V.	E + H
	Atag Holding N.V.	E + H
	De Nationale Investeringsbank N.V. <sup>4</sup>	
	De Boer Winkelbedrijven N.V.	Н
	Dico International N.V. <sup>2</sup>	H
	Gouda Vuurvast Holding N.V. <sup>2</sup>	E + H
	Homburg Holding N.V. <sup>2,7</sup>	Н
	Koninklijke Frans Maas N.V.	Ĥ
	Kühne + Heitz N.V. <sup>2</sup>	Н
	Nederlandse Participatie Maatschappij N.V. <sup>4</sup>	11
	Nedschroef Holding N.V. <sup>2</sup>	E + H
	Ordina Beheer N.V. <sup>2</sup>	E + H
	Van der Hoop Effectenbank N.V. <sup>4</sup>	
	Weveler N.V. <sup>2</sup>	Н
1988	LCI Computergroep Group N.V. <sup>2</sup>	E
	NKF Holding N.V.	V
	Van Besouw Holding N.V.	V
	Volmac Software Groep N.V.	H
1989	Air Holland N.V. <sup>7</sup>	Н
	DAF N.V. <sup>7</sup>	Н
	DSM N.V.	H
	Flexovit International N.V.	E + H
	Free Record Shop Holding N.V. <sup>2</sup>	E
	HCA Holding N.V. <sup>2</sup>	H
	Oldelft Groep N.V.	V
	Pirelli Tyre Holding N.V.	E
	PolyGram N.V.	E + H
	Sligro Beheer N.V. <sup>2</sup>	E + H
	2	
1990	Helvoet Holding N.V. <sup>2</sup>	Н
	Nedcon Groep N.V. <sup>2</sup>	E + H
	Newtron Holding N.V. <sup>2,12</sup>	E

	Randstad Holding N.V.	Н
1991	Draka Holding N.V.	E + H
	Vilenzo International N.V. <sup>2</sup>	Н
	Welna N.V.	V
992	Apothekers Coöperatie OPG U.A.	Н
	Artu Biologicals	V
	Fugro-McLelland N.V.	E + H
993	Heijmans N.V.	Н
994	Ballast Nedam N.V.	Н
	Ceteco Holding N.V.	E
	EVC International N.V.	E + H
	Koninklijke PTT Nederland N.V.	Η
	Smit Transformatoren N.V.	E+H
995	ASM Lithography Holding N.V.	E + H
	Axxicon Group N.V.	Η
	Baan Company N.V.	E + H
	BE Semiconductor Industries N.V. <sup>13</sup>	E
	CMG plc	E + H
	Gucci Group N.V.	$\mathbf{E} + \mathbf{H}$
	Heidemij N.V. <sup>6</sup>	V
	Vendex International N.V.	E + H

<sup>1</sup> See footnote 4 of Chapter 1.

<sup>2</sup> Introductions on the "Parallelmarkt" and not on the "Officiële Markt" (respectively, the formal minor and major stock exchange) of the AEX. The Parallelmarkt was established in 1982 to offer smaller firms the opportunity to attract public equity capital, too. In October 1993 the Parallelmarkt was abolished and the size requirements for entry on the Officiële Markt were changed so that all firms listed on the Parallelmarkt could enter the Officiële Markt, as they indeed did.

<sup>3</sup> DOCdata was withdrawn from the AEX in 1994 and came back in 1997. Because of this relatively short period of absence, DOCdata is not excluded from the sample.

<sup>4</sup> Financial company.

<sup>5</sup> Minihouse Holding was already listed on the OTC-Market of the London Stock Exchange before its introduction on the AEX.

<sup>6</sup> Heidemij was already listed on the NASDAQ before its introduction on the AEX.

<sup>7</sup> This firm went bankrupt in the period 1984-1995.

<sup>8</sup> Multi Function and Minihouse merged in 1986 into Multihouse.

<sup>9</sup> Casolith Sheets was taken over in the period 1984-1995.

<sup>10</sup> Datex Holding was taken over by Geveke Electronics International in the period 1984-1995.

<sup>11</sup> Furigas was withdrawn from the AEX by a management buy-out in the period 1984-1995.

<sup>12</sup> Newtron Holding (later known as Ordina Holding B.V.) was consolidated with Ordina Beheer in 1991.

<sup>13</sup> BE Semiconductor Industries N.V., a subsidiary of Berliner Elektro Holding A.G, was founded in May 1995 and comprises the Dutch companies Fico B.V. and Meco International B.V.. BE Semiconductor Industries N.V. is excluded from the sample because it has no historical data. Both Fico B.V. and Meco International B.V. are not included in the potential IPO sample.

<sup>14</sup> Dentex Groep N.V. was taken over in the period 1984-1995 and withdrawn from the AEX.

data were available. Thus, the final sample comprises 73 companies.<sup>28</sup> Eight of these companies did not initially offer their shares on the AEX, but on an informal much smaller stock market, the so-called "Incourante Markt". Since this market does not set formal disclosure requirements, such as the AEX, and because of its low volume and liquidity, we will define all new listings on the AEX as IPOs.<sup>29</sup>

The other part of the sample, the companies that were in a position to go public in the period of study, is drawn from a data-set offered by a Dutch CPA-company. By order of the AEX, in 1995 this CPA-company executed a research project on the characteristics of Dutch private companies that met the official listing requirements. The main listing requirements are: (i) a book value of shareholders equity in excess of 10 million Dutch guilders, (ii) a history of at least 5 years and (iii) positive earnings for at least 3 of the last 5 years.<sup>30</sup> These requirements date from October 1993, the time when the second tier market of the AEX, called the "Parallelmarkt", was abolished. From that date on, the listing requirements of the main stock market, called the "Officiële Markt", have been lowered to the aforementioned levels so all firms listed on the "Parallelmarkt" could enter the "Officiële Markt". Before October 1993, the book value of the shareholders equity had to exceed 50 million Dutch guilders in order to list on the first tier, and 5 million Dutch guilders for listing on the second tier stock market.

The original data-set of Dutch potential IPO firms contains 891 companies. Fifty-two of these companies have been excluded, because they are financial or related companies. This leaves a total of 839 non-financial companies. Another 42 companies have been excluded, because their annual figures were not available in the REACH-database.<sup>31</sup> Another five firms have

<sup>&</sup>lt;sup>28</sup> Because of the exclusion of bankruptcy and reorganized firms, a survivorship bias may occur in the analysis. However, all of the excluded firms are from different industries (measured at the 3-digit BIK-industry code – the industry level used in the analysis) except for Text Lite Holding NV, Furigas NV and Dentex Groep NV, which all have the industry code 65. This code is anyhow excluded from the analysis (see footnote 27). Hence, we do not expect our industry results to be significantly influenced by survivorship.

<sup>&</sup>lt;sup>29</sup> This procedure is similar to Pagano et al. (1998), who also only define initial offerings on the Milan Stock Exchange (the largest stock exchange in Italy) as IPOs.

<sup>&</sup>lt;sup>30</sup> The last two formal listing requirements are not applied very stringently. For example, firms that cannot meet the earnings requirement may still go public under somewhat more restrictive conditions; one of them has to do with a more stringent lock-up rule. In addition, firms younger than five years can go public if they have a history of being part of another firm. For example, BE Semiconductor Industries went public in December 1995, but was founded in May 1995 out of two older companies: Fico and Meco, only a couple of months earlier. For this reason the sample of potential IPO firms contains some firms that are younger than five years.

<sup>&</sup>lt;sup>31</sup> For 25 firms out of this group, very concise information is contained in the REACH-B-database, because these firms are too small to be part of the REACH-A-database. In the REACH-database size is based on the number of

been excluded because they can be considered as a subsidiary of another company from the overall sample, or as a subsidiary of a listed firm (which is not contained in the IPO sample). Finally, 6 companies have been excluded because they are classified as non-commercial enterprises.<sup>32</sup> Thus, the final sample of potential IPOs – i.e. companies that met the listing requirements of the AEX in 1995 – contains 786 companies.

Table 6.2 summarizes the industry estimates of competition for the 113 industries which are examined in our analysis. The proxy variable for capital intensity is estimated as the average of the tangible to total assets ratios for all firms in an industry, regardless of survivorship, with data ranging from 1990-1996. We pool data from several different years in order to prevent the results to be concentrated on one particular year.

Reported concentration ratios are estimated on the basis of annual sales figures from 1991-1995. Since for most firms the 1991-1995 sample data are available, concentration ratios for the years 1990 and 1996 are not used to derive the average concentration ratio. Concentration ratios are also measured regardless of survivorship. The variable speed of profit adjustment is estimated with pooled data for all the firms in an industry over the period 1990-1996. At the bottom of Table 6.2 summary statistics provide various proxies for competition. For all these measures the width between the minimum and the maximum value indicates that in the analysis a wide diversity in competitive environments has been captured. Of all the estimated coefficients that assess the speed of profit adjustment within an industry, 16 (of the 113) do not significantly differ from zero. Since larger values of  $\alpha_{zy}$  imply less competition within an industry, the insignificant coefficients suggest a high level of competition in these industries.

employees (more than 75 employees). The other firms are excluded because no annual report figures were available in the REACH-database.

<sup>&</sup>lt;sup>32</sup> These firms are classified in the BIK industry codes 800, 802, 804, 851, 911 and 913.

BIK	$N_j$	Description	Tangi	$C4_j$	$\alpha_{2j}$
011	39	Farming and Market Gardening	0.473	0.603	0.513 *
012	9	Breeding and Animals Keeping	0.309	0.915	0.466
050	6	Fishing Industry	0.481	0.995	0.636
111		Oil & Gas Drilling	0.566	0.987	0.933 *
112		Oil & Gas Drilling Services	0.298	0.897	0.644 *
142		Sand, Gravel and Clay Winning	0.439	0.948	-0.189
151,152		Meat and Fish Processing	0.384	0.830	1.079 *
153		Vegetables and Fruits Processing	0.411	0.766	0.905 *
154		Vegetable and Animal Oils and Fats	0.321	0.965	-0.119
155	28	Dairy Products	0.338	0.707	0.685 *
156	7	Grain Products	0.459	0.936	0.605 *
157	25	Animal Feed	0.287	0.633	0.689 *
158	115	Miscellaneous Foods	0.477	0.574	0.963 *
159		Beverages	0.465	0.825	0.569 *
160	11	Tobacco	0.177	0.916	0.820 *
171-173	22	Textile Weaving	0.445	0.864	0.597 *
174	24	Textile Products	0.369	0.743	0.838 *
175,177	36	Miscellaneous Textile Products	0.307	0.603	0.932 *
181,182	45	Clothing	0.228	0.490	0.888 *
201-205	61	Wood Working	0.303	0.415	0.579 *
211	22	Pulp, Paper and Cardboard Manufacture	0.539	0.790	0.969 *
212	70	Paper and Cardboard Products	0.396	0.753	0.976 *
221	78	Publishing	0.299	0.718	0.946 *
222,223	83	Printing	0.475	0.468	0.977 *
231,232	12	Coke Products and Oil Processing	0.405	0.970	0.715 *
241	64		0.373	0.859	0.750 *
242	12	Agricultural Chemicals	0.319	0.767	0.170
243	28	Paints, Varnishes, Ink & Mastic	0.296	0.495	0.530 *
244	41	Pharmaceutical Products	0.324	0.700	0.816 *
245	20	Cleaning & Maintenance Products, Cosmetics	0.318	0.735	1.048 *
246	57	Miscellaneous Chemicals	0.339	0.616	0.741 *
251	18	Rubber Products	0.379	0.939	0.691 *
252	92	Plastic Products	0.433	0.600	0.810 *
261	23	Glass Products	0.408	0.638	1.228 *
262,263		Ceramic Products	0.406	0.853	0.952 *
264	10	Baked Clay Products for the Building Industry	0.534	0.881	1.010 *
265,268	16	Miscellaneous Mineral Products	0.465	0.719	0.783 *
266	45		0.414	0.384	0.806 *
271-273	20		0.400	0.948	0.576 *
274		Non-ferro Metals	0.320	0.653	0.827 *
275	13	Smelting	0.460	0.782	1.296 *
281		Metal Constructions, Windows & Doors	0.321	0.493	0.788 *
282,283	37	Tanks, Kettles & Radiators	0.327	0.644	0.855 *
284	16	Forging, Pressing & Thumping	0.444	0.711	0.220

Table 6.2: Industry descriptions and variables

285	28	continued Metal Processing	0.461	0.758	0.758
286	23	Metal Tools	0.294	0.775	0.936
287	69	Miscellaneous Metal Products	0.351	0.614	0.953
291	62	Mechanical Energy Machinery	0.249	0.555	0.604
292	114		0.255	0.564	0.888
293	21	Agricultural Machinery	0.264	0.795	0.846
294	25	Instruments Machinery	0.256	0.746	0.558
295,296	128	Special Industry Machinery	0.269	0.626	0.769
297	9	Household Appliances	0.274	0.963	0.732
300	18	Computer & Office Equipment	0.167	0.803	0.216
310,311	15	Electric Motors & Generators	0.277	0.925	0.651
312	17	Switch Design	0.258	0.806	0.463
313	9	Soldered Wire	0.328	0.931	0.970
314,315	16	Electrical Machinery & Batteries	0.272	0.997	0.940
316	13	Electronic Components	0.272	0.866	0.444
322	11	Transmitting Equipment	0.208	0.983	0.389
331	21	Surgical & Medical Equipment	0.200	0.756	0.974
341,342	38	Motor Vehicles	0.312	0.927	0.746
343	23	Motor Vehicle Parts & Supplies	0.324	0.664	0.963
351	54	Shipbuilding & Repair	0.251	0.478	0.511
353-355	11	Aircraft, Space & Other Vehicles	0.238	0.907	0.756
361	62	Furniture	0.332	0.453	0.917
400	64	Public Electrical and Gas Utilities	0.728	0.372	0.894
410	22	Public Water Utilities	0.892	0.423	1.079
451	39	Preparing for Building	0.311	0.712	0.275
452	562	Building Industry	0.257	0.254	0.680
453	166	Building Machinery	0.224	0.425	0.748
501,502	188	Motor Vehicles – Wholesale and Repair	0.328	0.332	0.825
503-505	29	Motor Vehicles Parts & Supplies - Wholesale	0.241	0.655	0.859
511	27	Business Intermediation	0.209	0.947	0.471
512	154	Agricultural Equipment - Wholesale	0.220	0.346	0.671
513	254	Groceries – Wholesale	0.242	0.564	0.706
514	324	Miscellaneous Consumer Goods - Wholesale	0.205	0.405	0.858
515	289	Intermediary Goods – Wholesale	0.207	0.406	0.813
516	286	Machinery & Equipment - Wholesale	0.170	0.340	0.759
517	43	Miscellaneous – Wholesale	0.188	0.475	0.788
521	67	Non-specialized Retail Trade	0.532	0.808	0.483
522	14	Grocery Stores	0.400	0.835	0.685
524	184	Variety Stores	0.369	0.530	0.758
551,552	56	Recreational Accommodation	0.761	0.671	0.970
553-555	37	Eating & Drinking Places	0.536	0.518	0.696
601-603	268	Transportation	0.566	0.592	0.850
611	41	Seagoing	0.480	0.521	0.974
612	14	Inland Shipping	0.510	0.821	0.909
620	5	Transportation by Air	0.695	0.997	0.685

Table	e o.2 –	continuea			
631	48	Loading, Unloading, Transfer & Storage	0.540	0.640	0.681 *
632	21	Miscellaneous Transportation Services	0.526	0.770	1.058 *
633	331	Traveling Agencies	0.188	0.518	0.828 *
634	53	Shipping & Loading	0.371	0.479	0.652 *
641	7	Postal Services	0.341	0.999	0.694 *
642	14	Telecommunication	0.300	0.930	0.498
700,701	62	Real Estate Development and Trade	0.384	0.433	0.763 *
702	29	Real Estate – Rental	0.583	0.746	0.798 *
711,712	20	Transportation Vehicles - Rental	0.711	0.671	0.430
713	11	Machinery & Equipment - Rental	0.406	0.859	1.283
714	11	Miscellaneous Goods - Rental	0.535	0.861	1.063 *
721-726	97	Computerization Services	0.173	0.498	0.925 *
731	11	Research & Development	0.464	0.967	0.556 *
741	223	Lawyers, Accountants and Tax Consultants	0.307	0.456	0.906 *
742	108	Architectural & Engineering Agencies	0.219	0.366	0.749 *
743	10	Inspection	0.360	0.906	0.589
744	30	Advertising Agencies	0.279	0.653	0.766 *
745	33	Temporary Employment Agencies	0.155	0.780	0.962 *
746	19	Security & Tracing	0.264	0.853	0.834 *
748	35	Miscellaneous Commercial Services	0.402	0.559	1.250 *
900	33	Environmental Services	0.553	0.429	0.904 *
921,922	23	Film, Radio & Television	0.380	0.784	1.149 *
923-927	18	Miscellaneous Recreation	0.710	0.840	0.959 *
930	24	Miscellaneous Services	0.604	0.525	0.266
113	6771	Minimum	0.155	0.254	-0.189
		Maximum	0.892	0.999	1.296
		Mean	0.373	0.700	0.757
		Median	0.338	0.719	0.783
	1 10	1 0 07			

Table 6.2 - continued

\* Indicates significantly > 0 at  $\alpha$  < .05.

 $N_j$  is the number of firms used to estimate  $Tang_j$ ,  $\alpha_{2j}$  and  $C4_j$  for each industry j.

 $Tang_j$  is the average ratio of tangible assets over total assets for industry *j* estimated based on data over the period 1990-1996.

 $C4_j$  is the four-firm concentration ratio for industry *j*, estimated with average sales figures over the period 1991-1995.

 $\alpha_{2j}$  is the persistence of ROA above the industry mean, estimated as  $\alpha_{2j}$  in the following regression equation with data over the period 1990-1996:

 $X_{ijt} = \alpha_{0j} + \alpha_{1j} (X_{ijt-1}D_n) + \alpha_{2j} (X_{ijt-1}D_p) + \varepsilon_{ijt}$ 

where  $X_{ijt}$  is the difference between firm *i*'s ROA and the mean ROA for its industry, *j*, in year *t*;  $D_n$  is a dummy variable that is 1 if  $X_{ijt}$  is less than or equal to zero, otherwise 0; similarly  $D_p$  is 1 if  $X_{ijt}$  is greater than zero, otherwise 0.

	Tangj	$C4_j$	$\alpha_{2j}$	
Tang <sub>j</sub>	1.000			
$C4_j$	.551*	1.000		
	(.000)			
$\alpha_{2j}$	.227*	.166*	1.000	
2	(.000)	(.000)		

#### Table 6.3: Rank correlations between the measures for competition

This table shows the Pearson correlation coefficients between the measures for product market competition that are used in this study. Significance levels for the test indicating that the correlation coefficients are equal to zero are stated in parentheses. \* signifies that the correlation is significant at the .01 level (two-tailed).

The relations between the competition measures are reported in Table 6.3. The measures which proxy for the competition between firms in an industry – i.e. the for-firm concentration ratio ( $C4_j$ ) and the profit adjustment coefficient ( $\alpha_{2j}$ ) – show a low but significant correlation (rank correlation .166, significant at .01).<sup>33</sup> Similarly, the ratio tangible to total assets ( $Tang_j$ ) and  $\alpha_{2j}$  show a significant but acceptable (i.e. lower than 0.3) correlation. More serious is the correlation between  $Tang_j$  and  $C4_j$  (rank correlation .551, significant at .01). We will perform some robustness tests in Section 6.7 to find out to what extent the correlation between these two competition variables influences our results.

As documented by prior studies, our findings do not support a positive relation between concentration and profitability (Bain (1956), Brozen (1971a, 1971b) and Demsetz (1973, 1974)). Based on averages over the period 1991-1995, we find that a firm's profits are on the whole not related to the four-firm concentration ratio of its industry. The rank correlations between the four-firm concentration ratio and the performance measures  $ROA_i$  and  $CFO/TA_i$  (cash flow from operations over total assets) do both not significantly differ from zero (the respective rank correlations are -.029 (significant at .392) and -.046 (significant at .211)). The rank correlation between  $ROCE_i$  (return on capital employed) and the four-firm concentration ratio is significantly negative (rank correlation -.107, significant at .002).

<sup>&</sup>lt;sup>33</sup> Harris (1998) finds for her sample of listed American firms a rank correlation between  $C4_j$  and  $\alpha_{2j}$  of -.06 (significant at .60).

### Table 6.4: Summary statistics for IPO firms and potential IPO firms

In Panel A, the summary statistics refer to the whole sample, in Panel B to the firms that went public between 1984 and 1995, and in Panel C to potential IPO firms. The measures for competition in industry j, Tangi, Sexpi (sales expenses), R&Di (capitalized R&D expenses), C4i and  $\alpha_{2i}$ , are estimated with pooled data from 1990-1996. All tabulated financial variables are average numbers based on the figures from at most five annual reports, which are the annual reports of 1991-1995 for most firms from the sample. The IPO sample contains 73 and the potential IPO sample 786 companies.  $ROA_i$  is defined as gross profit over total assets, CFO/TA<sub>i</sub> as cash flow from operations over total assets and ROCE<sub>i</sub> as net profit before taxes plus paid interest divided by total assets minus short-term debt of firm i. The calculation of the variable CFO is shown in Appendix 6.A.  $Debt_i$  is defined as firm i's debt ratio, Growth<sub>i</sub> as firm i's growth in sales and  $Age_i$  as firm i's age in 1995. Values for  $ROA_i$ ,  $CFO/TA_i$ ,  $ROCE_i$ and Growth<sub>i</sub> are truncated at 100%. For each of the variables  $Debt_i$ ,  $Growth_i$ ,  $ROA_i$  and  $R\&D_i$ one case has been excluded because it is more than four standard deviations away from the mean.  $BH_i$  measures the number of firm i's block holders, a block holder being defined as an external shareholder with a stake of at least 5%.  $Fam_i$  is 1 if firm i can be characterized as a family enterprise, otherwise 0. A firm is defined as a family enterprise if the firm's name is a proper name or the majority stakeholder of the firm has a proper name.  $VC_i$  is 1 if a venture capitalist has a stake in the equity capital of firm i, otherwise 0. The ownership and control measures for the IPO firms are based on data from the prospectuses. <sup>1</sup>, <sup>2</sup>, <sup>3</sup> signify that the means respectively the medians of the IPO firms and non-IPO firms of the given variable are significantly different at the 1%, 5% and 10% levels, respectively (two tailed). The t-tests are corrected for Levene's test for equality of variances at a 95% confidence level.

Variable	Mean	Median	Std Dev.	Min.	Max.	Obs.
Tang <sub>j</sub>	.37	.33	.16	.16	.89	859
Sexp <sub>j</sub>	.13	.12	.10	0	.51	859
$R\&D_i$	.011	.006	.016	0	.14	859
$C4_j$	.64	.63	.23	.24	.99	859
$\alpha_{2i}$	.80	.81	.18	19	1.30	859
Sales <sub>i</sub> (million guilder)	486.9	131.9	1,602.9	6.8	22,019	741
$TA_i$ (million guilder)	364.0	67.8	1,724.5	3.6	31,867.5	859
$ROA_i$ (%)	9.4	8.1	8.6	-13.7	100	857
$CFO/TA_i$ (%)	24.7	22.1	19.3	-42.8	100	742
$ROCE_i$ (%)	18.7	15.5	15.1	-19.6	100	813
Debt <sub>i</sub>	.57	.58	.18	.12	1.3	767
$Growth_i$ (%)	7.7	5.4	13.2	-62.2	100	735
Agei	39.9	25	40.6	1	381	859
<i>Ext. Large Shareholder</i> <sub>i</sub> (%)	21.6	0	41.2	0	100	843
BH <sub>i</sub>	0.67	0	1.2	0	9	843
Total interest $BH_i$ (%)	28.8	0	42.9	0	100	840
$Fam_i$ (%)	35.5	0	47.8	0	100	851
$VC_i$ (%)	8.8	0	28.4	0	100	849
Government <sub>i</sub> (%)	5.4	0	22.6	0	100	854

Panel A: The Whole Sample

Variable	Mean	Median	Std Dev.	Min.	Max.	Obs.
Tang <sub>i</sub>	.32	.31	.13	.16	.76	73
Sexp <sub>i</sub>	.15	.13	.09	0	.38	73
$R\&D_i$	.012	.007	.016	0	.100	73
$C4_i$	.66	.70	.21	.24	.99	73
$\alpha_{2i}$	.81	.82	.15	.22	1.06	73
Sales <sub>i</sub> (million guilder)	$1,169.3^2$	293.5 <sup>1</sup>	2,676.8	6.8	16,671.4	73
$TA_i$ (million guilder)	$1,045.4^{3}$	$191.8^{1}$	3,476.2	5.8	26,836.8	73
$ROA_i$ (%)	9.2	8.4	7.4	-12.2	41	73
$CFO/TA_i$ (%)	28.3	24.4	20.7	-16.2	80.4	73
$ROCE_i$ (%)	19.0	17.3	15.6	-19.6	77.3	71
Debt <sub>i</sub>	.55	.54	.16	.16	1.07	65
$Growth_i$ (%)	9.9	$7.9^{2}$	15.9	-31.4	72.6	73
Agei	49.7	27	55.7	5	381	73
Ext. Large Shareholder <sub>i</sub> (%)	30.5	$0^{3}$	46.4	0	100	59
BHi	$1.8^{1}$	$1^{1}$	2.1	0	9	60
Total interest $BH_i$ (%)	$45.7^{1}$	$44.7^{1}$	42.7	0	100	55
$Fam_i$ (%)	$20.6^{1}$	$0^{1}$	40.7	0	100	68
$VC_i$ (%)	35.8 <sup>1</sup>	$0^{1}$	24.6	0	100	67
$Government_i$ (%)	5.9	0	23.7	0	100	68

# Panel B: The IPO Sample

# Panel C: The potential-IPO Sample

Variable	Mean	Median	Std Dev.	Min.	Max.	Obs.
Tang <sub>i</sub>	.37	.33	.16	.16	.89	786
Sexp <sub>j</sub>	.13	.12	.10	0	.51	786
$R\&D_i$	0.009	0.006	0.016	0	.141	786
$C4_i$	.63	.60	.23	.24	.99	786
$\alpha_{2i}$	.80	.81	.18	19	1.3	786
Sales <sub>i</sub> (million guilder)	$412.3^{2}$	$128.1^{1}$	1,421.4	9.3	22,019	668
$TA_i$ (million guilder)	$300.7^{3}$	65.6 <sup>1</sup>	1,447.4	3.6	31,867.5	786
$ROA_i$ (%)	9.4	8.0	8.8	-13.7	100	784
$CFO/TA_i$ (%)	24.3	21.9	19.2	-42.8	100	669
$ROCE_i$ (%)	18.7	15.4	15.0	-19.4	100	742
Debt <sub>i</sub>	.57	.58	.18	.12	1.3	702
$Growth_i$ (%)	7.5	$5.3^{2}$	12.9	-62.2	100	662
Agei	39.0	25	38.8	1	317	786
Ext. Large Shareholder <sub>i</sub> (%)	20.9	$0^{3}$	40.7	0	100	784
BHi	$0.58^{1}$	$0^1$	1.1	0	8	783
Total interest $BH_i$ (%)	$27.6^{1}$	$0^{1}$	42.7	0	10	785
$Fam_i$ (%)	36.8 <sup>1</sup>	$0^{1}$	48.3	0	100	783
$VC_{i}$ (%)	$6.5^{1}$	$0^1$	24.7	0	100	782
$Government_i$ (%)	5.3	0	22.5	0	100	786

In Table 6.4, Panel A, summary statistics are given of the entire sample. The competitive environment for the median firm in the sample can be described as follows. The median firm competes in an industry where 33% of the total assets is invested in tangible assets. Sales expenses capture 12% of total assets, and capitalized R&D expenses make out 0.6% of the total assets. The concentration ratio of the median firm's industry is 0.63, and the measure for the speed with which above-normal profits are reduced to their normal value is 0.81. The median firm of the firms that went public or were in a position to go public between 1984-1995, has 131.9 million guilders in sales, total assets of 67.8 million guilders, a return on total assets of 8.1%, a debt ratio of 0.58, a growth in sales of 5.4%, and is 25 years of age. With regard to the ownership structure and control, it appears that of all the firms in the sample about 22% have an external majority shareholder,<sup>34</sup> and on average about .7 block holders,<sup>35</sup> which are holding together a stake of about 29%. Furthermore, about 36% of the sample firms can be perceived as family enterprises,<sup>36</sup> about 9% has a venture capitalist as a shareholder<sup>37</sup> and about 5% is controlled by the national or a regional government.<sup>38</sup>

In Panel B and Panel C of Table 6.4, the summary statistics are given for the IPO firms and the potential IPO firms, respectively. The median IPO firm competes in an industry that is characterized by an investment rate of 31% and 0.7% for tangible assets, and R&D expenses relative to total assets, respectively. The sales expenses of the industry in which the median firm operates constitute 13% of the total assets. The concentration ratio is 0.7 and the measure for the speed of profit adjustment 0.82. The median IPO firm is more than twice as large as the median potential IPO firm measured in total sales, and almost three times as large measured in total assets. The median IPO firm is slightly more profitable than the median potential IPO firm; all three profitability measures are higher, although not significantly higher at the usual level. The median potential IPO firm is more levered than the IPO firm, although the difference is not statistically significant. The growth rate in total sales is higher for the median

<sup>&</sup>lt;sup>34</sup> An external shareholder is defined as a shareholder with a name different from that of the company's name or the name(s) of its director(s).

<sup>&</sup>lt;sup>35</sup> Block holders are defined as external shareholders with a stake of 5% or more.

<sup>&</sup>lt;sup>36</sup> A family enterprise is defined as a company with a proper name in the company's name or as a company with a majority stakeholder with a proper name.

<sup>&</sup>lt;sup>37</sup> The presence of a venture capitalist is determined if it is mentioned as a shareholder, disregarding the stake of its interest.

<sup>&</sup>lt;sup>38</sup> A firm is defined as a governmental institution if a national or regional government is mentioned as a majority shareholder.

IPO firm as for the potential IPO firm; in fact it is almost twice as high. Finally, the univarite analysis shows that the median IPO firm is not significantly older than the potential IPO firm.

With regard to ownership structure and control, the following differences between IPOs and potential IPOs have been found. The presence of an external shareholder with a majority stake in the company is more likely for IPOs than for potential IPOs: 31% of the IPOs and 21% of the potential IPOs have such a controlling shareholder, although this difference is not significant. However, the number of block holders is significantly higher for IPO firms: the average IPO firm has three times as many block holders as the potential IPO company. In addition, the total interest in the shares of the company of all block holders is higher for IPOs: 46% versus 28%. Furthermore, about 21% of all IPOs from the sample are family enterprises, whereas more than 36% of the potential IPOs have a family connection. The presence of a venture capitalist is more likely for IPO companies than for potential IPO companies: 36% of the IPOs had a venture capitalist as shareholder in the year they went public, whereas only 7% of the potential IPOs has such a stakeholder. This finding emphasizes the importance of the public capital market as an exit opportunity for venture capitalists. Finally, the interference of the Dutch government on a national or regional level is the same for both firm types.

### 6.6 Results

This section will report evidence on the question whether and how the competitive environment of firms that entered the AEX in the period 1984-1995, differs from those that were in a position to enter, but did not do so in this period. Table 6.5 shows the results of the estimate of the multivariate logistic regression expressed in equation (6.2) of variables that are hypothesized to influence the probability of a firm voluntarily surrendering to a more hostile disclosure environment by going public. A joint-test showing that all coefficients are zero has been rejected by the likelihood-ratio-test at a level lower than .0001.

With respect to a firm's competitive environment the results in Table 6.5 show that firms from capital-intense industries, measured by the average ratio of tangible over total assets in an industry, are less likely to go public than firms from less capital-intense industries. This result is consistent with the MS model, which predicts that high threshold values – which are associated with high entry barriers – increase the possibility of withholding proprietary

Table 6.5: Estimation of the relation between IPOs and product market competition This table presents the results of equation (6.2) below. The dependent variable  $v_i$  is coded 1 if the sample firm went public between 1984 and 1995, otherwise 0. Tang<sub>i</sub>,  $\alpha_{2i}$  and  $C4_i$  are the average ratio of tangible to total assets, profit adjustment coefficient and four-firm concentration ratio for industry j, respectively. Tang/ $\alpha_{2i}$  and Tang/ $C4_i$  are dummy variables that are 1 if Tang<sub>i</sub> is greater than and  $\alpha_{2i}$  is lower than the average for all industries j, or if C4<sub>i</sub> is lower than the average for all industries *j*, respectively, otherwise 0. All competition indicator variables are estimated based on average values of at most five contiguous annual figures between 1990 and 1996 as far as provided by the REACH-database.  $ln(TA_i)$  is the natural logarithm of total assets,  $CFO/TA_i$  the cash flow from operations over total assets,  $Debt_i$  the debt ratio and  $Growth_i$  the growth in sales of firm *i*. All these estimates are average numbers based on no more than the last five annual reports, for as far as the REACH-database provides these data.  $BH_i$  is the number of shareholders with a stake of at least 5% in the equity capital of firm i, and  $VC_i$  and  $Fam_i$  are dummy variables taking on the value 1 if a venture capitalist has a stake in firm *i*'s equity capital, respectively if firm *i* is a family enterprise. The latter variables are estimated from data provided by REACH (the potential IPO firms) and the prospectus (the IPO firms). In(Age<sub>i</sub>) is the natural logarithm of firm i's age in 1995. \*\*\*, \*\*, \* signify that the coefficients are significantly different from zero at the 1%, 5% and 10% level, respectively. The joint-test which indicates that all coefficients are zero is rejected by the likelihood ratio test at the 0.0001 level.

Variable	Estimate	Wald-statistic
Intercept	-10.06	23.10***
Competition indicators		
Tangi	-5.66	10.22***
$\alpha_{2i}$	1.29	1.26
$C4_i$	-0.62	0.44
$Tang\&\alpha_{2i}$	1.92	10.15***
$Tang\&C4_i$	-2.57	4.91**
Control variables		
$TA_i$	0.53	18.68***
$CFO/TA_i$	2.20	6.91***
Debti	-1.10	1.05
Growthi	0.02	4.02**
$BH_i$	0.35	10.27***
$VC_i$	0.98	4.65**
$Fam_i$	-0.51	1.43
$Age_i$	0.28	2.61*
Observations = 859		
Missing data = $205$		
Goodness of fit = $940.2$		
Likelihood ratio $\chi^2 = 101.3$		
Nagelkerke $R^2 = 0.33$		

$y_{ij} = \beta_0 + \beta_1 Tang_j + \beta_2 \alpha_{2j} + \beta_3 C4_j + \beta_4 Tang \& \alpha_{2j} + \beta_5 Tang \& C4_j + \beta_6 ln(TA_i) + \beta_6 $	(6.2)	
$\beta_7 CFO / TA_i + \beta_8 Debt_i + \beta_9 Growth_i + \beta_{10} BH_i + \beta_{11} VC_i + \beta_{12} Fam_i + \beta_{13} ln(Age_i) + \varepsilon_{ii}$	(6.2)	

information by means of staying private and, thus, will result in an increased likelihood of private financing.

However, according to the MS model it is not only the threshold value that determines the financing decision. The magnitude of the proprietary costs which can be imposed on the firm is of importance too. Compared to the capital intensity measure, the measures for concentration and the speed of profit adjustment in an industry are in themselves insignificant covariates. However, if these proxies for the height of the proprietary costs are directly combined with the measure for capital intensity, we find some interesting results. If competitorrelated proprietary costs are negatively related to the concentration within an industry, our findings are in agreement with the MS model. In accordance with this model, we find that firms from industries with an above-average capital intensity and a below-average concentration ratio are less likely to go public.<sup>39</sup> However, if the proxy for the speed of profit adjustment in an industry is directly combined with the measure for capital intensity, our results point at a different direction. The regression results show an increase in the likelihood of going public, when a firm's main industry shows an above-average ratio of tangible over total assets and the speed of profit adjustment is above-average. If competitor-related proprietary costs are positively related to the speed of profit adjustment in an industry,<sup>40</sup> the regression results contradict the MS model. This finding implies that firms from an industry with a low persistence of abnormally high profits - i.e. a high speed of profit adjustment together with a high degree of capital intensity are more likely to go public.<sup>41,42</sup>

The second hypothesis tested in this study is concerned with the prediction from the MS model that privately financed firms that are in a position to go public have more valuable

<sup>&</sup>lt;sup>39</sup> Similar results (not reported) are found when data from 1993 only (the midyear of the research period) are used in order to estimate the four-firm concentration ratio and the ratio of tangible assets over total assets.

<sup>&</sup>lt;sup>40</sup> Note that the lower the variable which measures the speed of profit adjustment in an industry ( $\alpha_{2j}$ ), the higher the speed with which above-normal profits return to their normal level.

<sup>&</sup>lt;sup>41</sup> Because a considerable number of cases has been excluded from the regression model presented in Table 6.5, we have used a reduced form of this model, including all firms from the sample, in order to check up on the validity of the results of the competition variables. When using a model that includes the competition variables and size only, we find similar results (not reported).

<sup>&</sup>lt;sup>42</sup> To the extent in which the ratio of tangible over total assets is related to the financing needs of firms, this result is not surprising. This is because firms in capital intense industries that generate little free cash flows are likely to have a high demand for outside capital. However, a high ratio of tangible over total assets need not unambiguously be a proxy for a high financing need. Another important issue is the growth in the number of firm activities over time. We control for this effect by including the firm's growth in sales in the estimation model.

proprietary information at their disposal than IPO firms. If the quality of proprietary information is positively related to profitability, private firms are expected to report higher profits than public firms. Our findings, however, are not in agreement with this prediction. Based on the univariate analysis reported in Table 6.4, we do not conclude that non-IPO firms are more profitable than IPO firms. Both average and median values for the three measures of profitability,  $ROA_i$ ,  $ROCE_i$  and  $CFO/TA_i$ , do not significantly differ from each other for both firmgroups. Although the reported differences are statistically not significant, they do indicate that if there is one group which outperforms the other, it is that of the IPO firms; a conclusion which is inconsistent with the hypothesis. The multivariate analysis confirms this suggestion. The significant positive coefficient for  $CFO/TA_i$  indicates that, on average, IPO firms are more profitable than non-IPO firms.<sup>43</sup>

After controlling for size, capital constraints, and ownership structure, all these results hold good. Based on previous empirical research on voluntary disclosure, it can be claimed that IPO firms are on average larger than potential IPO firms. This finding corresponds with the existence of economies of scale with offering public equity capital. Consequently, if public capital is cheaper than private capital (the general case), it can be concluded that, according to the MS model, the larger the issue, the higher the absolute public capital cost advantage and the lower the likelihood of a private offering. The estimated positive coefficient for size is also consistent with the expectation that adverse selection costs are higher for smaller firms, which makes a public offering less attractive. Adverse selection costs are also expected to be higher for younger firms. The positive coefficient for age is consistent with this prediction, although it is only significant at the 10% level.

The influence of capital constraints on the decision to go public is controlled for by the variables "cash flow from operations over total assets" and "growth in sales". The empirical evidence shows a significant difference in performance between IPO firms and non-IPO firms from the sample. During the period of research, IPO firms outperformed non-IPO firms on the basis of cash flow from operations relative to total assets.<sup>44,45</sup> Hence, it appears that the IPO

<sup>&</sup>lt;sup>43</sup> This result could be inflated by a survivorship-bias, because firms from the IPO-sample that went bankrupt before 1991 or experienced a merger, take-over or buy-out were excluded. However, such firms are neither included in the potential IPO-sample.

<sup>&</sup>lt;sup>44</sup> See also footnote 43.

<sup>&</sup>lt;sup>45</sup> The alternative performance measures *ROA* and *ROCE* do not show a significant difference in performance between IPO firms and non-IPO firms in a multi-variable logistic regression.

firms from the sample did not enter the public capital market due to a lack of internal capital. This result holds after controlling for risk by the firm's debt ratio.

With respect to the debt ratio the empirical evidence shows no significant difference between IPO firms and non-IPO firms. However, a difference in the average debt ratio for both firmgroups may be expected, since firms that go public mostly enlarge their relative stake of equity capital. The insignificant difference between the debt ratios of both firm-groups indicates that IPO firms rebalance their accounts after a period of high investment and growth and/or use the newly raised equity capital as collateral for raising debt (perhaps at now more concurrent rates). This finding corresponds with those reported in other European countries. Pagano et al. (1998) find evidence that indicates that in Italy firms go public to rebalance their accounts after a period of high investment and growth, rather than to finance subsequent investment and growth. Similar results are found for Spain (Planell, 1995) and Sweden (Rydqvist and Högholm, 1995).<sup>46</sup> However, this suggestion should be interpreted with caution, because our empirical results are based on financial data from the period 1991-1995. This reduces the reliability of an ex-ante test of factors influencing an IPO. For example, the results of firms that went public before 1991 are all based on performances after the offering took place. The other measure for capital constraints, growth in sales, appears to significantly increase the likelihood of going public, although the estimated coefficient is close to zero (.02). This finding indicates that growth firms on average prefer to finance their growth with public equity capital.47

Finally, our analysis shows some interesting results with respect to ownership structure. As expected, the presence of a venture capitalist positively influences the likelihood of going

<sup>&</sup>lt;sup>46</sup> These findings are in contrast to the US where newly listed companies experience excessive growth (Mikkelson, Partch and Shah, 1995). This apparent difference between US and European firms may reflect the greater maturity of European IPOs. Rydqvist and Högholm (1995) find the average age of firms going public in Continental Europe to be 40 years. For our sample of IPO firms the average age is 50 years, although this figure overestimates the real age of Dutch IPO firms, because of the research design used in our study. In contrast, in the US many startup companies go public to finance their expansion (Pagano et al., 1998).

<sup>&</sup>lt;sup>47</sup> A refinement could be made regarding the relation between growth, cash-flow from operations and going public. It is not just growth or the (relative) lack of internally generated funds that force a firm to seek for outside financing, it is more likely that both factors combined determine the need for outside capital. Firms that face a large number of growth opportunities, but at the same time generate sufficient internal funds, are less likely to enter public equity capital markets than firms that grow at a similar rate, while facing a shortage of internally generated cash. The same argument is true with regard to firms with (relatively) low cash flows from operations, but with different growth scenarios. We have tested this possible interaction by including the product of growth in sales and cash flow from operations in the regression model. The results of the interaction term (which are not reported), however, do not support the aforementioned relationship.

public. The number of external shareholders with a substantial interest ( $\geq$  5%) in the firm's equity capital also positively influences the likelihood of going public. This result does not correspond with the expectation that firms with a more concentrated shareholder basis are more likely to stay private. This result, though, should be interpreted with caution. As opposed to public firms, private firms are not required by the Dutch law to publicly disclose substantial equity holdings in their own firm and, therefore, it is quite possible that this result has been caused by this data restriction.<sup>48</sup> Finally, our results show that being a family enterprise does not significantly influence the likelihood of going public. This implies that family enterprises are not more likely to stay private.

#### 6.7 Robustness tests

In order to check the robustness of the results of the competition variables we have performed some additional tests. First, the high rank correlation between the ratio of tangible over total assets and the four-firm concentration ratio (see Table 6.3) may cause a serious multi-collinearity problem. Furthermore, the ratio tangible over total assets may cause multi-collinearity problems because of its design, since it is explicitly linked to three of the five measures of competition that are included in the regression model. Multicollinearity may influence the sign and the height of the estimated coefficient as well as its confidence level. In order to find out to what extent multicollinearity influences the model, we ran some additional regressions.<sup>49</sup> If the variable tangible over total assets is excluded from the model, the estimated coefficients as well as their confidence levels do not significantly differ from the original model. Likewise, the basic results are not influenced by excluding the dummy variable that measures the height of the tangible to total assets ratio and the four-firm concentration ratio for an industry relative to the average values of both these variables over all industries. Finally, if both the variable tangible over total assets and the dummy variable that links this variable to the concentration ratio, are excluded from the analysis, the results on the remaining variables are not markedly different either. The estimated coefficient for the dummy variable that links the ratio tangible to total assets with the profit adjustment measure of an industry remains positive, although its value is much smaller (.29) and far from significant

<sup>&</sup>lt;sup>48</sup> The alternative measure for concentrated shareholdings, the dummy variable that measures the existence of a majority shareholder, does not significantly contribute to the regression model presented in Table 6.5. Apparently, private firms have on average just as many majority shareholders as public firms, whereby information about the existence of a majority shareholder for the IPO firms is derived from the prospectus.

(significant at .46). On the basis of these robustness checks we conclude that the model, including all three measures for competition, does not show serious problems due to multicollinearity between the measures of competition.

The measure for the speed of profit adjustment in an industry,  $\alpha_{2j}$ , is an autocorrelation parameter and therefore it has to range from 0 to 1. For 13 of the 113 (11%) industry estimates this condition is not met. In two industries the estimated coefficients are negative but not significantly different from zero, and in 11 industries the estimates exceed 1. When these 13 industries are excluded from the analysis all results and inferences remain the same.

In order to further check the results of the estimation of the basic model, we have divided the total sample into two subgroups, based on size as well as age, and estimated equation (6.2) for each subgroup separately. The hypotheses derived from the MS model are based on the assumption that public capital is cheaper than private capital for all firms from the sample. If, however, this assumption were to be incorrect, it could seriously obscure the inferences. The assumption that public capital is cheaper than private capital may be incorrect if firms are relatively small or relatively young. Since in general the fixed costs related to public issues are larger and since the size of an issue is positively related to firm size, the smaller the firm is, the more private issues may be favored over public ones. Moreover, adverse selection costs are generally higher for IPOs due to the lack of an extensive track record and low visibility (Chemmanur and Fulghieri, 1999). This adverse selection argument is very likely to influence the listing decision of relatively small and young firms. Although both size and age are controlled for in the basic analysis, we will explore their relationship with the dependent variable more thoroughly since the predictions of the MS model are significantly different in case public capital is more expensive than private capital (see Chapter 4).

If public capital is more expensive than private capital, the MS model predicts that the likelihood of public financing is higher if the proprietary costs are relatively high. The intuition behind this idea is that whenever the costs of public capital exceed the costs of private capital, a partial financing equilibrium can only be sustained when privately financed firms incur the proprietary costs (otherwise all firms would prefer private financing). An increase in the proprietary costs, then, means that private financing becomes relatively less attractive com-

<sup>&</sup>lt;sup>49</sup> The results from these additional regressions are not reported.

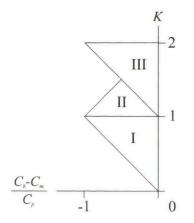
pared to public financing, since publicly financed firms can avoid the (increased) proprietary costs with positive probability, whereas private firms can not. It can therefore be concluded that an increase in proprietary costs leads to an increase in the number of firms that prefer public financing in case public capital is relatively more expensive.

With regard to the threshold value the model provides no unambiguous prediction if private capital is the cheaper capital source. Although partial financing equilibria are more common with relatively low threshold values, both a full public and a full private financing equilibrium is possible with relatively high threshold values. An intuitive explanation for the ambiguous relation between the threshold value and the incentive to go public runs as follows. In case of relatively low threshold values, the proprietary costs do not differentiate much between both financing opportunities, since the chance of avoiding the proprietary costs is rather small. Only when the proprietary costs are relatively high compared to the capital cost differential, are partial financing equilibria rather than full private financing equilibria sustainable. If in a partial financing equilibrium the threshold value increases, the attractiveness will increase of choosing for the more expensive capital form in order to reduce the expected proprietary costs. Hence, in a partial financing equilibrium more firms will choose public financing when the threshold value increases.

If the threshold value increases to such an extent that it reaches a level at which partial financing can no longer be sustained, both full financing strategies are possible. The existence of a full private financing equilibrium can be explained as follows. For relatively high threshold values the likelihood decreases that the opponent will impose proprietary costs when private financing is observed. Hence the *expected* proprietary costs will decrease, as well as their influence on the financing decision. Consequently, capital cost considerations will dominate the financing decision, leading to a full private financing equilibrium. However, when the proprietary costs are relatively high – i.e. the ratio of the capital cost differential over the proprietary costs is relatively low – an opponent could also successfully pursue a strategy of imposing the proprietary costs whenever he observes private financing – i.e. the opponent may have skeptical beliefs (see Chapter 4 and also footnote 5 in Chapter 2). In this case a full public financing equilibrium may occur whenever the reduction in expected proprietary costs exceeds the capital cost differential for the best firm. Hence, an unambiguous relation between the height of the threshold value and the likelihood of going public cannot be derived from the MS model. The predictions from the MS model when private capital is cheaper than public capital are illustrated in Figure 6.2.

The results from separately estimating the equation (6.2) for sub-samples based on the criteria of being larger or smaller, respectively being younger or older, than the median firm, shows the following (these results are not reported). Overall, the signs of the estimated coefficients of the competition measures do not change, although these estimates are all insignificant for the sub-sample of relatively smaller and older firms, respectively. Furthermore, it appears that the influence of the joint effect of the relative concentration and tangible asset investment rate in an industry on the decision to go public is less strong if the sample is subdivided into size and age. The negative relation between going public and the joint-effect of these two measures of competition only applies to relatively young firms. Thus, the general inferences from the influence of competition remain unchanged, but hold good in the first place for relatively large and young firms. The relative invariability of the primary results supports the assumption that public capital is the cheaper capital source for the sample firms. This

Figure 6.2: The conditions for which a partial financing equilibrium is viable in the Marra & Suijs model when the costs of public capital exceed the costs of private capital This figure is partly a junction of Figure 4.5 in Chapter 4. Area I denotes for which values of the exogenous variables  $(K, C_p, C_b, \text{ and } C_m)$  a partial financing equilibrium is sustained by the model. Area II depicts the values for which both a partial and a full private financing equilibrium can be sustained. Finally, Area III denotes for which values of the exogenous variables a full public as well as a full private financing equilibrium may occur. Outside these three areas only full private financing equilibria are sustainable.



robustness test further supports the conjecture on size: the variable size loses its significance (the estimated coefficient is even negative) if equation (6.2) is estimated for the relatively small firms only. With respect to age the results indicate a positive influence on the likelihood of going public (although very small), but only for relatively young firms.

#### 6.8 Summary and Discussion

The main purpose of the empirical study reported in this chapter is to provide evidence for the influence of competitor-related proprietary disclosure costs on voluntary corporate disclosures. More specifically, we have tested whether an IPO as a measure of expanded voluntary disclosure is related to characteristics of the competitive environment of IPO firms. This study considers whether the decision to go public is being influenced by concerns with regard to disclosure. Leaving the shelter of a private capital market causes a considerable and definite change in the firm's disclosure environment. Hence, if the costs and benefits related to corporate disclosure to be as important as other corporate activities, like financing – an IPO should be influenced by it.

With regard to the influence of the competitive environment of firms on expanded voluntary disclosure, we find that firms from high capital-intense industries (measured by the average ratio of tangible assets to total assets) are less likely to go public. If industries with high entry barriers are on average less competitive, this contradicts the general notion that firms from more competitive industries will disclose less. This result supports Harris (1998) who also finds a positive relation between competition and disclosure. Our results do not show a direct relationship between the concentration and speed of profit adjustment in an industry and going public. This is in contrast with Harris (1998), who finds a significant negative relation between these two measures of competition and the willingness of managers to disclose.

When the different measures of competition that are used in this study are combined in accordance with the MS model presented in Chapter 4, our results show the following. Firms are less likely to go public if their main activities take place in an industry with an above-average proportion of tangible assets to total assets and a below-average four-firm concentration ratio. This result is consistent with the MS model, which predicts that the decision to go public is jointly determined by a threshold value, indicating the likelihood of a competitor imposing proprietary costs, and the height of these proprietary costs. Furthermore, firms are more likely to go public if their main industry has a relatively high proportion of tangible to total assets and a relatively high speed of profit adjustment. If the speed with which above-normal profits in an industry adjust to a normal level is to be considered as an estimate of the height of the proprietary costs possibly imposed on an incumbent firm, then this is not reflected in the MS model.

Overall, this study provides some interesting results about the relation between a firm's competitive environment and its propensity to disclose. It shows evidence for a nonmonotonic relationship between the degree of competition and firms' openness. The results, however, are miscellaneous and do not provide a consistent view on the relation between competition and voluntary disclosure. More research is needed to further increase our insights into the influence of competitor-related proprietary costs on corporate disclosure. Nonetheless, the results give some clue as to whether and how competition influences the disclosure and financing choices of firms. Accounting standard setting bodies as well as capital market authorities should be aware of this influence. Fear of opportunistic behavior or the creation of a levelplaying field should not be the only motives for the regulation process. The effect of changes in disclosure requirements on the likelihood of leaking proprietary information has to be accounted for as well. Although the analysis in this chapter provides some evidence for the negative relation between the extent of a firm's openness and product market competition, this does not imply that accounting discretion should be increased. History has shown too many examples of managers who were able to hide their opportunistic behavior behind a veil of accounting flexibility. Perhaps it is unavoidable that the benefits of public capital (either temporary or long term) are inaccessible to certain firms, due to proprietary cost considerations. If that is the case, the function of the private capital market is highlighted not only as a delivery room for economic wealth, but also as a full-bodied alternative for public capital markets.

#### Appendix 6.A: Definition of the variable Cash Flow from Operations

This appendix shows how the variable Cash Flow from Operations is calculated. The threeletter combinations in parentheses refer to the REACH-database coding.

Net Sales (AAA)	(+)
Operational expenses	(')
Staff costs ("Personeelskosten") (ABA)	(-)
Depreciation tangible fixed assets (ABB)	(-)
Depreciation intangible fixed assets (ABC)	(-)
Release of investment account act ("Vrijval WIR") (ABD)	(+)
Cost of sales - commercial enterprise ("Inkoopwaarde omzet") (ABE)	(-)
Cost of sales - production enterprise ("Kostpijs omzet")(ABF)	(-)
Raw materials and consumables ("Grond- en hulpstoffen") (ABG)	(-)
Contracted work ("Uitbesteed werk") (ABH)	(-)
General administrative expenses ("Algemene beheerskosten") (ABI)	(-)
Selling expenses ("Verkoopkosten") (ABJ)	(-)
R&D expenses ("Research & Ontwikkeling") (ABK)	(-)
Sale tangible fixed assets ("Verkoop materiele vaste activa") (ABL) Currency translations ("Valuta aanpassingen") (ABM)	(+) (-)
Change in value of tangible fixed assets (ABN)	(-)
Change in value of current assets (ABO)	(-)
change in value of current assets (ADO)	+
Earnings Before Interest and Taxes	EBIT
Effective tax ("Effectieve belastingdruk") ([BI/BH]*EBIT)	(-)
Taxes payed ("Winstbelastingen") (BI)	
Earnings before taxes ("Resultaat voor belastingen") (BH)	
N. O	+
Net Operating Profits Less Adjusted Taxes	NOPLAT
Depreciation tangible fixed assets (ABB)	(+)
Depreciation intangible fixed assets (ABC) Change in provisions ("Verandering in voorzieningen") (ΔDD)	(+) (+)
Pension commitments ("Pensioenverplichtingen")	(+)
Deferred taxes ("Latente belastingen")	
Revision fund ("Revisifonds")	
Reservation social fund ("Reservering sociaal fonds")	
Reorganizations ("Reorganisaties")	
Remaining provisions ("Overige voorzieningen")	
Non-specified provisions ("Niet-gespecificeerde voorzieningen")	
Undefined provisions ("Ongedefinieerde voorzieningen")	
Change in equalization accounts investment account act subsidy ( $\Delta DC$ )	(+)
Release of investment account act ("Vrijval WIR")	
Investment account act subsidy ("WIR-premie")	
Result non-consilidated investments ("Resultaat niet-geconsolideerde deelnemingen")	
Proceeds from investments ("Opbrenst financiele vaste activa") (BAA)	(+)
Payments on investments ("Kosten financiele vaste activa") (BBA)	(-)
Gross Cash Flow	GCF +
Investments in net working capital ("Investeringen in netto werkkapitaal")	UCI
Inventories ("Voorraden") (CDA)	(+)
Receivables ("Vorderingen") (CDB)	(+)
Cash and cash equivalents ("Kas, Bank en Giro") (CDDA)	(+)
Accrued liabilities ("Vooruitontvangen") (DGC)	(-)
Commercial credit ("Handelskredieten") (DGD)	(-)
Bills/cheques payable ("Wissels/cheques") (DGE)	(-)
Taxes and social contributions ("Belasting/sociale premies") ((DGH)	(-)
Pension liabilities ("Pensioenschulden") (DGI)	(-)
Other accrued liabilities ("Overlopende passiva") (DGJ)	(-)
	+
Cash Flow Operations	CFO

# Chapter 7

### **Summary and Conclusions**

Does honesty pay or is it true that silence is golden? Questioning these two notions of common wisdom is at the heart of this thesis. More specifically, the thesis studies the trade-off between truthful disclosure (i.e. honesty) and nondisclosure (i.e. silence) regarding management communication with outside investors in the presence of a competitor that may use the disclosed information to the firm's disadvantage.

The communication between firms' management and outside investors is important in facilitating the selling of claims on the firms' assets. Generally, the more open a firm is towards investors, the more attractive the conditions under which claims can be sold will be. Externally financed firms, however, do not always show full engagement towards informing outside investors. There are many examples that prove the existence of incomplete management communication with outside investors. One of the explanations for this phenomenon is that management may find difficulties in explaining real economic performances, because it lacks the means to disclose this information in an economically responsible way. If, namely, the costs of disclosure exceed the benefits, management would act economically irresponsible if it were to disclose and, hence, it would be better to be silent. A possible substantial cost in this respect, which is often mentioned by practitioners and academics, is the cost associated with leaking confidential or proprietary information to product market competitors.

Management communication with outside investors is particularly relevant to the growing firm, for its investment needs are more likely to exceed internal financing sources. For the relatively large growing firm that considers outside financing we can distinguish two main sources of capital: public and private capital. Public capital markets are generally believed to provide higher liquidity and more diversification opportunities than private markets. Private capital markets on the other hand provide more opportunities to protect proprietary information, for privately held firms can more easily communicate with investors in private. The trade-off between these two aspects of external financing is the topic of this thesis. It aims at increasing our insight into the role and relevance of proprietary disclosure costs in manage-

ment communication with outside investors. Apart from an academic interest in this subject, the results of our study may also be of interest to accounting regulators and capital market authorities in that it can support their task of regulating corporate investor communications.

The natural notion in respect of the association between the degree of firms' openness and product market competition is that more competition will lead to less openness or disclosure. The validity of this notion, as well as others, is explored in Chapter 2 of this thesis, in which an overview is presented of the seminal analytical papers on corporate disclosure in the presence of a competitor. The natural notion regarding the influence of competition on disclosure is captured by the disclosure model of Verrecchia (1983) – one of the first studies that analytically explored the effect of disclosure costs on voluntary corporate disclosure. Verrecchia shows that if (proprietary) disclosure costs can mainly be considered as a direct cost, firms will disclose less as the disclosure costs get higher.

If, however, disclosure costs can primarily be considered as an indirect cost, i.e. they need not necessarily follow from disclosure, Wagenhofer (1990) shows that the former conjecture need not be true. Despite the maintained assumption that firms would like to be silent in an attempt to hide favorable information from their competitors (and want to disclose this information to public investors), more competition need not necessarily lead to less disclosure. In Wagenhofer's model the degree of product market competition is captured by two exogenous variables: a threshold value of private information, representing the likelihood that a competitor will take an adverse action in a full information environment, and a proprietary cost, representing the magnitude of the adverse action. Disclosure costs arise from a competitor who may impose the proprietary cost if he beliefs, conditional on the firm's disclosures, the firm's private information to exceed the threshold value. When disclosure costs are primarily proprietary in nature, as is generally maintained, and if we believe these costs to arise as described above, Wagenhofer shows that disclosure is not monotonically decreasing in the level of competition. The incidence of withholding information in an attempt to not inform competitors can only be sustained by the model if both the threshold value and the actual proprietary cost that may be imposed are relatively high, or - if both variables are relatively low – the variables are about the same magnitude.

If highly competitive environments coincide with low threshold values and high proprietary costs, the model predicts that firms from highly competitive industries are not able to with-

hold their proprietary information and consequently have to disclose fully. Similarly, the model predicts that in industries with high threshold values and low proprietary costs, i.e. in low-competitive industries, firms will engage in full disclosure. Only when both variables are rather high or equally important, i.e. in moderate competitive industries, can a firm succeed in (partially) hiding its proprietary information, according to the model.

Both the models of Verrecchia (1983) and Wagenhofer (1990) assume that disclosures are truthful. Newman and Sansing (1993) and Gigler (1994) have studied the informativeness of disclosures when untruthful disclosure is allowed. Newman and Sansing predict that if disclosures may be untruthful, they will be more informative (if informative at all) when the cost imposed by a competitor is high and the chance that this cost will be imposed is very low or high. The model assumes that the existence of a competitor possibly imposing a proprietary cost subverts the otherwise truthful communication of the firm towards its public investors. With a relatively high proprietary cost and a moderate chance that the competitor will impose this cost, the competitor will be more interested in the firm's messages, making the firm more reluctant of informing its investors. This prediction is more or less in accordance with Wagenhofer who also predicts that the influence of the firm's competitive environment on its disclosure strategy is highest when the degree of rivalry is average. Gigler's model shows that if firms wish to mislead the capital market, an assumption different from the other disclosure models, proprietary costs can increase voluntary disclosures by generating credibility for such disclosures. Again, there must be a balance in the interests of the firm with both the capital and product market to make informative disclosures possible where there would otherwise be no disclosure at all.

The disclosure models described in Chapter 2 provide some hints as to how competitorrelated proprietary costs might influence management communication with public investors. These models, however, neglect the possibility of attracting capital from other sources than public investors, which may affect a firm's disclosure opportunities. For instance, instead of going public a firm may stay private and finance its investment with, for example, venture capital. The likelihood of providing competitors with useful information is likely to be lower in the latter case, as will be the expected proprietary cost. Hence, from a perspective of hiding proprietary information, a firm seems to be better off by staying private. Of course, it are not only expected proprietary costs that make a difference between public and private financing. Liquidity, diversification and control issues, among other things, are also likely to influence this decision.

The trade-off between marginal disclosure and other marginal financing costs is analyzed analytically in Chapters 3 and 4. Chapter 3 provides an introduction to and preview of the model presented in Chapter 4, in which a firm's financing decision, in particular the decision to go public, is made conditional on the firm's competitive, disclosure and financing environments. Competition is defined conform Wagenhofer's model. With respect to the disclosure environment four different scenarios are considered and regarding the financing environment the situations in which public capital is cheaper and more expensive than private capital (apart from proprietary disclosure costs) are both considered.

The model in Chapter 4 presents a firm that is in need of external capital, for example to finance a new investment project. The goal of the firm is to maximize the expected price of the shares it wants to sell, i.e. to maximize the share price net of all financing costs including proprietary disclosure costs. The firm may enter the public capital market or stay private and, for example, enter the venture capital market. If it chooses to go public, the firm is assumed to provide more public disclosures than if it stays private. Hence, the possibility to protect its proprietary information is lower with public financing. Proprietary costs are modeled as in Wagenhofer, i.e. they are imposed on the firm once a (potential) competitor believes the firm's proprietary information to exceed a certain threshold value. Different from Wagenhofer, these beliefs are conditional on the firm's disclosure *and* financing decision.

In the simplest of the disclosure environments that are considered in Chapter 4, publicly financed (public) firms must *publicly* disclose their private (proprietary) information whereas privately financed (private) firms do not. This disclosure setting may represent a jurisdiction in which the differences between (public) disclosure requirements for listed and unlisted firms are relatively high, like in the US. Alternatively, it may represent a setting in which the specific proprietary information must be publicly disclosed by a public firm and not by a private firm, for example information about a new investment project the firm wants to finance (which generally must be publicly disclosed by a public offering of securities). Apart from the simple disclosure setting, more complex settings are considered in the model. A setting is considered in which listed firms may voluntarily disclose their proprietary information, and settings in which unlisted firms may choose to disclose publicly and listed firms must or may

disclose publicly, respectively, are also considered. These alternative disclosure settings, however, do not significantly alter the main findings derived from the more simple disclosure environment.

In the model elaborated in Chapter 4 the firm has to decide first which capital market to enter after which the possible disclosure of its proprietary information may occur. At the moment the firm decides on its source of financing, it is assumed not to know the precise content of the proprietary information yet, but it knows only the probability that it will receive good information at a later moment, i.e. after the decision to go public or not has been made. It is further assumed that the expectation a firm has regarding the precise content of the proprietary information it will receive, cannot be disclosed credibly (or is too expensive to disclose credibly). The former assumptions reflect a difference in magnitude and time regarding the going-public and disclosure decision. Going public for most firms is a once in a lifetime decision, whereas the decision to disclose or withhold proprietary information has to be made more frequently. Hence, of interest is not only the proprietary information that may be possessed at the time a firm goes public; the information a firm may receive at later moments in time may also be interesting. This idea is captured by explicitly separating the content of the proprietary information and the possibility to disclose it at both decision moments. Summarizing, proprietary costs are assumed to enter the decision to go public as an endogenous cost that may be imposed by a competitor who conditions his actions on the firm's financing decision (at which moment the firm has incomplete information about its proprietary information) and subsequent possible public disclosure of the proprietary information (which meanwhile has been revealed to the firm).

When public capital is cheaper than private capital (apart from proprietary disclosure costs), the model provides the following predictions regarding a firm's going-public decision. First, there can always be an equilibrium in which all firms go public, i.e. a full public financing equilibrium, and there may exist equilibria in which some but not all firms go public, i.e. a partial financing equilibrium. Furthermore, in a partial financing equilibrium the better firms – those firms that expect to receive the most valuable information for their competitors – stay private and successfully deter competitors from imposing proprietary costs. Finally, partial financing equilibria can only occur when the threshold value is relatively high and the proprietary cost that may be imposed is high relative to the capital cost difference.

The omnipresence of a full public financing equilibrium when public capital is cheaper than private capital absent proprietary costs, implies that the competitor cannot be refrained from following a strategy in which he will always impose the proprietary cost when he observes nondisclosure (which is similar to staying private in the simple model). More interesting are the cases in which the competitor will not take the adverse action when he observes nondisclosure, even if the proprietary information exceeds the threshold value. These cases are more interesting because the firm succeeds in mitigating the proprietary cost it would have to incur in a full information environment. An equilibrium in which the firm chooses private financing and the competitor will not take the adverse action can only occur when the threshold value is so high that a competitor a priori is unlikely to take the adverse action. In addition, the possible proprietary cost must be so high that it is interesting for a firm to incur the additional cost of private capital. It is obvious that the firms that expect to receive the most interesting private information and thus have the highest expected proprietary costs when going public, are the first to consider staying private in a partial financing equilibrium.

The predicted influence of product market competition on the decision to go public has much in common with the disclosure models of Wagenhofer, Newman and Sansing, and Gigler. These models also predict that competition has the most effect on the degree of a firm's openness when the interest of the firm with both outside parties (competitors and investors) is of a similar magnitude. If one of the two interests dominates the other, a full informative or noninformative (in the case of Gigler's model) equilibrium becomes more likely. Hence, all these models predict a nonmonotonic relationship between competition and (informative) disclosure, a relationship that is different from the disclosure model of Verrecchia, in which the association between competition and disclosure is strictly negative.

In the event that public capital is more expensive than private capital (apart from proprietary disclosure costs), the model sustains the occurrence of all three equilibrium classes: partial, full private and full public financing equilibria. Partial financing equilibria occur whenever the threshold value is relatively low and the proprietary cost is relatively high. Full private financing equilibria are always possible when the proprietary cost is relatively low or when the threshold value is relatively high. With a relatively high threshold value partial as well as full public financing can occur.

The occurrence of a preference for private financing by all firms when private capital is cheaper than public capital (apart from disclosure costs) is obvious under the assumption that it is more difficult to hide proprietary information in a public environment. Hence, it is especially interesting to provide an intuition for the existence of partial and full public financing equilibria when private capital is cheaper (absent proprietary disclosure costs). An outcome in which all firms prefer to go public can occur when competitors impose the proprietary cost whenever they observe private financing. The model cannot rule out such a strategy of the competitor when the threshold value is relatively high and the expected value of not imposing the proprietary cost for the highest quality firm when it goes public exceeds the difference in other financing costs. Therefore, for all firms for which the threshold value is high, a preference for going public cannot be excluded, despite the higher cost of public capital (apart from proprietary disclosure costs). It is, of course, an opposite difference in the proprietary cost that drives this result. For relatively low threshold values, i.e. a relatively low chance of an adverse action by a competitor in a full information environment, a unique partial equilibrium can occur in which the higher quality firms stay private and get imposed the proprietary cost, and the lower quality firms go public (to mitigate proprietary costs). Finally, partial financing equilibria are also possible when the threshold value is relatively high.

The main predictions that can be derived from the model presented in Chapter 4 are empirically tested in Chapter 6. In Chapter 6 the existence and role of competitor-related proprietary costs is investigated for a sample of Dutch firms, by comparing characteristics of the competitive environments of firms that recently went or could have gone public on the stock exchange of the Amsterdam Exchanges. An overview of the main differences in the disclosure environments of publicly and privately held firms in the Netherlands is provided in Chapter 5. In this chapter characteristics of the main parties and institutions within the Dutch disclosure environment are presented to support the view that public firms face a higher pressure to disclose and therefore have more difficulties protecting their proprietary information. The higher pressure to disclose emerges from the following elements in particular: (i) additional disclosure rules set by securities exchanges that are enforced by special supervising bodies, (ii) higher public scrutiny due to the presence of public investors and the consequent increased attention by financial analysts and the press, and (iii) a higher risk of being the subject of a conflict of interests due to higher public involvement in and awareness of the firm, which is likely to lead to a more widespread effect of negative events. Although the change in the disclosure environment of a US IPO firm is likely to be larger than for a Dutch IPO firm, the step from private to public financing generally causes a considerable change in firms' disclosure and monitoring.

The following two predictions are tested in Chapter 6. First, we will test whether the association between competition and firms' openness is as predicted by the model presented in Chapter 4, to which we will refer to as the Marra & Suijs (MS) model from now on. Second, we will test whether private firms are on average more profitable than public firms. With respect to the influence of product market competition on firms' openness, the MS model predicts that firms that compete in an environment that is characterized by a high threshold value and a high proprietary cost are less open and therefore less likely to go public than firms with other competitive environments. The threshold value and the proprietary cost are measures for the chance that competitors will react adversely on firms' investor communications and the magnitude of the adverse reaction, respectively. In this study the chance that a competitor will react adversely is measured by the barriers to entry of an industry. Three main barriers can be distinguished: capital, marketing and R&D intensity. The available data only allow for the meaningful measurement of industries' capital intensity, which is proxied for by the average ratio of tangible over total assets of all firms in a particular industry.

The other variable in the MS model that represents the magnitude of a possible adverse reaction on firms' investor communications is related to the degree of competition within an industry. It is assumed that the degree of competition within an industry is positively related to the proprietary cost. The degree of competition in an industry is proxied for by two measures, namely the four firm concentration ratio and a measure for the speed with which abovenormal profits in an industry return to a normal value.

For some measures of competition we find a significant association with the likelihood of going public, providing support for the notion that competitor-related proprietary disclosure costs influence the decision to go public. With respect to the sign of the interrelationship, our results show a strong negative association between the ratio of tangible over total assets of an industry and the act of going public. This finding implies that firms from high capital-intense industries are less likely to go public and, thus, can be considered as less open. Thus, it appears that the threat of entry from potential competitors is positively related to disclosure. To the extent that abnormal profits are more likely in less competitive industries, this result can be interpreted as an attempt of managers to conceal information that would prompt

potential rivals to enter their businesses and capture a part of the abnormal profits. This result partly supports the MS model, which predicts a lower likelihood of going public when threshold values are relatively high and public financing costs are lower than private financing costs (apart from proprietary disclosure costs).

The other measures of competition – the four firm concentration ratio and the speed of profit adjustment in an industry – do not show a significant statistical relationship with the incidence of going public. When, however, these two measures are explicitly and separately combined with the capital intensity measure, significant relationships can be reported. We find that firms from industries with above-average capital intensity (i.e. with high barriers to entry) and below-average concentration ratios (i.e. high rivalry in the industry) are less likely to go public and therefore appear to be less open. This finding supports the MS model which predicts the highest influence of competition on the degree of openness when threshold values as well as proprietary costs are relatively high. When the other proxy for the height of the proprietary cost is directly combined with the capital intensity measure, our results show the opposite. Firms from industries with an above-average capital intensity and an above-average speed of profit adjustment (indicating high rivalry in the industry) show a higher likelihood of going public.

All results on the influence of product market competition hold after controlling for size, age, capital constraints, and ownership structure. IPO firms are on average larger than potential IPO firms, which is consistent with the existence of economies of scale with public offerings of capital. The estimated positive relationship between going public and firm size is also consistent with the expectation that adverse selection costs are higher for smaller firms, making a public offering less attractive. Adverse selection costs are also expected to be higher for younger firms. The positive and significant coefficient for age is consistent with this prediction. The influence of capital constraints on the decision to go public is controlled for by the variables cash flow from operations over total assets and growth in sales. The empirical evidence shows a significant difference in performance between IPO firms and non-IPO firms from the sample. IPO firms outperform non-IPO firms in the research period, based on cash flow from operations relative to total assets. Hence, it appears that the IPO firms from the sample did not enter the public capital market due to a lack of internal capital. Furthermore, this result contradicts the expectation derived from the MS model that public firms should on average be less profitable than privately financed firms. A firm's growth in sales turns out to

have a significant positive influence on the likelihood of going public. This finding indicates that growth firms on average prefer to finance their growth with public equity capital. Finally, our results show significant differences in ownership structure between IPO firms and non-IPO firms. As expected, the presence of a venture capitalist positively influences the likelihood of going public. Also, the number of external shareholders with a substantial interest ( $\geq 5\%$ ) in the firm's equity capital positively influences the likelihood of going public. This result contradicts the expectation that firms with a more concentrated shareholder base are more likely to stay private to protect their control rights. Furthermore, evidence is found to support the notion that family-controlled firms are less likely to go public.

Summarizing, our research provides a framework that shows how competitor-related proprietary disclosure costs may influence the firm's decision to go public and shows evidence to support the empirical relevance of this framework. However, the empirical results are mixed, which may indicate that the relationship between product market competition and the degree of firms' openness is not fully captured by the model. Alternatively the proxies for competition used in our study do not sufficiently capture the different and complex aspects of competition. Of course, we cannot expect a simple model to fully explain a complex phenomenon like going public. Nevertheless, our study provides support for the notion that product market competition influences the decision to go public and that this influence is likely to run via a difference in the disclosure environments that apply to the different capital markets. The results may be of interest to capital market authorities as well as accounting regulators. A change in the disclosure requirements or monitoring which has different effects for public and private firms, may influence firms' financing opportunities through its influence on the ability to protect proprietary information.

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## **Nederlandse Samenvatting**

Deze dissertatie onderzoekt in welke mate vertrouwelijkheid van informatie de communicatie van managers met beleggers kan hinderen. De algemene notie inzake management communicatie met beleggers is dat meer communicatie de prijs van de vermogenscomponenten, zoals aandelen en obligaties, zal verhogen en de financieringskosten zal verlagen. Echter, indien de informatie die het management van een onderneming communiceert naar beleggers kan worden onderschept door derden die deze informatie kunnen gebruiken tegen het belang van de onderneming, kan het management terughoudend worden in de communicatie met beleggers.

Een veelgenoemde derde partij die de communicatie tussen het management en beleggers in de weg kan staan is de productmarktconcurrent. Het voortijdig informeren van concurrenten over vertrouwelijke zaken is een veelgehoord argument tegen het geven van meer openheid. Het management zou bijvoorbeeld, in een poging de aantrekkelijkheid van haar onderneming voor beleggers te verhogen, het succes van haar onderzoeksactiviteiten publiekelijk bekend kunnen maken. Dat kan echter tot gevolg hebben dat concurrenten op deze informatie zullen inspelen met nadelige gevolgen voor de toekomstige winstmogelijkheden van de onderneming. Vooral deze indirecte kosten van het voortijdig informeren van concurrenten zouden het voordeel van een toename in openheid teniet kunnen doen. De concurrentiegerelateerde communicatiekosten worden algemeen gezien als de belangrijkste kosten van communiceren.

Het probleem van het mogelijk voortijdig informeren van concurrenten wordt in deze dissertatie vooral betrokken op de beslissing van het management om naar de beurs te gaan. In dit verband kan worden gedacht aan een jonge sterk-groeiende onderneming die overweegt een "Initiële Publieke Offrering" (IPO) te doen. Publiek vermogen wordt algemeen gezien als een relatief goedkope financieringsbron, omdat publiek verhandelde vermogenscomponenten makkelijker te verhandelen zijn. Echter, de communicatie-omgeving van een onderneming die aandelen wil verkopen op een publieke vermogensmarkt verschilt sterk van de communicatieomgeving van een onderneming die privaat blijft. Publieke ondernemingen moeten zich doorgaans aan meer communicatieregels committeren en zij worden nauwlettender in de gaten gehouden door toezichthoudende instanties en de financiële pers. De toename in regels en toezicht zal een publieke of beursgenoteerde onderneming dwingen meer informatie publiekelijk te communiceren, maar zal ook de vraag naar publieke informatie in het algemeen laten toenemen. Tevens zullen de prestaties van een beursgenoteerde onderneming meer in het publiek worden uitgemeten. Deze veranderingen in de communicatie-omgeving van een publieke onderneming zullen de kans op het voortijdig informeren van concurrenten, bijvoorbeeld over de groeistrategie of investeringsplannen van de onderneming, verhogen. Ondanks de hogere financieringkosten zou een onderneming dan toch kunnen kiezen voor private financiering om zo haar concurrentiegevoelige informatie beter te kunnen beschermen. De afruil tussen enerzijds lagere financieringskosten (dan wel een hogere aandeel- of obligatieprijs) door publiek te gaan en anderzijds hogere communicatiekosten in verband met het voortijdig informeren van concurrenten, vormt het centrale thema in dit proefschrift.

Inzicht in de relevantie en specifieke invloed van concurrentiegerelateerde communicatiekosten op de mate van managementcommunicatie met beleggers is van belang voor regelgevende en toezichthoudende instanties. Dit geldt voor regelgevers en toezichthouders van publieke vermogensmarkten maar ook voor regelgevende en toezichthoudende instanties die belast zijn met managementcommunicatie in het algemeen. Regelgevers en toezichthouders streven in het algemeen naar een verhoging van de informatie-inhoud van managementcommunicatie. Dit streven komt onder andere tot uitdrukking in het aantal en de rigiditeit van de communicatieregels in het algemeen en de financiële verslaggevingsregels in het bijzonder, en de mate van toezicht op het navolgen van de regels. Meer en strengere regels als wel een strenger toezicht beogen de vergelijkbaarheid tussen met name de financiële prestaties over de tijd en tussen ondernemingen te verhogen, en de mogelijkheden tot frauderen te verlagen. Echter, een verscherping van de communicatieregels en het toezicht op de naleving daarvan kan ook leiden tot een verhoging van de concurrentiegerelateerde communicatiekosten. Dit effect van een verscherping van de verslaggevingsregels en het toezicht wordt dikwijls geclaimd door het bedrijfsleven. Er bestaat echter weinig wetenschappelijk bewijs ter ondersteuning van deze claim en daarom is onderzoek naar de relevantie en rol van deze kosten belangrijk.

Verschillen in de mate waarin informatie kan lekken naar concurrenten kan ook van belang zijn met betrekking tot de competitie tussen verschillende vermogensmarkten. Zoals eerder beschreven kan dit informatieprobleem van invloed zijn op de meer algemene keuze tussen de publieke en private vermogensmarkt. Het zou echter ook een rol kunnen spelen in de afweging tussen verschillende publieke vermogensmarkten. Het management van een onderneming, bijvoorbeeld, die besloten heeft haar vermogensbehoefte publiek te financieren en die toegang heeft tot meerdere publieke vermogensmarkten, zou een verschil in communicatieeisen tussen de verschillende publieke vermogensmarkten kunnen meewegen in haar keuze voor een bepaalde markt. De mate waarin concurrentiegevoelige informatie kan worden beschermd zou dus ook invloed kunnen hebben op de concurrentiepositie van publieke vermogensmarkten onderling.

De problematiek van de invloed van concurrentiegerelateerde communicatiekosten op de communicatiebeslissing en meer in het bijzonder de beslissing om publiek te gaan dan wel privaat te blijven, wordt in dit proefschrift als volgt uitgewerkt. Eerst geven wij in Hoofdstuk 2 een overzicht van de belangrijkste analytische literatuur over de invloed van communicatiekosten op de communicatie van het management met beleggers. Deze literatuur gaat echter grotendeels voorbij aan de relatie tussen de communicatiebeslissing en de beslissing om publiek of privaat te financieren. Doorgaans wordt verondersteld dat ondernemingen reeds beursgenoteerd zijn. Echter, indien een onderneming de keuze heeft om publiek te gaan en private financiering meer mogelijkheden biedt om concurrentiegevoelige informatie te beschermen, kunnen communicatiekosten van invloed zijn op de beslissing om publiek te gaan, kortweg de "publieksgangbeslissing".

In het algemene geval waarin publiek vermogen goedkoper is dan privaat vermogen, kan een onderneming dus worden geconfronteerd met de afweging tussen de lagere vermogenskosten en de hogere communicatiekosten van publiek gaan. Deze afweging analyseren wij in de hoofdstukken 3 en 4 van deze dissertatie. In ons uiteindelijke model, dat beschreven wordt in Hoofdstuk 4, komen wij tot de conclusie dat de invloed van concurrentiegevoelige informatie op de publieksgangbeslissing vooral speelt in situaties waarin sprake is van middelmatige concurrentie. In gevallen waarin de mate van concurrentie laag is, zullen concurrentiegerelateerde communicatiekosten minder belangrijk zijn en zal het vermogenskostenverschil het publieksgangbesluit domineren. Indien de concurrentie hoog is, kunnen communicatieoverwegingen zodanig gaan domineren dat ze geen invloed meer hebben op de publieksgangbeslissing. Als namelijk de kosten van een mogelijke actie van concurrenten hoger zijn, zal het management haar communicatiestrategie meer willen richten op haar concurrenten en minder op beleggers. Van concurrerende managementteams mag echter worden verwacht dat ze op de hoogte zullen zijn van het belang dat een van haar concurrenten heeft bij het beïnvloeden van haar acties. Dit kan tot gevolg hebben dat zij de communicatie zullen negeren. Daarmee vervalt het argument van concurrentiegerelateerde kosten als reden om publieke beleggers niet volledig te willen informeren. Daarom zal in een hoog-competitieve omgeving, net als in een laag-competitieve omgeving, de publiekgangsbeslissing in mindere mate worden beïnvloed door concurrentiegerelateerde communicatiekosten.

Stel bijvoorbeeld de situatie voor van een private onderneming die een nieuw product op de markt wil brengen en daarvoor externe financiering behoeft. Ze kan daartoe een IPO initiëren, maar moet dan publiekelijk communiceren over haar investeringsplannen. Als alternatief zou ze toenadering kunnen zoeken tot een private financier, bijvoorbeeld een venture capitalist, zodat ze haar financieringsplannen privaat kan communiceren. De kans dat deze onderneming gevoelige informatie zal lekken naar concurrenten is logischerwijs hoger in het eerste geval, wat het management zou kunnen weerhouden publiek te financieren. Echter als de concurrentie in een bedrijfstak hoog is, zal het moeilijker worden voor het management om haar private concurrentiegevoelige informatie te verbergen. In een hoog competitieve omgeving zal de concurrentie om waardevolle private informatie ook hoger zijn. Dus, ondanks dat de negatieve gevolgen van een reactie van concurrenten hoog kunnen zijn, zal de onderneming in een hoog-competitieve omgeving weinig kunnen doen om een dergelijke reactie te voorkomen. Concurrentieoverwegingen zullen dan een minder belangrijke rol spelen in de communicatie-strategie waardoor de beslissing om publiek of privaat te financieren in mindere mate door communicatiekosten zal worden beïnvloed.

Alvorens wij overgaan tot het testen van de relatie tussen concurrentiegerelateerde communicatiekosten en publiek gaan, zoals deze wordt voorspeld door het in Hoofdstuk 4 uitgewerkte model, beschrijven wij in Hoofdstuk 5 de verschillen in communicatie-omgeving tussen publiek en private ondernemingen in Nederland. In dit hoofdstuk onderbouwen wij de stellingname dat het management van een privaat gefinancierde onderneming haar concurrentiegevoelige informatie beter kan beschermen. Tevens vergelijken wij in dit hoofdstuk de Nederlandse communicatie-omgeving met die van de Verenigde Staten

De relatie tussen concurrentiegerelateerde communicatiekosten en de beslissing om publiek te gaan zoals deze wordt voorspeld door ons model, wordt in Hoofdstuk 6 van dit proefschrift empirisch getest. Wij vergelijken daartoe de concurrentiekarakteristieken van ondernemingen die publiek zijn gegaan op de Effectenbeurs van de Amsterdam Exchanges tussen 1984 en 1995 met die van een unieke set van private ondernemingen die publiek hadden kunnen gaan

taalintensiteit, de concentratieratio en een winstaanpassingscijfer van de bedrijfstak waarin een onderneming actief is. De kapitaalintensiteit is een maatstaf voor de mogelijke concurrentie van buiten de bedrijfstak en kan worden gezien als een toegangsdrempel van de bedrijfstak. Naarmate het winstgevend kunnen opereren in een bedrijfstak een groter kapitaalbeslag vergt, zal de dreiging van potentiële toetreders lager zijn. De concentratieratio is een maatstaf voor de concurrentie in een bedrijfstak. In het algemeen duidt lage concentratie op een hoge mate van concurrentie in de bedrijfstak. Het winstaanpassingscijfer is ook een maatstaf van de concurrentie in een bedrijfstak en meet de mate waarin bovennormale rendementen in een bedrijfstak tenderen naar een normaal rendement. Indien bovennormale winsten snel tenderen naar een normaal niveau, duidt dat op een hoge mate van concurrentie in de bedrijfstak. Naast deze concurrentiemaatstaven betrekken wij ook zaken als eigendomsstructuur, financieringsbeperkingen, leeftijd en risico in de analyse.

We vinden een sterk negatieve associatie tussen de kapitaalintensiteit en de waarschijnlijkheid van een "publieksgang", welk resultaat impliceert dat een lage dreiging van potentiële toetreders leidt tot een lagere mate van publieke communicatie of, anders uitgedrukt, tot minder openheid. In zoverre hoge winsten meer waarschijnlijk zijn in minder competitieve bedrijfstakken, suggereert deze vinding dat managers minder wensen te communiceren in een poging om concurrenten niet te informeren over de winstmogelijkheden. We vinden geen significante relatie tussen de andere twee maatstaven van concurrentie en de waarschijnlijkheid van een publieksgang. Ons model voorspelt echter een niet-monotone relatie tussen de mate van concurrentie en de openheid van een onderneming. De invloed van concurrentiegerelateerde communicatiekosten zou het hoogst zijn in gemiddeld-competitieve bedrijfstakken. Om bewijs te leveren voor het bestaan van zo'n niet-monotone relatie koppelen wij verschillende concurrentiemaatstaven aan elkaar. Ondernemingen uit een bedrijfstak met een bovengemiddelde kapitaalintensiteit en een benedengemiddelde concentratieratio vertonen een lagere waarschijnlijkheid van "publiekgaan". Dit resultaat impliceert dat ondernemingen uit dergelijke gemiddeld-competitieve bedrijfstakken, waar de dreiging van potentiële toetreders laag is maar de feitelijke concurrentiegerelateerde communicatiekosten hoog zijn, minder open zijn dan ondernemingen uit hoog- en laag-competitieve bedrijfstakken. Aan de andere kant is de waarschijnlijkheid van publiekgaan hoger voor ondernemingen uit bedrijfstakken met een bovengemiddelde kapitaalintensiteit en een bovengemiddelde winstaanpassing. Dit resultaat impliceert dat ondernemingen uit gemiddeld-competitieve bedrijfstakken juist opener zijn.

Een andere belangrijke voorspelling die op basis van het in Hoofdstuk 4 uitgewerkte model kan worden gedaan, is dat de slechtere ondernemingen publiek zullen gaan als private financiering meer mogelijkheden biedt tot het beschermen van concurrentiegevoelige informatie. Deze vinding is onafhankelijk van de aard van het verschil tussen de overige financieringskosten. Dus ook indien de financieringskosten exclusief de concurrentie-gerelateerde communicatiekosten hoger zouden zijn voor publieke ondernemingen, zullen de slechtere ondernemingen de hoogste motivatie hebben om publiek gaan. Deze voorspelling wordt echter niet bevestigd in ons empirisch onderzoek.

Concluderend kunnen we zeggen dat we bewijs hebben gevonden voor het bestaan van een invloed van concurrentiegerelateerde communicatiekosten op de mate van openheid van het management van een onderneming en dat deze invloed het hoogst lijkt te zijn in gemiddeldcompetitieve omgevingen. De niet-monotone relatie tussen de mate van concurrentie en de openheid van het management is echter ambigu. Vervolgonderzoek is nodig om meer duidelijkheid te verschaffen in de relatie tussen productmarktconcurrentie en de communicatie van het management met beleggers.

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TEYE MARRA (1967) graduated in Business Administration (Finance) from Tilburg University in 1993. From October 1993 till September 1997 he was a lecturer at the Department of Business Administration and a member of the IOSA-group of Tilburg University. From October 1997 till September 1999 he was a member of the CentER Accounting Research Group of Tilburg University. As of October 1997 he has been a lecturer at the Faculty of Management and Organization of the University of Groningen.

This thesis studies the influence of proprietary disclosure costs related to informing product market competitors on management communication with investors. In doing so it focuses on the firm's decision to go public. A firm that goes public not only experiences a change in its financial and governance structure, it also has to cope with a more demanding disclosure environment. A central theme throughout the thesis is the trade-off between marginal proprietary disclosure costs and other marginal financing costs related to the choice between public or private financing. This choice is analytically explored in this thesis. We find that the influence of competitor-related proprietary costs on the firm's decision to go public is nonmonotonic and that this influence is the highest for firms that compete in moderately competitive industries. This prediction is empirically tested by comparing industrial characteristics of Dutch Firms that executed an Initial Public Offering on the Stock Exchange of the Amsterdam Exchanges between 1984 and 1995 with firms that were in a position to do so. We find evidence indicating that proprietary disclosure cost considerations influence the decision to go public and that the association between competition and going public is nonmonotonic.

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