Earnings Manipulation:
Cost of Capital versus Tax

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ABSTRACT

We show that if taxable income were linked to accounting income, there will exist an automatic safeguard against manipulation of earnings within the analyzed framework. Separating taxable income from accounting income will remove this self-controlled mechanism, and accordingly create a need for separate countermeasures to prevent earnings manipulation.

1. INTRODUCTION

Financial statements are intended to provide useful information about the performance of firms. Generally accepted accounting principles are vital in determining accounting income, but the accrual options available to most firms yield considerable potential for earnings management (see e.g. Schipper, 1989, and Healy and Wahlen, 1998). Some firms will also be tempted to illegally manipulate earnings (Dechow, Sloan, and Sweeney, 1996). The purpose of this article is to analyze how the link between the calculation of taxable income and accounting income influences the incentive to manipulate earnings, as well as the demand for regulation and verification of both financial statements and tax accounts. The article raises important questions since several countries lately have relaxed, or are in the process of relaxing, the link between taxable income and accounting income (see several articles in *European Accounting Review*, Supplement, 1996). Our analysis also sheds light on recent empirical findings about the value-relevance of accounting in various countries.

We analyze the behavior of a representative firm whose value-maximizing manager has to decide which income figure to disclose to the capital market, provided that the disclosure also influences the firm's tax liability. Before the income is disclosed, the manager is assumed to observe private information about the firm's real economic income. Disclosing a high income attracts additional investors and hence reduces the cost of acquiring new capital. The cost, though, is a higher tax. A reduction in the tax is obtained by disclosing a low income, but then the cost of capital would increase. As in Chaney and Lewis (1995), earnings manipulation derives from the manager making a tradeoff in reporting to lower the cost of capital or to reduce the tax.

Accordingly, the outlined model predicts understatements of income in firms, industries and, indeed, countries with taxable income closely linked to accounting income, along with weak (negative) reactions, if any, in the capital market. Over-

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statements of income, on the other hand, arise when the financial reporting is considered value-relevant by investors, and the computation of taxable income is less dependent on accounting income. Clearly, the need for regulation of both financial reporting and taxation will be affected by the various incentives to misrepresent income.

The main insight provided by this article is that a system in which financial and tax accounting are aligned, might provide less earnings manipulation than an otherwise identical system in which financial and tax accounting are separated. This should not necessarily be interpreted to mean that an aligned system is better than a separated system of reporting, only that a shift from an aligned system to a separated system, or vice versa, changes the firms' incentives to manipulate earnings. This could also alter the need for regulation, both with respect to financial and tax accounting. Thus, this article yields insight into how changes in the alignment between reporting systems should lead to regulatory changes, as specific regulation is more warranted in the separated system than in the aligned system due to the reduction of balancing incentives.

The potential conflict between financial and tax reporting has received considerable attention in recent years. Several empirical studies support the widely held view that firms take actions and trade off potential tax benefits against financial reporting effects in the capital market. For instance, Scholes, Wilson, and Wolfson (1990) find that banks in the United States "are more inclined to take actions that reduce taxes when the costs of doing so, in terms of the effects on income reported to shareholders and regulators, are relatively small and the magnitude of the potential tax benefits is large." Dechow, Sloan, and Sweeney (1996) are analyzing firms in the United States that have been subjected to enforcement actions by the Securities and Exchange Commission for alleged violations of the generally accepted accounting principles. They find that "an important motivation for earnings manipulation is the desire to attract external financing at low cost." Both findings are consistent with how the

manager in our analytical framework determines the firm's optimal disclosure of income to its stakeholders.

The article is organized as follows. Related studies are presented and discussed in Section 2. Section 3 outlines a model that yields two conflicting motives for earnings manipulation when a value-maximizing manager chooses which income figure to disclose. The equilibrium disclosure is then characterized and, as long as there is a close link between taxation and accounting income, it creates a neat balance that makes the disclosed income credible and hence informative. In Section 4, this balancing effect is shown to break down when taxation is made independent of accounting income. Some concluding remarks are given in Section 5. All proofs are found in the Appendix.

2. PREVIOUS STUDIES

Our model shares some important properties with those of Gigler (1994) and Chaney and Lewis (1995). Gigler considers a firm whose tradeoff, when determining which income figure to disclose, is between the cost of acquiring new capital and the cost of competition. The firm would overstate the disclosed income if the reduced cost of capital were larger than the increased cost of competition. What makes the disclosed income credible is that the firm incurs a proprietary cost by misrepresenting income. In equilibrium, these two conflicting motives for income manipulation are balanced at the margin.

Chaney and Lewis (1995) are concerned with whether earnings management might affect firm value when value-maximizing managers and investors are asymmetrically informed. They show that the strategic choice of which income to disclose might influence investors' assessments of the firms' market value and hence the firms' cost of capital. What makes Chaney and Lewis' model particularly interesting in relation to the model presented in Section 3 is that for disclosed income to be a credible

signal of firm value, there must be a cost associated with overstating income. Otherwise, all firms would report the highest possible income level. They model this cost by assuming that the disclosed income is taxable at the corporate level. Corporate taxation creates a tradeoff between the benefit of being identified as a high-value firm and the additional tax liability from overstating income. In equilibrium, the manager of a high-value firm finds it optimal to overstate income because the payment of an excess corporate tax is the only credible way to signal high value. The manager of the low-value firm does not overstate earnings and simply reports the minimum level of income. The low-value firm is unable to take on an increased tax burden.

Although similar in spirit, our model differs significantly from the models of Gigler (1994) and Chaney and Lewis (1995). Gigler looks at the tradeoff in reporting between the cost of increased competition and the cost of acquiring new capital. We follow Chaney and Lewis and look at the tradeoff in reporting between the tax and the cost of capital, but our setting and results are somewhat different from theirs. We are, for instance, analyzing a firm whose manager is maximizing the future value of the firm to current stockholders. Chaney and Lewis' manager is maximizing the current stock market value of the firm. We are focusing on a tax paying firm that (as in Gigler's setup) issues new stocks to finance necessary investments. Chaney and Lewis, however, focus on the valuation of tax paying firms that do not issue new stocks. In the equilibrium outlined in detail in Section 3, a high-value (low-value) firm might find it optimal to understate (overstate) income. In Chaney and Lewis' equilibrium, the high-value (low-value) firm will always overstate (understate) income.

The major difference, though, lies more in the interpretation of the consequences induced by the tradeoff faced by the manager who decides which income figure the firm should disclose to its surroundings. We are highlighting the fact that making taxable income linked to accounting income provides, in a weak sense at least, an automatic safeguard against unwanted earnings manipulation of financial statements

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(see also Jönsson and Marton, 1994, p. 201 for a similar claim – although made informally). Separating taxable income from accounting income, on the other hand, will remove this self-controlled mechanism and might therefore require alternate monitoring and regulation of financial accounts both for taxation and for external funding purposes.

3. THE MODEL

A firm is run by a manager in the single period from time 0 to 1. Let $X \in [a, b]$ be the firm's random income in the period, where $f(X)$ is the probability density of X on $[a, b]$. At time 0, the economic income X is estimated by an internal measurement system, which produces a signal $Y \in [a, b]$ about X, where $f(X \mid Y)$ is the updated probability density of X given Y. Based on the internally estimated income Y, the manager is required to disclose a signal $Z \in [a, b]$ about X at time 0. If $Z = Y$, the disclosure Z would be according to generally accepted accounting principles as defined by some standard-setting organization. However, the disclosed income Z might differ from the measured income Y since it could be in the firm's interest not to report Y.

At time 0 the firm needs a fixed amount of capital $K \geq 0$ to make necessary invest-ments in e.g. property, plant, or equipment. But since the original stockholder (who could be identical to the manager in order to avoid agency problems) does not have enough capital K, he/she has to sell a proportion of the firm $W = K / P \in [0, 1]$ to new investors since, to make the choice simple, there are no other sources of finance available. In addition to K, W depends on the market value of the firm $P \in [a, b]$, which in turn might depend on the disclosed income Z. The market value P is assumed to be determined in a fully competitive stock market with risk neutral investors. Thus, $P = E(X - T \mid Z)$, where $E(\cdot)$ is the expectation, T is the tax, and the discount rate has been normalized to zero. The equilibrium stock price $P(Z)$ could be extended to incorporate other signals available to the stock market, e.g. the result of

a mandatory audit. If the stock market finds the disclosed income Z value-relevant, $P'(Z) > 0$, where $P'(Z)$ denotes the first-order derivative with respect to disclosed income Z.

At time 1 the firm pays the tax $T = t \cdot \max\{E(X \mid Z), 0\} \geq 0$, where $t \in [0, 1]$ is the tax rate. The tax $T(Z)$ could be extended to depend on other informational signals available to the tax authorities, e.g. the result from a randomized tax inspection of the firm's accounts. If the tax authorities find the disclosed income Z relevant for taxation purposes, $T'(Z) > 0$. Accordingly, the firm's real economic earnings in the period from time 0 to 1 are X - T, the measured earnings are Y - T, and the disclosed earnings are Z - T.

The firm's expected earnings $E(X - T \mid Y)$ can be divided into the expected earnings of the original stockholder $(1 - W) E(X - T \mid Y)$ and the expected earnings of the new stockholders $W E(X - T \mid Y)$. Since the stockholders are all assumed to be risk neutral, the manager, acting solely in the interest of the stockholder who owns the firm at the time of the decision, maximizes his/her expected earnings at time 1. If we isolate the manager's decision of which income estimate Z to reveal to the public, his/her problem at time 0 is to maximize the expected earnings of the firm's original stockholder with respect to Z:

$$\max_{Z} \{1 - W(Z)\}\{E(X \mid Y) - T(Z)\},$$

where, under the outlined assumptions, $W(Z)$ and $T(Z)$ are functions of the disclosed income Z. The manager's problem is identical to minimizing $W(Z) \{E(X \mid Y) - T(Z)\} + T(Z)$, in which the term $W(Z) \{E(X \mid Y) - T(Z)\}$ is the original stockholder's cost of capital in the period. If the original stockholder had enough capital K, the firm's earnings would be $E(X \mid Y) - T(Z)$. But since he/she does not have K, the firm must pay a cost in terms of forsaken profit $W(Z) \{E(X \mid Y) - T(Z)\}$ to obtain K.

The disclosure $Z = Z(Y)$ will be fully revealing Y since there is a non-random correspondence between Z and Y. Hence, a needed assumption to avoid a Z that is fully revealing Y, is that the manager knows the functional form of the density $f(X \mid Y)$ over [a, b], while outsiders just know the set of possible densities $\{f_i(X \mid Y); i \in \{1, 2, ..., I\}\}$ over the real numbers. In this case, there are more than one source of uncertainty, and Z will be partially revealing Y (see e.g. Grinblatt and Hwang, 1989, for a similar approach).

By first assuming that the optimal disclosure $Z^* \in (a, b)$, i.e. Z^* does not lie on neither the lower nor the upper boundary, the first-order condition for determining the maximum value is

$$\{- W'(Z)\} \{E(X \mid Y) - T(Z)\} + \{1 - W(Z)\} \{- T'(Z)\} = 0,$$

or, by applying that $W(Z) = K / P(Z)$,

$$P'(Z) = A(Z) T'(Z),$$

where

$$A(Z) = \frac{P(Z)\{P(Z) - K\}}{K\{E(X \mid Y) - T(Z)\}} \geq 0.$$

If the optimal disclosure $Z^* \in (a, b)$ is not on one of the boundaries, it is determined by the manager so that the marginal increase in the firm's market value $P`(Z)$ equals the marginal increase in the firm's tax burden $T`(Z)$, multiplied by the non-negative adjustment factor $A(Z)$.

Lemma: If P'(Z) < A(Z) T'(Z), then Z* = a; if P'(Z) = A(Z) T'(Z), then Z* ∈ [a, b]; if P'(Z) > A(Z) T'(Z), then Z* = b.

If the market value of the firm P(Z) is very insensitive to the disclosed income Z, the manager would find it optimal to disclose the minimum income Z* = a; if the market value P(Z) is very sensitive to Z, he/she would find it optimal to disclose the maximum income Z* = b. Otherwise, the manager would disclose an income Z* lying between a and b.

Proposition 1: If the sensitivity of the market value P'(Z) to the disclosed income Z increases, the firm's optimal disclosure Z* increases; if the sensitivity of the tax T'(Z) to the disclosed income Z increases, Z* decreases.

The firm has an incentive both to overstate income Z > Y because it yields a lower cost of capital, and to understate income Z < Y because it yields a lower tax. As illustrated by Figure 1, the manager's choice of disclosure Z* weights both incentives of earnings manipulation such that the value of the current stockholder is maximized.

- INSERT FIGURE 1 HERE -

In the period, the cost of capital W(Z) {E(X | Y) - T(Z)} is a decreasing function of the disclosed income Z, whereas the tax T(Z) is an increasing function of Z. In the example illustrated in the figure, the manager chooses to understate income Z* < Y because the saved tax more than neutralizes the increased cost of external financing. If the tax T(Z) becomes less sensitive to the disclosed income Z, then the saved tax will be reduced, and it becomes optimal to disclose a higher income Z** > Z* to the stakeholders. At some point, it would become optimal to overstate income Z** > Y > Z*.

A potential criticism against the outlined model is that it does not highlight the intertemporal considerations of earnings manipulation. For instance, if the accrual options allow revenue to be reported in either of two periods, it would pay for the firm to distribute it over the two periods so that the present value of the cost of capital and the tax is minimized. Particularly, if the firm is going to issue new stocks in the first period but not in the second, then it would pay to inflate the disclosed income in the first period if the cost of capital is sensitive enough to the disclosed income.

4. SEPARATION

Suppose that taxation is based solely on taxable income Z_T, which is a separate signal that differs from accounting income Z_A. This means that the tax $T(Z_T) = t \cdot \max\{E(X \mid Z_T), 0\}$ and the market value of the firm $P(Z_A, Z_T) = E(X - T(Z_T) \mid Z_A, Z_T)$.

Proposition 2: If taxable income Z_T were separated from accounting income Z_A, then the firm's optimal reporting strategy is $Z_A^* \geq Y$ and $Z_T^* \leq Y$.

If the accounting income Z_A were separated from taxable income Z_T, the manager would rationally overstate the accounting income $Z_A^* \geq Y$ as it yields a lower cost of obtaining capital, and understate the taxable income $Z_T^* \leq Y$ as it yields a lower tax. Thus, the extent of income manipulation $|Z_A^* - Y| + |Z_T^* - Y|$ increases relative to $|Z^* - Y|$.

Since the manager will overstate the accounting income $Z_A^* \geq Y$, the capital market regulator, supposedly protecting the interests of external capital providers, must find adequate countermeasures. One approach is to impose stricter regulations on disclosure and combine these with comprehensive controls and heavy sanctions. The sanctions if the firm were to be accused, and perhaps convicted, of fraud would then become the mechanism replacing the increased tax. Similarly, since the manager will

understate the taxable income $Z_T^* \leq Y$, the tax authorities must find adequate coun-termeasures. One approach is to regulate how taxable income is calculated and utilize comprehensive controls and heavy sanctions. The sanctions if the firm were accused, and perhaps convicted, of tax evasion would then become the mechanism replacing the increased cost of capital. An alternative approach to comprehensive controls and heavy sanctions is to let the accounting and taxable income be closely linked by letting $Z_A = Z_T = Z$. In this way, there would be a self-controlled mechanism that, in a weak sense at least, would contribute to limit the need of separate regulation.

5. CONCLUDING REMARKS

We have shown that the capital market might play a disciplinary role in preventing understatements of income for the purpose of reducing the tax liability, and that taxation based on accounting income might play a disciplinary role by preventing overstatements of income for the purpose of reducing the cost of acquiring new capital. Accordingly, a separation of financial and tax accounting might distort these disciplinary effects. It is not possible, based on our analysis, to reach conclusions such that taxable income should be based on accounting income in general. To evaluate that question, a comprehensive cost-benefit analysis within a model de-signed for this purpose would have to be undertaken. Nevertheless, the disciplinary role of linking taxable income and accounting income is one argument that should be considered in such a comprehensive analysis. Of course, the outcome could still be that separation is desirable.

We have focused on the self-controlled mechanism that appears when the level of earnings manipulation is decided by the tradeoff between cheaper funding and higher tax. But since there are many motives for earnings manipulation (see e.g. Jiambalvo, 1996, and Healy and Wahlen, 1998), it is the sum of these motives that determines the level of distortion. More generally, an automatic safeguard against widespread manipulation could be the result of several balancing motives. But one of the motives

might be so strong that it tilts the balance. Then it would be a good idea to limit this motive so that the balance could be restored. For instance, if the incentive to understate income in order to save tax were very strong, it would indeed be a rationale for separating taxable and accounting income. Separation restores the balancing effect among the remaining motives. Accordingly, our analysis could also explain why there has been a shift from aligned to separate financial and tax reporting (see *European Accounting Review*, Supplement, 1996).

The link between accounting and taxation is tighter in most continental European countries than, for instance, in the United Kingdom and the United States (see e.g. Eilifsen, 1997). Financing through an organized stock market is more common, say, in the United States than in Germany. This implies that disclosure of relatively conservative accounting figures could be more tempting in Germany than in the United States, as it is more profitable to understate accounting income to save tax. Conversely, overstating accounting income to lower the cost of capital could be more tempting in the United States due to the weaker link between accounting and taxable income and to the relative importance of the stock market as a source of capital. Harris, Lang, and Möller (1994) analyze the relative value-relevance of German and American accounting measures. Their findings suggest that German accounting figures could be as informative to investors as American accounting figures (see also Joos and Lang, 1994). This result can be explained by the opposite incentives to manipulate earnings in the two countries, which accordingly might produce as distorted earnings estimates in the United States as in Germany. The findings of Harris, Lang, and Möller (and Joos and Lang) are challenged by the findings of Ali and Hwang (1996).

Recently, the link between financial accounting and taxation has been reduced in several countries, including some of the Nordic countries (see e.g. Flower, 1994). Such a development prescribes, according to our analysis, a change in the regulatory focus to prevent overstatement of accounting income and understatement of taxable

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income. For instance, the auditors of exchange listed firms and, indeed, various governmental watchdogs should meet the challenge for instance by using more resources and intensifying their surveillance both to protect investors from the firms' incentives to inflate disclosed income in order to reduce their funding costs, and to control the firms' accounts for possible tax evasion. Since many countries are in the process of scrapping integrated reporting for separate reporting for financial accounting and taxation purposes (and many countries, like the East-European countries, are still in the process of establishing new accounting and tax systems), this change of focus in regulation and control should be emphasized in order to reduce potential transmission problems.

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APPENDIX

Proof of the Lemma: We have shown that if $Z^* \in (a, b)$, the first-order condition is $P`(Z) - A(Z) T`(Z) = 0$, which means that the second-order condition is $P``(Z) - A`(Z) T`(Z) - A(Z) T``(Z) < 0$ and satisfied by assumption. If $P`(Z) - A(Z) T`(Z) < 0$ for all $Z \in [a, b]$, then $Z^* = a$ since the manager by reporting $Z > a$ yields less earnings to the current stockholder. If $P`(Z) - A(Z) T`(Z) > 0$ for all $Z \in [a, b]$, then $Z^* = b$ since the manager by reporting $Z < b$ yields less earnings to the current stockholder. This completes the proof of the Lemma.

Proof of Proposition 1: If $Z^* \in (a, b)$, the first-order condition is $P`(Z) - A(Z) T`(Z) = 0$. If $P`(Z)$ increases exogenously and $T`(Z)$ remains constant, then $A(Z)$ has to increase for the first-order condition to be satisfied. Since $A`(Z) \geq 0$ by straightforward calculations based on the expression of $A(Z)$ in Section 3, it follows that $Z$ has to increase. If $T`(Z)$ increases exogenously and $P`(Z)$ remains constant, then $A(Z)$ has to decrease for the first-order condition to be satisfied. Since $A`(Z) \geq 0$, then Z has to decrease. If, for instance, $P`(Z)$ increases when $P`(Z) - A(Z) T`(Z) > 0$, $Z^* = b$ is unchanged. Accordingly, the comparative effects only hold in the weak sense. This completes the proof of Proposition 1.

Proof of Proposition 2: The manager's problem is to maximize $\{1 - W(Z_A, Z_T)\}$ $\{E(X \mid Y) - T(Z_T)\}$ with respect to Z_A and Z_T. Straightforwardly, $Z_A^* = b$ and $Z_T^* =$

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a, which means that $Z_A^* \geq Y$, $Z_T^* \leq Y$, and $|Z_A^* - Y| + |Z_T^* - Y| \geq |Z^* - Y|$. Z_A^* and Z_T^* are informative because they provide information about $\{f_i(X \mid Y); i \in \{1, 2, ..., I\}\}$. This completes the proof of Proposition 2.

Costs

$W(Z) \{E(X \mid Y) - T(Z)\} + T(Z)$

$T(Z)$

$W(Z) \{E(X \mid Y) - T(Z)\}$

Z

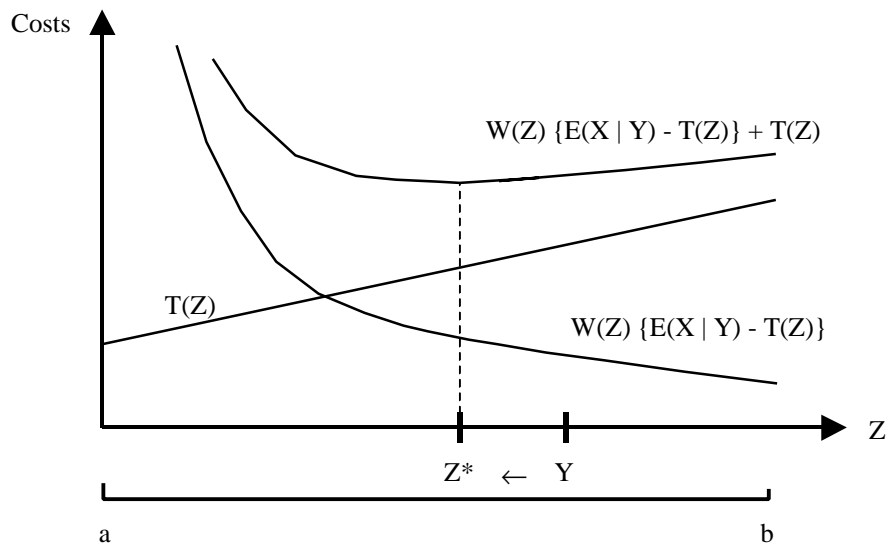$Z^* \quad \leftarrow \quad Y$

a

b

Figure 1. The tradeoff between the cost of acquiring new capital $W(Z) \{E(X \mid Y) - T(Z)\}$ and the tax $T(Z)$ determines the firm's optimal choice of disclosure policy Z^* in the period