

Chapter 2

Earnings Management: Origins

Abstract This chapter seeks to describe the field of inquiry by defining the concepts of earnings quality, earnings management, fraud, and earnings manipulation. It presents the earnings management phenomenon, specifically, from whence it comes. It reviews the mainstream studies, and focuses on two types of earnings management: accruals earnings management and real activities earnings management. In addition, studies related to fraudulent financial reporting (or non-generally accepted accounting principles, i.e. non-GAAP earnings management) will be presented and discussed as well. Furthermore, this chapter presents studies on managerial incentives for earnings management. The most important incentives (or causes) for managing earnings are discussed and the contradictory results provided by some of them highlighted. Finally, a few offsetting causes that may interfere with these main incentives for managing earnings are presented.

2.1 Introduction

This chapter presents the earnings management phenomenon, specifically, from whence it comes. It reviews the mainstream studies, defines the concepts of earnings quality, earnings management, fraud, and earnings manipulation, and focuses on two types of earnings management: accruals earnings management and real activities earnings management. Both accruals earnings management and real activities earnings management can cross the line from legitimate to fraudulent in specific situations. Therefore, studies related to fraudulent financial reporting, or non-generally accepted accounting principles (non-GAAP) earnings management, will be presented as well. Furthermore, this chapter presents studies on managerial incentives for earnings management. The most important incentives (or causes) for managing earnings are discussed since it is not clear whether these factors have the power to affect managers' earnings behaviors.

2.2 Definitions of Earnings Management, Earnings Quality, Fraud, and Earnings Manipulation

“Earnings management has a lot in common with earnings quality,” and clearly “most would agree that highly managed earnings have low quality” (Lo 2008, p. 351). In other words, earnings management affects earnings quality but the absence of earnings management is not sufficient to assure high-quality numbers (Lo 2008). Other mechanisms may contribute to the quality of earnings. Dichev et al. (2013) observed that research on earnings quality defines high-quality earnings as those that are persistent, derived under conservative accounting rules or reflect a conservative application of relevant rules, smooth, backed by cash flows, and accurately predict future earnings. High-quality earnings “provide more information about the features of a firm’s financial performance that are relevant to a specific decision made by a specific decision-maker” (Dechow et al. 2010, p. 344). However, Dichev et al. (2013) performed a large-scale survey of chief financial officers¹ (CFOs) and standard setters to provide new insights into the concept of earnings quality. Specifically, the interviewers asked CFOs to explain the concept of earnings quality. The results showed that a CFO’s idea of earnings quality relates to earnings that are sustainable and repeatable. Specific earnings behaviors that positively affect the quality of earnings include, among others, consistent reporting choices over time, avoiding unreliable long-term estimates as much as possible, and backing earnings with cash flows. High-quality earnings recur, are free from one-time items, reflect long-term trends, and have the highest chance of being repeated in future periods (Dichev et al. 2013). While there are other interpretations of earnings quality,² in the following discussion, high-quality earnings are not managed, while highly managed earnings are of low quality and, therefore, unreliable.

Earnings management can be defined as “the process of taking deliberate steps within the constraints of generally accepted accounting principles to bring about a desired level of reported earnings” (Davidson et al. 1987),³ as “a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain” (Schipper 1989, p. 92), or that which “occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers” (Healy and Wahlen 1999). The first definition relates to “artificial earnings management, which encompasses both changes in accounting methods and classificatory choice” (Beattie et al. 1994, p. 793). Regarding the last two definitions, (Dechow and Skinner 2000) argued that “although widely

¹As well as in-depth interviews of CFOs.

²Dechow et al. (2010) provide a comprehensive review of earnings quality studies.

³Davidson et al. (1987) has been cited by Schipper (1989).

accepted, these definitions are difficult to operationalize directly using attributes of reported accounting numbers since they center on managerial intent, which is unobservable” (p. 238). More recently, Giroux (2003) defined earnings management as “using operating and discretionary accounting methods to adjust earnings to a desired outcome” (p. 280).

Moreover, a clear definition of the term earnings management is difficult to identify in the practical literature as well. The Public Company Accounting Oversight Board (PCAOB) observed that “the term earnings management covers a wide variety of legitimate and illegitimate actions by management that affect an entity’s earnings” (2000, p. 77). Accordingly, “earnings management includes the whole spectrum, from conservative through fraud, a huge range for accounting choices” (Giroux 2006, p. 6). Dechow and Skinner (2000) distinguished between accounting choices that are fraudulent (e.g., recording sales before they are realized or realizable, recording fictitious sales, backdating sales invoices, and overstating inventory by recording fictitious inventory) and those that are conservative, neutral, and “aggressive, but acceptable, ways in which managers can exercise their discretion” (p. 239). However, management perspectives on accounting issues can be conservative and neutral, suggesting transparency, as well as more aggressive or even fraudulent (Giroux 2006), but “determining whether or when the behavior in the earnings management continuum crosses the line from legitimacy to fraud in a specific situation is not always easy” (PCAOB 2000, p. 79).

Rezaee (2005) defined financial statement fraud as a “deliberate attempt by corporations to deceive or mislead users of published financial statements, especially investors and creditors, by preparing and disseminating materially misstated financial statements” (p. 279). He posited that financial statement fraud may involve many schemes, such as

(1) falsification, alteration, or manipulation of material financial records, supporting documents, or business transactions; (2) material intentional misstatements, omissions, or misrepresentations of events, transactions, accounts or other significant information from which financial statements are prepared; (3) deliberate misapplication, intentional misinterpretation, and wrongful execution of accounting standards, principles, policies and methods used to measure, recognize, and report economic events and business transactions; (4) intentional omissions and disclosures or presentation of inadequate disclosures regarding accounting standards, principles, practices, and related financial information; (5) the use of aggressive accounting techniques through illegitimate earnings management; and (6) manipulation of accounting practices under the existing rules-based accounting standards (Rezaee 2005, p. 279).

Golden et al. (2006) also highlighted the characteristics of financial statement fraud, considering it to be marked by intentional misstatements or omissions in financial reporting to deceive financial statement users. More specifically, financial statement fraud involves: (a) manipulation, falsification, or alteration of accounting records; (b) manipulation, falsification, or alteration of supporting documents from which financial statements are prepared; and (c) the intentional misapplication of accounting principles to manipulate results (Golden et al. 2006, p. 5). In general, the

statement on accounting standards no. 99 defined fraud as “an intentional act that results in a material misstatement in financial statements.” The international standard on auditing no. 240 defined fraud as “an intentional act by one or more individuals among management, those charged with governance, employees, or third parties, involving the use of deception to obtain an unjust or illegal advantage.” Finally, the Association of Certified Fraud Examiners (ACFE) defined financial statement fraud as “the deliberate misrepresentation of the financial condition of an enterprise accomplished through the intentional misstatement or omission of amounts or disclosures in the financial statements to deceive financial statement users” (ACFE 2011, Section 1, 1.303).

Another term often used in earnings management literature is earnings manipulation, which Beneish (1999a) defined as an “instance in which a company’s managers violate generally accepted accounting principles (GAAP) to favorably represent the company’s financial performance” (p. 24). Giroux (2003) defined earnings manipulation—an aggressive earnings management practice—as “the opportunistic use of earnings management to effectively misstate earnings to benefit managers” (p. 280). Earnings manipulation (or fraud) is at the illegal end of the continuum, where someone clearly violates generally accepted accounting principles (GAAPs).

Herein, earnings management is considered “a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain” (Schipper 1989, p. 92), and although fraud can be interpreted more broadly than just a violation of GAAPs, for the purposes of this study, the concepts of fraud and earnings manipulation, as part of earnings management practices, are synonymous since they are both on the illegal end of the spectrum of accounting choices.

2.3 Accruals Earnings Management, Real Activities Earnings Management, and Fraudulent Financial Reporting

Dechow (1994) observed that “earnings are the summary measure of firm performance produced under the accrual basis of accounting” (p. 4). Reported earnings in the financial statement consist of cash earnings and non-cash earnings. Cash flow from operations is a measure of cash earnings while accruals are non-cash earnings. Accruals are accounting adjustments with no direct cash flow consequences created when revenues and expenses are not entirely cash based. Therefore, earnings are the aggregate of cash flow from operations and total accruals. The following basic accounting equation describes earnings (Hribar and Collins 2002):

$$E = CFO + TACC \quad (2.1)$$

where E is reported earnings, $TACC$ is total accruals, and CFO is cash flow from operations.

Equation 2.1 shows the components of earnings. One soon realizes that managers can manipulate both, either individually or jointly, to reach a specific earnings target. An increase (decrease) either in accruals or in cash flows accompanies an increase (decrease) in reported income. Accordingly, accounting researchers have traditionally focused on two types of earnings management: accruals earnings management and real activities earnings management. Accruals “modify the timing of reported earnings” (Healy 1985, p. 89); or, to put it the other way round, they “alter the timing of cash flows recognition in earnings” (Dechow 1994, p. 4). However, “one means of managing earnings is by manipulation of accruals with no direct cash flow consequences” (Roychowdhury 2006, p. 336), hereafter referred to as accruals earnings management, as opposed to real activities earnings management affecting cash flows. While accrual earnings management refers to the manipulation of earnings through the exploitation of an opportunity set of generally accepted procedures defined by accounting standards (Healy 1985), real earnings management is “accomplished by timing investment or financing decisions to alter reported earnings or some subset of it” (Schipper 1989, p. 92). For instance, changing the depreciation rate of assets, (delaying) asset write-offs, or (under) provisioning for bad debt expenses may underlie non-cash income-increasing/decreasing strategies.

On the other hand, real activities earnings management refers to “management actions that deviate from normal business practices, undertaken with the primary objective of meeting certain earnings thresholds” (Roychowdhury 2006, p. 336). Usually business decisions about expenditures on research and development, offering price discounts, changes in credit policy, and about (intensifying or cutting) other discretionary expenditures may underlie cash income-increasing/decreasing strategies.

Real activities earnings management is harder to detect than accruals earnings management since “there is no benchmark to determine what should have been done under any particular situation” (Lo 2008, p. 353). Furthermore, in some countries, managers are not liable for honest mistakes or errors of judgment; they are protected by business judgment rules or similar procedures meant to limit their responsibility. A business judgment rule “basically states that if any rational business purpose exists for directors’ or officers’ decisions, they are not liable for errors in judgment when their decisions result in an unfavorable outcome for the corporation” (McMurray 1987, p. 614). In contrast, accruals manipulation and other earnings behavior are subject to the examination of several actors (e.g., auditors, forensic accountants, and the courts) (Lo 2008). However, this does not mean that accruals earnings management is easy to detect. “The more sophisticated the manager, the less likely it is that he or she will engage in easy-to-detect earnings management, and the more elaborate will be the plans for concealment to evade detection” (Lo 2008, p. 352). Section 2.3.1 introduces accruals earnings management studies while Sect. 2.3.2 presents studies related to real activities earnings management.

Fraud is not self-contained; therefore it cannot be considered a third category of earnings management. Nevertheless, “earnings management is the most common method of engaging in financial statement fraud” (Rezaee 2005, p. 282). Depending on the magnitude of the misstatement (Rosner 2003), both accruals earnings management and real activities earnings management can cross the line from legitimate to fraudulent accounting behavior in specific situations. Fraudulent reasons for transacting with affiliate entities also exist; i.e., related parties’ transactions may be for deceptive or fraudulent purposes rather than genuine business purposes (Gordon et al. 2007).

A related party is a person or entity that is related to the entity that is preparing its financial statements.⁴ A related party transaction is a transfer of resources, services, or obligations between a reporting entity and a related party, regardless of whether a fee is charged (International Accounting Standards No. 24 [IAS No. 24]).⁵ Similarly, the Statement of Financial Accounting Standards No. 57 (FAS No. 57) states that transactions between related parties are considered to be related party transactions even though they may not be given accounting recognition (e.g., an enterprise may receive services from a related party without charge and not record receipt of the services). Related party transactions are real activities that may not have an impact on cash flows and are therefore slightly different from real earnings management activities.

⁴“Unlike economic transactions with an unrelated counterparty, in related party transactions, the same individual is on both sides of the transaction” (Gordon et al. 2007, p. 96).

⁵IAS No. 24 defines a related party as a person or entity that is related to the entity that is preparing its financial statements (in this Standard it is referred to as the ‘reporting entity’). (a) A person or a close member of that person’s family is related to a reporting entity if that person: (i) has control or joint control over the reporting entity; (ii) has significant influence over the reporting entity; or (iii) is a member of the key management personnel of the reporting entity or of a parent of the reporting entity. (b) An entity is related to a reporting entity if any of the following conditions apply: (i) the entity and the reporting entity are members of the same group (which means that each parent, subsidiary, and fellow subsidiary is related to the others); (ii) one entity is an associate or joint venture of the other entity (or an associate or joint venture of a member of a group of which the other entity is a member); (iii) both entities are joint ventures of the same third party; (iv) one entity is a joint venture of a third entity and the other entity is an associate of the third entity; (v) the entity is a post-employment benefit plan for the benefit of employees of either the reporting entity or an entity related to the reporting entity. If the reporting entity is itself such a plan, the sponsoring employers are also related to the reporting entity; (vi) the entity is controlled or jointly controlled by a person identified in (a); (vii) a person identified in [a(i)] has significant influence over the entity or is a member of the key management personnel of the entity (or of a parent of the entity); (viii) the entity, or any member of a group of which it is part, provides key management personnel services to the reporting entity or to the parent of the reporting entity. The Statement of Financial Accounting Standards No. 57 (FAS No. 57) defines related party transactions as transactions between (a) a parent company and its subsidiaries; (b) subsidiaries of a common parent; (c) an enterprise and trusts for the benefit of employees, such as pension and profit-sharing trusts that are managed by or under the trusteeship of the enterprise’s management; (d) an enterprise and its principal owners, management, or members of their immediate families; and (e) affiliates.

Other accounting behaviors such as recording sales before they are realized or realizable, recording fictitious sales, backdating sales invoices, overstating inventory by recording fictitious inventory, etc., are fraudulent per se.⁶

Fraudulent financial reporting, fraudulent accounting, GAAP violations, non-GAAP earnings management, earnings misstatement, earnings manipulation, or simply fraud, are all used as synonyms herein. However, since financial fraud is an area that has been somewhat neglected in the earnings management (quality) literature (DeFond 2010, p. 406), I decided to include a specific Sect. 2.3.3 on studies of financial statements fraud as well.

2.3.1 Studies Related to Accruals Earnings Management

Managers exercise their discretion to estimate numerous future events such as “expected lives and salvage values of long-term assets, obligations for pension benefits and other post-employment benefits, deferred taxes and losses from bad debts and asset impairments” (Healy and Wahlen 1999, p. 369). Additionally, managers must also choose among accepted procedures defined by accounting standards for reporting the same economic transaction (Healy and Wahlen 1999). For instance, under IAS 16, the depreciable amount of an asset shall be mandatorily allocated on a systematic basis over its useful life but a variety of depreciation methods can be used to allocate the depreciable amount. These methods include the straight-line method, the diminishing balance method and the units of production method. Similarly, to determine the cost of inventories for items that are interchangeable, IAS 2 prescribes either the first-in, first-out (FIFO), or the weighted average cost formula.

Generally accepted accounting principles often require that discretion be exercised in the financial reporting process (e.g., exercising judgment in determining the amount of accounts receivable that are likely to be collected, the appropriate allocation pattern for the cost of equipment, or how long a marketable security is likely to be held, etc.) (Fields et al. 2001). However, accounting discretion may open the door to opportunistic earnings behavior. Managers might manipulate earnings through the exploitation of an opportunity set of generally accepted procedures defined by an accounting standard (Healy 1985). Such opportunistic behavior affects earnings, making them a “less reliable measure of firm performance” (Dechow 1994, p. 5) or a distorted measure of firm performance (Kothari 2001). Specifically, self-interested managers might use accounting discretion to opportunistically manipulate accruals (Kothari 2001).

⁶Account schemes through which management commits fraud by manipulating financial statements are (among others): overvalued assets and understated expenses; omitted or understated expenses/liabilities; fictitious assets; other methods to overstate revenues; overvalued assets/equity; and misclassification (Gao and Srivastava 2007).

As shown in Sect. 2.3, Eq. 2.1, earnings are calculated by summing the cash flow from operations and total accruals. Therefore, the difference between earnings and cash flows corresponds to the total accrual portion of earnings. Indeed, Healy (1985) defined accruals “as the difference between reported earnings and cash flows from operations” (p. 86), as illustrated by the following equation:

$$TACC = E - CFO \quad (2.2)$$

where E is reported earnings, $TACC$ is total accruals, and CFO is cash flows from operations.

Dechow et al. (2010) correctly observed that the definition of accruals has changed over time; particularly since cash flow statements have been formally required under GAAPs.⁷ Specifically, research done prior to the mandatory reporting of the cash flow statements had to extrapolate cash flows from other statements, such as the statement of working capital or the balance sheet. For instance, Healy (1985) defined cash flows as “working capital from operations (reported in the funds statement) less changes in inventory and receivables, plus changes in payables and income taxes payable” (p. 94). Therefore, measuring total accruals required an additional effort.

Rather than compute total accruals by subtracting cash flow from operations from reported earnings, prior research represented total accruals by approximate measures mainly based on balance sheet variables. According to Bartov et al. (2001) prior literature (e.g., Dechow et al. 1995; Healy 1985; Jones 1991; among others) calculated total accruals ($TACC_{i,t}$) for firm i in year t using the so-called balance sheet approach:

$$TACC_{i,t} = \Delta CA_{i,t} - \Delta Cash_{i,t} - \Delta CL_{i,t} + \Delta DCL_{i,t} - DEP_{i,t} \quad (2.3)$$

where $\Delta CA_{i,t}$ is the change in current assets of firm i in year t ; $\Delta Cash_{i,t}$ is the change in cash and cash equivalents of firm i in year t ; $\Delta CL_{i,t}$ is the change in current liabilities of firm i in year t ; $\Delta DCL_{i,t}$ is the change in debt included in current liabilities (i.e., current maturities of long-term debt) in firm i in year t ; and $DEP_{i,t}$ is the depreciation and amortization expense of firm i in year t . Changes (Δ) are computed between time t and $t - 1$.

However dated, Healy’s (1985) definition of accruals is still valid because “since the introduction of the statement of cash flows, accruals are more often defined as the difference between earnings and cash flows where cash flows are obtained from the statement of cash flows” (Dechow et al. 2010, p. 352). Accordingly, most subsequent studies, as suggested by Hribar and Collins (2002), measured total

⁷For example, under US GAAPs, the Statement of Financial Accounting Standards No. 95 (FAS No. 95) issued in 1987 became effective for the annual financial statements of fiscal years ending after July 15, 1988. While in 1992, the International Accounting Standards Board issued International Accounting Standard No. 7 (IAS No. 7), which became effective only in 1994, mandating that firms provide cash flow statements.

accruals (TACC) using the so-called cash flow approach, as the difference between earnings before extraordinary items (EBXI) and cash flows from operations (CFO) from continuing operations were obtained directly from the statement of cash flows.⁸ Symbolically:

$$TACC_{i,t} = EBXI_{i,t} - CFO_{i,t} \quad (2.4)$$

where i, t are firm and time subscripts.

Finally, to reduce heteroscedasticity and to allow for comparisons across firms, total (or aggregate) accrual measures are typically scaled by total assets (TA) from the previous fiscal year (TA_{t-1}) (Thomas and Zhang 2000, p. 352).

Further, in his seminal article, Healy (1985) distinguished accruals into non-discretionary and discretionary.⁹ Therefore, total accruals in a given period consist of discretionary accruals and non-discretionary accruals:

$$TACC = DACC + NDACC \quad (2.5)$$

where TACC is total accruals, DACC is discretionary accruals, and NDACC is non-discretionary accruals.

While non-discretionary accruals are accounting adjustments mandated by the accounting standard setters,¹⁰ discretionary accruals are adjustments selected by the managers.¹¹ The latter portion of accruals “serves as a proxy for earnings

⁸Hribar and Collins (2002) took both components of accruals directly from the statement of cash flows. Specifically, they took the following data items from the Compustat database: Compustat #123 to determine earnings before extraordinary items; and to determine cash flows from operations (CFO), they subtracted from net cash flow (Compustat #308) the amount of extraordinary items and discontinued operations (Compustat #124).

⁹In a subsequent article, Healy (1996) changed the terminology and stated: “I regret that I bear much of the responsibility for the current labels, which I first used in my bonus plan paper (Healy 1985). If I were to rewrite that paper today, I would certainly change the terminology. What I termed ‘discretionary’ accruals would be renamed ‘unexpected’ accruals and what I called ‘nondiscretionary’ earnings would be relabeled as ‘expected’ earnings” (p. 114). The perspective has changed; the main point is not to detect earnings management but to forecast accruals. However, following conventional practice (Peasnell et al. 2000), I use the terms “managed accruals,” “discretionary accruals,” “unexpected,” and “abnormal accruals” interchangeably. Similarly, the terms “unmanaged accruals,” “non-discretionary accruals,” “expected,” and “normal accruals” are used interchangeably.

¹⁰Healy (1985) specified: “These bodies require, for example, that companies depreciate long-lived assets in some systematic manner, value inventories using the lower of cost or market rule, and value obligations on financing leases at the present value of the lease payments” (p. 89).

¹¹As Healy (1985) pointed out, “the manager chooses discretionary accruals from an opportunity set of generally accepted procedures defined by accounting standard-setting bodies. For example, the manager can choose the method of depreciating long-lived assets; he can accelerate or delay delivery of inventory at the end of the fiscal year; and he can allocate fixed factory overheads between cost of goods sold and inventories” (p. 89).

management” (Kothari 2001, p. 161). The discretionary component of accruals reflects management accounting choices. Indeed, discretionary accruals and earnings management are frequently used as synonyms in the literature (Kothari 2001).

The majority of studies have used aggregate or total accruals (see following Sect. 2.3.1.1) to proxy for accrual earnings management (e.g., DeAngelo 1986; DeFond and Jiambalvo 1994; DeFond and Subramanyam 1998; Healy 1985; Holthausen et al. 1995; Jones 1991; Shivakumar 2000; Subramanyam 1996; etc.).

Healy (1985) and DeAngelo Jones (1986) used total (or aggregate) accruals and changes in total accruals, respectively, as measures of management’s discretion over earnings, while Jones (1991) introduced a regression approach to control for non-discretionary factors influencing accruals (McNichols 2000). Many studies have adopted the Jones (1991) model and/or subsequent versions of it (e.g., Dechow et al. 1995; Guay et al. 1996; Kothari et al. 2005; etc.) to detect earnings management. Appendix presents Healy’s (1985), DeAngelo’s (1986), Jones’ (1991), Dechow et al.’s (1995), and Kothari et al.’s (2005) models to measure the discretionary portion of total accruals. Although some researchers employ multiple methods, the Jones (1991) model and the modified Jones model (Dechow et al. 1995) clearly represent the most frequently consolidated models used in a substantial proportion of the literature.

Despite the widespread use of total or aggregate accruals to predict residual discretionary accruals,¹² a number of studies direct their attention to specific accruals (e.g., Dhaliwal et al. 2004; Marquardt and Wiedman 2004; McNichols and Wilson 1988; Schrand and Wong 2003; Teoh et al. 1998b; etc.). These studies focus on the discretionary portion of a single accrual account or on a number of individual accruals (see Sect. 2.3.1.2) that might be used by managers to reach their goals (e.g., accounts receivable, special items, allowance for bad debts, depreciation estimates, etc.). Appendix presents Marquardt and Wiedman’s (2004) specific accruals measures. However, “if the discretionary accrual measure represents a small part of the total discretionary component of income, it can fail to reflect earnings management in situations where other discretionary components (besides the one examined) are manipulated” (McNichols and Wilson 1988, pp. 2–3).

Comprehensiveness is a characteristic of the broad measures of earnings management, i.e., total accruals. Indeed, the sum of all specific accruals should approximate the comprehensive aggregate accruals’ value. Broad measures of earnings management have the power to capture managers’ exercised discretion in

¹²Healy and Wahlen (1999) explained: “many studies begin with total accruals, measured as the difference between reported net income and cash flows from operations. Total accruals are then regressed on variables that are proxies for normal accruals, such as revenues (or cash collections from customers) to allow for typical working capital needs (such as receivables, inventory, and trade credit), and gross fixed assets to allow for normal depreciation. Unexpected accruals are thus the unexplained (i.e., the residual) components of total accruals” (p. 370).

its entirety, “whereas specific accruals may represent only a small portion of the discretionary component of income and therefore may fail to reflect earnings management in particular instances” (Marquardt and Wiedman 2004, p. 464).

In summary, two main approaches have been adopted in prior research to capture managers’ accounting discretion in managing accruals. The first approach studies total or aggregate accruals whereas the second approach focuses on the specific accruals that are likely to be managed in contingent circumstances.

2.3.1.1 Total Accrual Earnings Management: An Overview of Related Studies

Prior research relied on total (aggregate) or unexpected accruals to detect the presence of earnings management rather than use specific accruals. Healy (1985) used discretionary accruals and voluntary changes in accounting procedures to detect earnings management. He examined whether bonus schemes create incentives for managers to select accounting procedures and accruals to maximize the value of their bonuses. The results provided evidence of a strong association between accruals and managers’ income-reporting incentives under their bonus contracts. Healy (1985) concluded that managers choose to understate earnings when the upper or lower limits of their bonus plans are binding, and overstate earnings when these limits are not binding. Consistently, Guidry et al. (1999) examined whether business-unit managers manage earnings to maximize their short-term bonuses. The results showed that business-unit managers make discretionary accrual decisions to maximize their short-term bonus compensation.

Similarly, Holthausen et al. (1995) reported evidence consistent with the hypothesis that managers manipulate earnings downwards when their bonuses are at their maximum. Specifically, Holthausen et al. (1995) suggested that managers use income-decreasing discretionary accruals when they are at the upper limit of their bonus contract, whereas “no convincing evidence of downward manipulation at the lower bound” (p. 65) has been found.

On the other hand, Gaver et al.’s (1995) results were inconsistent with Healy’s (1985) bonus-maximization hypothesis. Healy (1985) suggested that when the limits of the bonus plan’s upper maximum have been largely met, deferring income that exceeds the upper bound does not reduce the current bonus but instead increases the manager’s expected future award. Meanwhile, if current earnings are so low that target earnings will not be met, managers have incentives to further decrease earnings to maximize the expected future bonus. By contrast, Gaver et al. (1995) found that when earnings fall below the lower limit, managers select income-increasing discretionary accruals (and vice versa). In short, their results are

inconsistent with the “big bath” argument (Walsh et al. 1991)¹³ and are instead more evocative of income-smoothing behavior (Bartov 1993).¹⁴

Firms use discretionary accounting choices to manage earnings around the time of certain types of corporate events as well (DuCharme et al. 2004). For example, DeAngelo (1986) investigated the accounting decisions made by managers of listed companies who proposed a management buyout. Her final sample consisted of 64 firms whose managers proposed going private. Management buyouts “engender potentially severe managerial conflicts of interest because managers who have a fiduciary duty to negotiate fair value for the publicly-held shares are themselves the purchasers of those shares, and thus have a countervailing incentive to minimize the compensation paid” (DeAngelo 1986, p. 418). However, she strongly rejected the hypothesis that managers who propose to take a public corporation private understate that corporation’s earnings before the management buyout. By contrast, the results of Perry and Williams (1994) showed that managers manipulate discretionary accruals downward in the year preceding the public announcement of management’s intention to go private, presumably to lower the share price.¹⁵

Jones (1991) found that managers manage earnings during import relief investigations by the United States International Trade Commission. Specifically, the results showed that companies seeking import relief exercised income-decreasing discretionary accruals during the import relief investigations. However, other forms of regulation and potential regulatory scrutiny can provide firms with incentives to manage earnings (Healy and Wahlen 1999). For example, Cahan (1992) investigated the earnings behavior of managers of firms subject to antitrust investigations. The results showed that firms under investigation for monopoly-related violations reported income-decreasing abnormal accruals in investigation years. Hall (1993) examined whether oil firms respond to changes in gasoline prices with earnings management techniques to reduce the probability of cost-increasing legislation (i.e., price regulation, higher taxes, and other costs related to the industry). The findings of the latter study suggested that oil firms manage accruals to decrease earnings in periods when gasoline prices are rising to mask excessively high accounting rates of

¹³Big bath accounting is a managerial stratagem (Walsh et al. 1991) based on the assumptions that “when circumstances are bad, making things just a little bit worse by cleaning out the rubbish does little harm to either reputation or prospects” and that “little damage will ensue when the market is so depressed that nothing can hurt it more” (Walsh et al. 1991, p. 174).

¹⁴Under the income-smoothing hypothesis, “earnings are manipulated to reduce fluctuations around some level that is considered normal for the firm” (Bartov 1993, p. 840). Income smoothing is an earnings management technique and is defined as follows: “Income smoothing is the process of manipulating the time profile of earnings or earnings reports to make the reported income stream less variable, [...]. To smooth income, a manager takes actions that increase reported income when income is low and takes actions that decrease reported income when income is relatively high; this latter aspect is what differentiates income smoothing from the related process of trying to exaggerate earnings in all states” (Fudenberg and Tirole 1995, pp. 75–76).

¹⁵Perry and Williams (1994) argued that the principal reason for such contrasting results is sample size. Compared to the DeAngelo (1986) study, Perry and Williams (1994) examined a much larger sample of firms going private (175 management buyout proposals).

return. Similarly, Byard et al. (2007) investigated the managers' earnings behavior of US-based oil companies facing heightened political scrutiny due to increased profits after the impact of Hurricanes Katrina and Rita.¹⁶ Their results showed that large petroleum refining firms used negative discretionary accruals to adjust earnings in the hopes of avoiding potential political cost-related increases. Key (1997) investigated the earnings behavior of cable television managers surrounding the regulation of the cable television industry. Her evidence was consistent with firm managers increasing negative discretionary accruals during the period of scrutiny to mitigate the effects of political scrutiny and potential regulation. Finally, Chen et al. (2011) examined the earnings behavior of a sample of Chinese real estate firms after the boom of the Chinese real estate sector in 2001. The rapid growth of the Chinese real estate sector placed significant upward pressure on prices while engendering huge profits for real estate companies. As a consequence, Chinese authorities promulgated several acts to regulate the real estate industry (Chen et al. 2011). However, Chen et al.'s (2011) results showed that real estate companies responded with income-decreasing strategies "to increasingly tight macroeconomic controls" (p. 92).

DeFond and Jambalvo (1994) found evidence consistent with earnings manipulation by firms that violate debt covenants. Their results are consistent with a well-established hypothesis in the accounting literature: i.e., managers make income-increasing accounting decisions when their firms are close to debt covenant violation. Specifically, by investigating a sample of 94 firms that reported debt covenant violation, the authors found substantial evidence of income-increasing discretionary accruals in the year prior to covenant violation. Therefore, supporting the "conventional view that debt agreements motivate managers to manipulate income" (DeFond and Jambalvo 1994, p. 146). On the other hand, DeAngelo et al. (1994) found that accounting decisions made by managers of financially distressed companies "primarily reflect recognition of their firms' financial difficulties, rather than systematic attempts to inflate income to avoid debt covenant violations or to otherwise portray the firm as less troubled" (p. 140). In this latter study, troubled firms exhibit large negative accruals.

Earnings management activity seems particularly plausible around seasoned equity offerings (SEOs) as well. Rangan (1998), Teoh et al. (1998a), Shivakumar (2000), DuCharme et al. (2004), and Cohen and Zarowin (2010) showed that SEO firms engage in earnings management around the time of the issuance of new stock. These studies found that SEO firms present positive abnormal accruals (i.e., upwardly managed earnings) during the year around the SEO, perhaps to increase

¹⁶"Hurricanes Katrina and Rita caused widespread disruption to the US-based oil industry and were followed by large price increases for both crude oil and gasoline. These large price increases triggered a widespread public outcry that companies in the oil industry were engaged in price gouging. Various proposals were floated for investigations, regulations, and a windfall profits tax specifically aimed at companies in the oil industry. If passed, these proposals could have imposed large additional costs on these companies, thus adversely affecting their future profitability" (Byard et al. 2007, p. 734).

the offering proceeds,¹⁷ and that these accruals subsequently reverse in the following year, causing declines in earnings.

However, earnings management surrounding seasoned bond offerings (SBOs) seems to also be plausible. Indeed, managers may manipulate earnings before issuing bonds to achieve a lower cost of borrowing, or more in general, to improve the terms of the offering. Liu et al. (2010) investigated whether firms manage earnings before issuing bonds to achieve a lower cost of borrowing. Their results showed significant income-increasing earnings management prior to bond offerings. Similarly, Caton et al. (2011) found that bond issuers tend to manage earnings upward prior to the offering. After the offering, however, earnings management efforts decline significantly (Caton et al. 2011). Both studies found positive and significant discretionary accruals prior to bond issues. Like firms issuing bonds to improve the terms of the offering, firms issuing convertible bonds have incentives to manage earnings. Convertible bonds give creditors the opportunity to convert their bonds into stocks, and give firms the opportunity to avoid cash pressures due to debt repayment. Therefore, issuing firms may have an incentive to manage earnings in order to attract creditors to exercise the conversion option. Chang et al. (2010) examined whether companies engage in earnings management during the specific years when convertible bonds are issued and redeemed. Their results demonstrated that convertible bonds issuers generally use positive discretionary accruals in the issuing year to promote their convertible bonds and to reduce the costs of issuance. Furthermore, results indicate that the magnitude of earnings management is higher in the year following the issue of convertible bonds than in the year before the issue probably “to influence creditors’ willingness to convert their bonds into stocks through earnings management” (Chang et al. 2010, p. 83). Finally, Chang et al. (2010) showed that the magnitude of earnings management “is higher in the year convertible bonds are redeemed than in the year after redeeming” (p. 83).

Proxy contests for board seats may incentivize incumbent managers to manipulate earnings as well. DeAngelo (1988) provided evidence that incumbent managers typically increase earnings via positive discretionary accruals during an election campaign to paint a favorable picture of their own performance. However, if management changes and dissident managers are elected, new managers “tend to take an immediate earnings ‘bath’ which they typically blame on the poor decisions of prior management and which enables them to report an earnings ‘turnaround’ the following year” (DeAngelo 1988, p. 34). Similarly, DeFond and Subramanyam (1998) investigated the behavior of discretionary accruals in a sample of auditor change firms. Among other causes, auditor changes can occur when managers and auditors hold legitimate divergent perspectives regarding the appropriate application of accounting procedures. However, managers may threaten to dismiss auditors if their accounting views are not accepted (Antle and Nalebuff 1991). Specifically,

¹⁷Issuing companies manage earnings upward through income-increasing accounting adjustments in order to increase the offering proceeds. However, the high earnings reported around SEOs temporarily overvalue issuing firms until the subsequent fiscal period in which discretionary accruals reverse.

DeFond and Subramanyam (1998) observed that “if management believes the incumbent auditors accounting choice preferences are more conservative than those expected from the average auditor, management has an incentive to dismiss the incumbent auditor in hopes of finding a more reasonable successor” (p. 36). Consistently, DeFond and Subramanyam’s (1998) results provided evidence of larger negative discretionary accruals during an auditor’s last year than in the first year with their successor.

Earnings forecasts may also create an incentive to manage earnings. Some studies have shown that earnings are managed to meet the expectations of managers (e.g., Kasznik 1999), financial analysts (e.g., Bartov et al. 2002; Bhojraj et al. 2009; Burgstahler and Eames 2006; Cheng and Warfield 2005; Kasznik and McNichols 2002; Kinney et al. 2002; Matsumoto 2002), and other stakeholders (e.g., Chung et al. 2002; Hsu and Koh 2005; Koh 2003, 2007). However, analysts’ stock recommendations (e.g., buy, hold, or sell) may create an incentive to manage earnings as well (e.g., Abarbanell and Lehavy 2003).

Kasznik (1999) found that managers who issue annual earnings forecasts manage reported earnings toward their forecasts. In particular, the results provided evidence consistent with his “prediction that managers use positive discretionary accruals to manage reported earnings upward when earnings would otherwise fall below management’s earnings forecasts” (Kasznik 1999, p. 79). Public forecasts of firms’ earnings generally represent an incentive to manage earnings because even small negative earnings surprises¹⁸ (i.e., due to a failure to meet or beat analysts’ expectations) are accompanied by large negative returns (Kinney et al. 2002). Moreover, investors reward firms whose earnings meet or beat analysts’ earnings forecasts. Firms that meet/beat their earnings expectations enjoy a higher return than their peers that fail to do the same (Bartov et al. 2002). Further, the market assigns a greater value to habitual beaters¹⁹ (Bartov et al. 2002), i.e., firms that repeatedly meet/beat analysts’ expectations (Kasznik and McNichols 2002). Therefore, managers place great importance on meeting or exceeding analysts’ expectations to avoid declines in stock prices (Kinney et al. 2002).

Matsumoto (2002) suggested that managers use two mechanisms to avoid negative earnings surprises: earnings management and forecast guidance (or forecast management). Specifically, managers can use their accounting discretion to meet analysts’ earnings expectations, and/or guide analysts’ earnings forecasts downward to improve their firm’s chances of meeting or beating the forecast. Overall, the results of this latter study suggest that “both mechanisms play a role in avoiding negative earnings surprises” (Matsumoto 2002, p. 485). Consistent with Matsumoto, Burgstahler and Eames (2006) provided evidence that earnings are

¹⁸The difference between the current earnings and analysts’ forecast earnings is called “earnings surprise” (Kinney et al. 2002, p. 1299).

¹⁹Bartov et al. (2002) defined habitual beaters as firms that have met or beaten expectations in at least 9 (75%) of the previous 12 (100%) quarterly earnings forecasts.

managed²⁰ upward and forecasts are managed downward to achieve zero (i.e., to meet analyst forecasts) and small positive (i.e., to slightly beat analyst forecasts) earnings surprises.

Kross et al. (2011) found that firms that consistently meet or beat analysts' earnings expectations provide more frequent "bad news" management forecasts than those that non-habitually meet/beat expectations. Kross et al. (2011) suggested that the strategic behavior of providing "bad news" management forecasts is an attempt to guide analysts' expectations downward, thereby making it easier for those that habitually meet/beat expectations to meet/beat future analysts' earnings forecasts. However, their results also suggest that analysts discount the credibility of bad news management forecasts when revising their forecasts; i.e., analyst forecast revisions are weaker in response to bad news provided by habitual than non-habitual meet/beaters.

Bhojraj et al. (2009) found that firms using discretionary accruals or cuts in discretionary expenses (i.e., low-earnings quality firm) to beat analysts' earnings forecasts have in a short-term horizon "stock returns that are equal to or marginally better than firms that miss their forecast but maintain high quality earnings" (p. 2363). However, in the long run, firms that beat expectations with low-quality earnings underperform firms with high-quality earnings that fail to beat forecasts (Bhojraj et al. 2009).

From another perspective, Cheng and Warfield (2005) examined the association between managers' equity incentives (arising from stock-based compensation and stock ownership) and earnings management. They found that managers with high-equity incentives, relative to managers with low-equity incentives, are more likely to engage in earnings management²¹ and report earnings that meet or just beat analysts' forecasts.

Finally, Yu (2008) considered whether analyst coverage affects firms' earnings management behaviors and whether firms with different coverage demonstrate different propensities to meet or beat analysts' earnings forecasts. The results showed that firms with analyst coverage have a lower level of discretionary accruals than firms with no coverage, and that firms with high analyst coverage, i.e., companies that are followed by more analysts, "are more likely to narrowly miss the earnings target" (Yu 2008, p. 266). Finally, he argued that analysis undertaken by top brokerage houses or by experienced analysts have stronger effects against earnings management.

²⁰Burgstahler and Eames (2006) "view earnings management as encompassing both actions that increase current earnings without decreasing future earnings and actions that increase current earnings at the expense of future earnings" (p. 635). The authors called the former type of earnings management "business management" and the latter "reporting management." To proxy for business management (reporting management) the authors used changes in operating cash flows (discretionary accruals).

²¹Overall, Cheng and Warfield's (2005) results "suggest that CEOs with high equity incentives take more income increasing abnormal accruals than those with low equity incentives" (p. 467).

Institutional investors (e.g., insurance companies, superannuation and pension funds, investment trusts, financial institutions, etc.) play an active role in monitoring and disciplining managerial discretion (Hsu and Koh 2005) and generally encourage high-quality reported earnings (Velury and Jenkins 2006). Rajgopal and Venkatachalam (1998) found that institutional ownership is associated with less discretionary accruals manipulation. Specifically, their findings were “consistent with institutional investors monitoring managers and thus constraining them from engaging in accrual manipulation” (Rajgopal and Venkatachalam 1998, p. 3). Chung et al. (2002) examined whether the presence of large institutional shareholders is associated with the magnitude of discretionary accounting accruals and found that “institutional investors with large shareholdings inhibit²² managers from using DAC (discretionary accruals)” (p. 46).

Koh (2003) examined the association between (short) long-term institutional ownership²³ and firms’ income-increasing discretionary earnings management strategies (aggressive accruals management). The results suggested that long-term institutional investors constrain accruals management while transient institutional ownership is associated with aggressive earnings management. Hsu and Koh (2005) extended Koh’s (2003) study focusing on firms’ income-decreasing discretionary earnings management strategies and on incentives created by meeting/beating earnings thresholds (such as earnings decline and loss avoidance). The authors argued and found that when institutional investors “have sufficiently high ownership levels, they can act as an effective corporate governance mechanism in mitigating aggressive earnings management, even among firms that have strong incentives to do so” (p. 829). Similarly, Koh (2007) pursued the association between (short) long-term institutional ownership and earnings management strategies for firms that use accruals to meet/beat earnings targets. Consistent with prior studies, the results suggested that long-term institutional investors mitigate accruals management, while transient institutional ownership is associated with

²²Chung et al. (2002) specified: “When managers have incentives to increase reported profits, institutional investors put pressure on them to limit the use of income-increasing DAC (discretionary accruals). Similarly, when managers have incentives to decrease reported profits, institutions apply pressure on them to limit the use of income-decreasing discretionary accounting accruals” (p. 46).

²³Koh (2003) used the level of institutional ownership to proxy institutional ownership types, where a lower (higher) ownership region approximates short-term-oriented (long-term-oriented) institutional ownership. Furthermore, he examined the association between levels of institutional ownership and income-increasing discretionary accruals. He found a positive (negative) association between levels of institutional ownership and aggressive accruals management in a lower (higher) institutional ownership region. More generally, Velury and Jenkins (2006) found a positive association between institutional ownership and several attributes of earnings quality. By examining the impact of institutional ownership on overall earnings quality, the authors provided evidence on whether the quality of earnings improves as investment by institutions increases. However, this positive association between institutional ownership and earnings quality is negatively affected by increased ownership concentration (Velury and Jenkins 2006).

aggressive earnings management, although only among firms that manage earnings to meet/beat their earnings benchmarks.

Abarbanell and Lehavy (2003) investigated whether analysts' stock recommendations (e.g., buy, hold, or sell) have the power to incentivize managers to manage earnings. They found a tendency for firms rated a Sell (Buy) to engage more (less) frequently in extreme, income-decreasing earnings management, indicating that they have relatively stronger (weaker) incentives both to take earnings baths and to increase accounting reserves than other firms. In contrast, firms rated a Buy (Sell) are more (less) likely to engage in earnings management that leaves reported earnings equal to or slightly higher than analysts' forecasts (Abarbanell and Lehavy 2003, pp. 27–28).

Furthermore, several studies (e.g., Charitou et al. 2007; Lara et al. 2009; Leach and Newsom 2007; Rosner 2003; etc.) tried to prove the relationship between earnings management and severe financial troubles. Charitou et al. (2007) examined the earnings reporting decisions of the managers of 859 financially distressed firms that filed for bankruptcy. Their results showed that managers of distressed firms are generally engaged in negative earnings management behavior (decreasing earnings management) prior to filing for bankruptcy. Specifically, firms approaching default exhibit significant negative accruals. Similarly, Leach and Newsom (2007) used a sample of firms that had voluntarily or involuntarily filed for Chapter 11 under the United States Bankruptcy Code. The results of this latter study showed that in the two years prior to filing, companies (not convicted of fraud) adopt decreasing earnings management behavior. Finally, Lara et al. (2009) analyzed earnings quality for a sample of 264 failed firms (gone into administration or into receivership or were liquidated) in the four years prior to default. The findings showed that earnings management “starts four years prior to failure, and that accrual manipulation unravels in the year just before failure” (Lara et al. 2009, p. 121). By contrast, Rosner's (2003) findings suggested that non-stressed bankrupt firms (bankrupt firms that *ex ante* do not appear distressed) materially overstate earnings in pre-bankruptcy years.²⁴

Finally, a substantial body of literature explores managers' accounting choices in times of economic downturn. Indeed, financial crises offer a unique opportunity to study the effects of crisis on financial reporting quality (Kousenidis et al. 2013). Specifically, researchers have investigated the impact of financial crisis on earnings management (Kousenidis et al. 2013), the extent to which “economic crisis affects companies' scope for earnings management” (Iatridis and Dimitras 2013, p. 155), whether crisis leads “to a significant decline in the information value of discretionary earnings” (Choi et al. 2011, p. 184), and whether it has “encouraged” (Ahmad-Zaluki et al. 2011; Choi et al. 2011), or “influenced” (Rusmin et al. 2012) managers to

²⁴Rosner (2003) used a sample of 51 sanctioned and 242 non-sanctioned bankrupt firms. Within the non-sanctioned bankrupt firms, she created subsamples of stressed bankrupt firms (SB) and non-stressed bankrupt firms (NSB). Analyzing financial statements in a five-year window, she found evidence of earnings overstatement in the NSB which “resemble the SEC-sanctioned fraud firms” (Rosner 2003, p. 401).

engage in earnings management. Overall, the conclusions of these studies suggest that financial crisis may have both positive and negative effects on companies' earnings quality. The latter will be presented and discussed in Chaps. 4 and 5.

2.3.1.2 Specific Accruals Earnings Management: An Overview of Related Studies

Specific accruals research focuses on the discretionary portion of a single accrual account or on a number of individual accruals that might be used by managers in reaching their goals (e.g., accounts receivable, allowance for bad debts, depreciation estimates, valuation allowances against deferred tax assets, tax expenses, etc.).

McNichols and Wilson (1988) focused on the provision for bad debts. They examined a sample of firms whose receivables were an important subset of total assets and whose provision for bad debts was large relative to earnings,²⁵ while Teoh et al. (1998b) focused on companies' depreciation methods. They analyzed the accounting decisions made by initial public offering firms (IPOs) during the year they went public and found that IPOs engage in more income-increasing depreciation methods²⁶ "when they deviate from similarly performing non-issuing industry peers, and provide significantly less for uncollectible accounts receivable than their matched non-issuers" (p. 177).

Schrand and Wong (2003) investigated whether bank managers strategically manage earnings by setting high valuation allowances against deferred tax assets, thereby creating "hidden reserves" to use in subsequent periods to smooth earnings. Overall, their results indicated that most banks do not record a valuation allowance to manage earnings in times when the Statement of Financial Accounting Standards No. 109 (SFAS No. 109) is first being adopted, but rather to follow the guidelines of the accounting standard; although well-capitalized banks tend to over-reserve, i.e., show higher valuation allowances. However, after the initial adoption period of SFAS No. 109, banks adjust their valuation allowance to smooth earnings toward analyst forecasts and historical earnings per share.

Dhaliwal et al. (2004) argued²⁷ that reported taxes are used to manage earnings. Specifically, their results showed that firms tend to lower their projected effective

²⁵Specifically, within the sample of firms chosen, the mean ratio of receivables to total assets was 28.7%, compared to 22.3% for the Compustat population, while the mean ratio of allowance for uncollectible accounts receivable to net income before extraordinary item was 29.4%, compared to 20.3% for the Compustat population.

²⁶Teoh et al. (1998b) grouped the depreciation methods into three categories: accelerated, straight-line, and a combination of straight-line and accelerated. Straight-line is viewed as the most income-increasing method, followed by a combination of straight-line and accelerated, while the accelerated method suggests income-decreasing accounting policies. The income-increasing group therefore includes any IPO that uses a more income-increasing method than the matched firm does.

²⁷The authors argued: "Tax expense provides a final opportunity to meet earnings targets after the firm has agreed to any re-tax adjusting entries required by the independent auditors. Tax expense also contains the complexity and discretion necessary for information asymmetry to persist. Thus,

tax rates—from the third to the fourth fiscal quarter—when earnings fall short of analyst forecasts.

Marquardt and Wiedman (2004) investigated the behavior of some specific accruals (i.e., accounts receivable, special items, inventory, accounts payable, accrued liabilities, and depreciation expense) in three different and well-known earnings management contexts. Namely, around equity offerings, management buyouts, and in firms attempting to avoid reporting an earnings decrease. Under these conditions, managers' incentives to manage earnings are likely to be strong (Healy and Wahlen 1999). Indeed, the incentive behind managing earnings upwardly around equity offerings is perhaps to increase the offering proceeds and the stock price (Cohen and Zarowin 2010; DuCharme et al. 2004; Rangan 1998; Shivakumar 2000; Teoh et al. 1998b). However, managers who propose to go private presumably have the opposite goal of decreasing the share price and therefore manage earnings downwardly (DeAngelo 1986; Perry and Williams 1994). Finally, firms attempting to avoid reporting earnings decreases (or losses) represent a “pervasive phenomenon” (Burgstahler and Dichev 1997, p. 101). Managers, to avoid higher costs in transactions with stakeholders and in general because they are more averse to losses, manage earnings decreases and losses away (Burgstahler and Dichev 1997). Marquardt and Wiedman (2004) predicted and found that firms issuing equity appear to prefer managing earnings upward by accelerating revenue recognition. By contrast, in a management buyout context, firms manage earnings mainly through deferral of revenue recognition, while firms trying to avoid reporting earnings decreases or losses seem to prefer special items to manage earnings. However, the other specific accruals chosen by the authors (inventory, accounts payable, accrued liabilities, and depreciation expense) seem not to be the primary items managed in the three selected contexts.

2.3.2 *Studies Related to Real Activities Earnings Management*

Roychowdhury (2006) defined real activities earnings management “as departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations” (p. 337). Research on earnings management via managers' manipulation of real activities has focused on business decisions about research and development expenditures, price discounts, changes in credit policy, and about (intensifying or cutting) other discretionary expenditure; i.e., timing investments or financial decisions (Schipper 1989).

(Footnote 27 continued)

tax expense is a powerful setting in which to examine earnings management among a wide range of firms” (Dhaliwal et al. 2004, pp. 451–452).

Real activities are harder to detect than accruals manipulation since in the latter we have accounting standards as the benchmark; in the former, there are no rules and standards, i.e., ‘generally accepted real activities principles,’ to which we can refer. Furthermore, “it might be difficult to distinguish empirically between investment or production decisions (such as choosing the level of expenditures on research and development or on advertising, adding or dropping a product line, or acquiring another firm) that are undertaken purely to maximize share values and those undertaken purely to manage earnings” (Schipper 1989, p. 92).

Fudenberg and Tirole (1995) pointed to altering shipment schedules, offering end-of-period sales, and speeding up or deferring maintenance to smooth reported earnings (and to smooth the underlying cash flows). Healy and Wahlen (1999) argued that managers must exercise judgment in choosing the inventory levels, the timing of inventory shipments or purchases, receivable policies to make or defer expenditures (such as research and development, advertising, or maintenance), and in deciding how to structure corporate transactions (such as lease contracts or business combinations). Likewise, Dechow and Skinner (2000) specified real cash flow choices like delaying or accelerating sales, postponing or accelerating research and development or advertising expenditures. However, subsequent studies in the field provided evidence of real activities earnings management using different real activities proxies.

For example, Bartov (1993) suggested that managers sell fixed assets to smooth earnings and to mitigate accounting-based restrictions in debt covenants. Herrmann et al. (2003) found a negative relationship between income from asset sales and management forecast errors; i.e., firms increase (decrease) earnings through sales of fixed assets and marketable securities when their current operating income is below (above) management’s operating income forecast.

More recently, Roychowdhury (2006) investigated patterns in (a) cash flow from operations (CFO); (b) discretionary expenses, defined as the sum of advertising expenses, research and development (R&D) expenses, and selling, general and administrative (SG&A) expenses; and (c) production costs, calculated by adding to the cost of goods sold (COGS) the change in inventory. More specifically, his results provided evidence consistent with firms trying to avoid losses by offering price discounts, engaging in overproduction to report lower cost of goods sold, and reducing discretionary expenditures. Roychowdhury’s (2006) seems to be one of the most influential studies in the field. In his seminal paper, he defined the mainstream model and proxies to detect real activities earnings management. Subsequent research attempts to capture real activities earnings management have shown there is a general consensus about his real activities proxies and have followed his approach to detect real activities manipulations. Specifically, Roychowdhury’s (2006) mainstream metrics to proxy for real activities manipulations are abnormal²⁸ (a) levels of cash flow from operations, (b) production costs,

²⁸Deviations from the normal levels of these proxies are termed abnormal. Roychowdhury (2006) followed Dechow et al. (1998) to determine normal levels of cash flow from operations, production costs, and discretionary expenses.

and (c) and discretionary expenses. Roychowdhury's (2006) model to detect real activities earnings management is presented and discussed in Appendix.

For example, Cohen et al. (2008) relied on Roychowdhury's (2006) proxies to detect real earnings management activities in the pre-and post-Sarbanes-Oxley Act of 2002 (SOX) periods. Their results showed an increase in abnormal levels of cash flow from operations, discretionary expenses, and production costs after the passage of SOX, suggesting that firms intensified real earnings management techniques that are harder to detect.

Cohen and Zarowin (2010) considered Roychowdhury's (2006) metrics to study the level of real activities manipulations around seasoned equity offerings (SEOs). In particular, they focused on three real activities manipulation methods: acceleration of the timing of sales through increased price discounts or more lenient credit terms²⁹; reporting of lower COGS through increased production³⁰; and decreases in discretionary expenses including advertising, R&D, and SG&A expenses.³¹ Their results showed that SEO firms engage in real activities manipulation around a specific corporate finance event: SEOs. Similarly, Kothari et al.'s (2016) analysis revealed that the frequency of firms attempting to overstate earnings via real activities earnings management is significantly higher in offering years than in non-offering years (Kothari et al. 2016). This latter result suggests that at times of heightened scrutiny (which characterizes the time of securities issuance), managers can exhibit a preference for real activities manipulation strategies (i.e., cutting R&D and SG&A expenses) "if they wish to inflate earnings, because such strategies have a higher probability of escaping detection" (Kothari et al. 2016, p. 584).

Taylor and Xu (2010) investigated the consequences of real earnings management activities on firms' subsequent operating performances. To identify real earnings management firms with abnormal operating activities, they used Roychowdhury's (2006) estimation models. Taylor and Xu's (2010) results showed that real earnings management activities "do not have, on average, a significant negative consequence on firms' subsequent operating performances" (p. 132).

²⁹Cohen and Zarowin (2010) argued that "such discounts and lenient credit terms will temporarily increase sales volumes, but these are likely to disappear once the firm reverts to old prices. The additional sales will boost current period earnings, assuming the margins are positive. However, both price discounts and more lenient credit terms will result in lower cash flows in the current period" (p. 8).

³⁰Cohen and Zarowin (2010) argued that "managers can increase production more than necessary in order to increase earnings. When managers produce more units, they can spread the fixed overhead costs over a larger number of units, thus lowering fixed costs per unit. As long as the reduction in fixed costs per unit is not offset by any increase in marginal cost per unit, total cost per unit declines. This decreases reported cost of goods sold (COGS) and the firm can report higher operating margins. However, the firm will still incur other production and holding costs that will lead to higher annual production costs relative to sales, and lower cash flows from operations given sales levels" (p. 8).

³¹Cohen and Zarowin (2010) argued that "reducing such expenses will boost current period earnings. It could also lead to higher current period cash flows (at the risk of lower future cash flows) if the firm generally paid for such expenses in cash" (p. 8).

While Gunny (2005) concluded that real earnings management activities lead to declines in firms' subsequent operating performance, her findings in a more recent study suggest that firms engaging in real activities earnings management "to just meet earnings benchmarks have relatively better subsequent performance than firms that do not engage in RM [real activities earnings management] and miss or just meet the benchmarks" (Gunny 2010, p. 857).

Badertscher (2011) investigated how the degree and duration of firm overvaluation affect management's choice of alternative earnings management techniques. He distinguished three main types of earnings management practices (real transactions management, within-GAAP accruals management, and non-GAAP earnings management) in order to meet or beat "the unrealistic performance expectations incorporated in an overvalued stock price" (Badertscher 2011, p. 1492). Interestingly, the results show that overvalued firms initially engage in accruals management followed by real transactions management, turning to non-GAAP earnings management as a last resort. To detect real activities earnings management transactions, Badertscher (2011) employed Roychowdhury's (2006) proxies; i.e., the abnormal levels of cash flow from operations, abnormal decreases in discretionary expenses, and abnormally high inventory production to lower the costs of goods sold.

McGuire et al. (2012) investigated whether religiosity affects the methods managers use to manage earnings. More specifically, their results suggest that firms headquartered in areas with strong religious social norms follow conservative accounting practices and show less propensity to aggressive accrual accounting behavior. However, they find a positive association between religiosity and real activities earnings management suggesting that managers in religious areas prefer real earnings management to accruals manipulation.

McInnis and Collins (2011) examined whether analysts' cash flow forecasts increase the incidence of real activities management, thus affecting the methods managers use to manage earnings. In this study, the results showed that the use of real activities management increases after the provision of cash flow forecasts. In particular, they provide evidence of a significant decline in abnormal discretionary expenditures after cash flow forecasts. Both studies (McGuire et al. 2012; McInnis and Collins 2011) followed Roychowdhury (2006) to proxy for real earnings management activities by estimating abnormal cash flows, abnormal discretionary expenses, and abnormal production costs.

Zhao et al. (2012) examined whether antitakeover provisions increase or decrease the level of real earnings management activities to avoid earnings disappointments. Likewise, they employed Roychowdhury's (2006) metrics to detect real earnings management activities. They concluded that better protected firms, such as staggered-board firms, are associated with fewer abnormal real activities since a takeover protection mechanism "alleviates managers' concerns about hostile acquisitions and thus mitigates their pressure to avoid earnings disappointments through manipulating real activities" (Zhao et al. 2012, p. 134).

Zang's (2012) results showed that managers adjust the level of accrual manipulation according to the level of real activities manipulation realized. She

approached real activities manipulation by using two of the three metrics presented in Roychowdhury (2006), i.e., reducing COGS by overproduction and cutting discretionary expenditures such as R&D, advertising, and SG&A expenditures.

Alissa et al.'s (2013) study was among the first “to look at earnings management as a tool to influence credit ratings” (p. 130); or, to put it the other way around, it was the first to look at credit ratings as an incentive for firms to manage earnings. They examined whether firms that deviate from expected credit ratings engage in earnings management activities. Their results provide evidence that firms use income-increasing (-decreasing) strategies when they are below (above) their expected ratings. To proxy for real activities manipulations they considered Roychowdhury's (2006) metrics (i.e., abnormal levels of cash flow from operations, production costs, and discretionary expenses).

Wongsunwai (2013) followed Cohen and Zarowin's (2010) approach to capture real activities earnings management. However, Cohen and Zarowin (2010) constructed their measures of real earnings management based on the three metrics previously proposed by Roychowdhury (2006).

Cohen et al. (2009) explored the possibility that managers could reduce or boost advertising expenses to meet earnings benchmarks. Overall, their results indicated that firms reduce their advertising expenditures to avoid losses, declines in earnings, and to beat the earnings levels of the same quarter in the previous year.

Eldenburg et al. (2011) focused on a sample of nonprofit hospitals and identified other specific discretionary expenditures. They found that hospital CEOs manage earnings in non-operating activities such as curtailing spending to maintain or refurbish office space rented to physicians, and in non-revenue-generating areas such as general services, research and administration, and public relations.

Lastly, Cheng et al. (2016) examined how internal governance affects the extent of real earnings management. Specifically, they considered “whether key subordinate executives have the incentive and ability to constrain the extent of real earnings management” (Cheng et al. 2016, p. 1080). They derived measures of real earnings management following Roychowdhury (2006) and Cohen and Zarowin (2010). Their results provide evidence that “subordinate executives can provide an important monitoring role on the CEOs from the bottom up and that effective internal governance can reduce the extent of real earnings management” (Cheng et al. 2016, p. 1081).

2.3.3 Studies Related to Non-GAAP Earnings Management: Fraudulent Financial Reporting

Research that attempts to understand accounting fraud is an area that has been somewhat neglected in the literature. This is probably due to difficulties in obtaining data on fraud, or because the low base rate for fraud makes statistical inferences problematic (DeFond 2010). However, severe consequences await companies and

managers that commit financial reporting fraud relative to within-GAAP manipulators; the consequences often include bankruptcy, changes in ownership, and delisting by stock exchanges, in addition to the imposition of financial penalties. Furthermore, personal financial penalties being imposed on the executives and the possibility of serving a prison sentence is a realistic concrete scenario for fraudsters (Beasley et al. 1999). Moreover, the market reacts negatively to news of an investigation into a possible GAAP violation causing significant share price declines for firms under investigation (Feroz et al. 1991). Indeed, the announcement of suspicious accounting practices “on average leads to an 8% stock price decline” (Ak et al. 2013, p. 561). Therefore, exploring incentives for, and consequences of, financial reporting fraud is likely to be provocative and of great interest to both academics and practitioners.

Research on accounting fraud focuses on firms subject to Accounting and Auditing Enforcement Releases³² (AAERs) issued by the Securities and Exchange Commission (SEC). AAERs provide details on the nature of the misconduct, the actors involved, and how the misconduct affects financial statements. Using the SEC’s AAERs to select a sample of misstatement firms has several advantages (Dechow et al. 2011): (1) the use of AAERs as a proxy for earnings manipulation is a straightforward and consistent methodology that enables replication and avoids potential biases in subjective sampling strategies; and (2) AAERs are likely to capture a group of economically significant manipulations. However, control samples may include misstatements (i.e., misstating firms) not identified by the SEC, thereby reducing the predictive ability of accounting fraud detection models (Dechow et al. 2011). Indeed, the iceberg of undetected fraud is “3 times bigger under the water than above the water” (Dyck et al. 2013, p. 4).

Dechow et al. (1996) investigated some incentives for, and consequences of, earnings manipulation in a sample of 92 firms subject to Accounting and Auditing Enforcement Releases (AAERs) by the Securities and Exchange Commission (SEC), alleged to have violated accounting standards by overstating their earnings. Their results indicated that most “important motivations for earnings manipulation are the desire to attract external financing at low cost and to avoid debt covenant restrictions” (Dechow et al. 1996, p. 30). However, they found that manipulators enjoy initially lower costs of capital, but once the manipulation is revealed, the trend reverses and manipulators experience significant increases in their costs of capital. In addition, they found that manipulators have weak governance structures (e.g., SEC firms are less likely to have audit committees, have fewer outside directors, etc.) relative to the control sample (92 non-manipulator firms).

Similarly, Beasley (1996) examined the relationship between board of director composition and the occurrence of financial statement fraud. He started by

³²During, or upon completion of, an investigation involving accounting and auditing issues, the Division of Enforcement of the US Securities and Exchange Commission (SEC) may take enforcement action against firms, managers, auditors, and other parties involved in violation of federal securities laws by requiring the firm to change its accounting methods, restate its financial statements, and pay damages (Dechow et al. 2011).

examining the differences in board of director composition between 75 fraud and 75 no-fraud firms matched by size, industry, stock exchange, and time period. The results showed that no-fraud firms have significantly higher percentages of independent directors on the board of directors than fraud firms. No-fraud (fraud) firms have boards of directors that are, on average, composed of 64.7% (50.2%) outside directors. Additionally, he found that some characteristics of outside directors affect the likelihood of financial statement fraud. Specifically, as the level of ownership (i.e., stocks held by outside directors) increases, as the number of years of board service for outside directors increases, and as the number of directorship responsibilities in other firms held by outside directors decreases, the likelihood of financial statement fraud decreases as well (Beasley 1996).

Beneish (1997) analyzed 64 firms classified as GAAP violators; 49 out of 64 were firms subject to AAERs by the SEC, alleged to have violated GAAPs, while the remaining 15 firms publicly admitted to violating GAAPs. Originally, his control sample consisted of firms with large positive discretionary accruals labeled “aggressive accrualers” because his objective was to distinguish GAAP violators from aggressive—albeit legitimate—accrualers. Beneish investigated a set of variables and found that three of them, namely the day’s sales in receivables index, total accruals to total assets (the magnitude of accruals), and prior abnormal returns (prior performances), were statistically significant and could potentially explain the differences between the two groups. Overall, GAAP violators presented lower accruals in the year of violation and seemed to be “younger, more levered [sic] growth firms which experienced poorer stock market performance, a decline in receivables and inventory turnovers, and a deterioration of gross margins and asset quality” (Beneish 1997, p. 288) than aggressive accrualers.

Beneish (1999a) finally developed the M-score, an earnings manipulation detection model³³ entirely based on financial statement variables. It is an earnings management detection tool that is suitable for detecting the driving forces behind earnings overstatement, rather than understatement (Beneish 1999a), which estimates the likelihood of a firm being a manipulator. The model features eight financial statement-based variables constructed to capture either distortions due to earnings manipulations, i.e., the Days Sales in Receivables Index (DSRI), the Asset Quality Index (AQI), the Depreciation Index (DEPI), and Total Accruals to Total Assets (TATA), or the tendency to engage in earnings manipulation due to deteriorating economic conditions, i.e., the Gross Margin Index (GMI), the Sales Growth Index (SGI), the Sales General and Administrative Expenses Index (SGAI) and the Leverage Index (LVGI). Beneish et al. (2013) observed that “not all eight [variables] are individually important, but collectively they create a ‘composite sketch’, or profile, of a potential earnings manipulator” (p. 76).

³³ Beneish’s (1999a) model will be presented in Chap. 5 and not in Appendix since it is employed in the research design of the present study. Beneish (1997) presented a previous model for detecting earnings manipulation that differed from the M-score in three main ways: Beneish (1997) was estimated with 64 sample companies while Beneish (1999a) used 74 companies, the control sample was different, and the set of explanatory variables also differed.

Moreover, some of these accounting variables possess discriminatory power; specifically, the DSRI, the GMI, the AQI, the SGI, and the TATA. High values of these variables are associated with a greater probability of earnings manipulation. For instance, disproportionate increases in receivables raise the likelihood that a company has inflated its revenues, while deteriorating gross margins are a negative indicator of a company's prospects (Lev and Thiagarajan 1993) and "predispose companies to manipulate earnings" (Beneish et al. 2013, p. 76) since "companies with poorer prospects are more likely to engage in earnings manipulation" (Beneish 1999a, p. 26). High AQI values could be a signal of a company's increased involvement in cost deferral by shifting expenses onto its fixed assets. Similarly, growth does not imply manipulation per se, but growth companies that are facing growth deceleration have an incentive to manipulate earnings (Beneish 1999a). Thus, high SGI values are associated with a greater likelihood to commit financial statement fraud. Finally, high TATA values are consistent with manipulators having less cash behind their accounting income.

Beneish (1999b) investigated the incentives and the penalties for firms subject to AAERs by the SEC that were alleged to have violated accounting standards by overstating their earnings. While Dechow et al.'s (1996) results indicated that the cost of external financing and concerns about debt covenant violation provide important incentives for earnings manipulation, Beneish's (1999b) results were not consistent with these conclusions. He further found that managers of firms that violate GAAPs reduce their holdings during periods of earnings overstatement; i.e., they are more likely to sell their own stock during periods of inflated earnings than are managers of non-GAAP violators. The results suggest that a manager's desire to sell their equity at higher prices is a motivation for earnings manipulation (Beneish 1999b). Finally, Beneish provided some evidence about penalties (e.g., employment loss and monetary penalties) imposed on managers of firms with earnings overstatements that violate GAAPs.

However, if firms overstate their earnings then it is plausible that they will pay more tax than is necessary. Erickson et al. (2004) showed that firms pay substantial taxes on overstated earnings. For a sample of 27 firms subject to SEC enforcement actions, Erickson et al. (2004) estimated that these firms paid on an aggregate basis "\$320 million more to the tax authorities as a result of overstating earnings by approximately \$3.36 billion" (p. 389).

Carcello and Nagy (2004) examined the relationship between audit firm tenure and fraudulent financial reporting. Their results suggested that fraud is more likely to occur in the first three years of the auditor-client relationship.

Burns and Kedia (2006) examined the effects of CEO compensation contracts on misreporting. They showed that relative to other components of compensation (i.e., equity, restricted stock, long-term incentive payouts, and salary plus bonus), stock options are positively associated with stronger incentives to misreport. To mitigate executives' incentives to misreport, Burns and Kedia (2006) encourage a greater use of compensation alternatives in contracts other than stock options.

Erickson et al. (2006) analyzed executives' equity incentives resulting from the stock-based compensation of firms accused of accounting fraud by the SEC.

They concluded that “there is no consistent evidence of a link between executive equity incentives and accounting fraud” (Erickson et al. 2006, p. 119).

O’Connor et al. (2006) examined the effects of stock-based incentives on CEO earnings manipulation behaviors. Overall, their results suggest that the greater the value of the CEO’s stock options, the less likely it is that fraudulent financial reporting behavior will occur. However, in some specific contexts, i.e., the presence (absence) of CEO duality³⁴ and the absence (presence) of board stock options, increases in the value of CEO options increase the likelihood of fraudulent financial reporting. Specifically, “when either CEO duality or board stock options is present while the other is absent, increases in CEO stock options increase the likelihood of fraudulent financial reporting” (O’Connor et al. 2006, p. 493).

Using a sample of 95 firms that announced plans to restate one or more previously issued quarterly or annual financial statements, Efendi et al. (2007) found that CEOs with a sizable amount of in-the-money stock options (i.e., options with a current market value that exceeds the strike price) are more likely to issue misstated financial statements.

Zhang et al.’s (2008) findings suggested that firm performances interact with stock-based incentives to influence the likelihood of CEO earnings manipulation. Specifically, they found that under conditions of poor firm performance, CEOs with greater amounts of out-of-the-money options (i.e., worthless stock options that have a current market value lower than the strike price) and CEOs with lower amounts of stock ownership are the most inclined to manipulate earnings.

Kang (2008) examined whether an interlocking directorate acts as a channel whereby reputational penalties experienced by one firm (due to alleged financial reporting fraud) spill over to other firms. In a sample of firms accused of financial reporting fraud in the United States, he found some evidence of spillovers between firms through director interlocks. Kang (2008) argued that “the reputational penalties that firms incur as a result of alleged financial reporting fraud *on the average* induce investors to impute reputational penalties to their associated firms” (p. 550); as a result, associated firms experienced a significant drop in market value (Kang 2008).

Jones et al. (2008) evaluated the ability of the most popular earnings management detection model to also detect extreme cases of earnings management, i.e., financial reporting frauds. Specifically, Jones et al. (2008) tested the Jones (1991) model; the modified Jones model (Dechow et al. 1995); the modified Jones model with book-to-market ratio and cash flows (Larcker and Richardson 2004); the modified Jones model with return on assets (Kothari et al. 2005); two measures of accrual quality developed by Dechow and Dichev (2002) and McNichols (2002),³⁵ respectively, and the Beneish (1999a) M-score. They found that only the Dechow

³⁴O’Connor et al. (2006) explained: “CEO duality occurs when a single individual serves as both the CEO of a company and the chair of its board of directors” (p. 485).

³⁵McNichols (2002) modified and extended Dechow and Dichev’s (2002) measure.

and Dichev (2002), McNichols (2002), and Beneish (1999a) models have “explanatory power for fraud beyond total accruals” (Jones et al. 2008, p. 500).

However, an alternative earnings management detection tool is Benford’s law (Benford 1938). Broadly speaking, Benford’s Law reports how frequently a certain number appears in a naturally occurring empirical distribution. In artificially generated datasets, such as financial statements that had been manipulated through earnings management techniques, the numbers will, according to Benford’s Law, not appear with the same theoretical frequency expected by Benford’s distribution because “numbers in the financial statements are generated by economic agents who may have intent” (Amiram et al. 2014). For example Amiram et al. (2014) investigated financial statement irregularities applying Benford’s law. Appendix presents, among other earnings management detection tools, the Jones (1991) model, the modified Jones model (Dechow et al. 1995), and Benford’s (1938) law. Similarly, Ak et al. (2013) reviewed research that has developed financial ratio models to predict significant corporate events such as financial distress and bankruptcy, downsizing, raising equity capital, and material earnings misstatements. Relative to this latter aspect, Ak et al. (2013) suggested that “fraud firms want to appear to be growth firms in need of cash, so high accruals, sales growth, growth in receivables, growth in inventory, growth in leases, etc., are all indicative of potential misstatements” (p. 562).

Badertscher (2011) examined how the degree and duration of firm overvaluation affects management’s choice of alternative earnings management mechanisms. Consistent with Jensen (2005), he predicted that firm overvaluation pushes managers to engage in earnings management in an effort to sustain a firm’s overvalued share price.³⁶ He distinguished three main types of earnings management practices (real transactions management, within-GAAP and non-GAAP earnings management) and examined how one type of earnings management method segues into another in order to sustain overvaluation. Badertscher’s (2011) results showed that in the early stages of overvaluation, managers engage in within-GAAP earnings management before moving on to engage in real transactions management in order to sustain their overvalued equity. However, “as the duration of overvaluation

³⁶Jensen (2005) argued: “Like an addictive drug, manning the helm of an overvalued company feels great at first. If you are the CEO or CFO, you are on TV, and covered by the press, investors love you, your options are increasing in value, and the capital markets are wide open to your firm. But as drug users learn, massive pain lies ahead. [...]. So as time goes by it begins to dawn on managers of such overvalued firms that times are getting tough. You realize the markets will hammer you unless your company’s performance justifies the stock price. So after all value creating alternatives have been taken you start to take actions that destroy long run value that you hope will at least appear to generate the market’s expected performance in the short run. By doing this you postpone the day of reckoning until you are gone or you figure out how to resolve the issue. To appear to be satisfying growth expectations you use your overvalued equity to make long run value destroying acquisitions; you use your access to cheap debt and equity capital to engage in excessive internal spending and risky negative net present value investments that the market thinks will generate value; and eventually you turn to further accounting manipulation and even fraudulent practices to continue the appearance of growth and value creation” (pp. 9–10).

continues, overvalued firms are more likely to engage non-GAAP earnings management, the most egregious form of earnings management” (Badertscher 2011, p. 1514).

Dechow et al. (2011) provided an in-depth analysis of firms that have been subject to enforcement actions by the SEC for allegedly misstating their financial statements by overstating their earnings. They found that revenue misstatements, manipulation of expenses, and capitalizing costs were the most frequent types of misstatements made. Dechow et al. (2011) identified the characteristics of misstating firms by suggesting that these firms “have high accruals, show declining performance, are raising financing, and have high growth expectations embedded in their stock price” (p. 50) during misstatement years. Interestingly, they predicted and found that manipulations occur to mask deteriorating financial performance, to obtain financing, and to sustain growth expectations “made with the objective of covering up a slowdown in financial performance in order to maintain high stock market valuations” (Dechow et al. 2011, p. 77).

Dyck et al. (2013) attempted to size up the pervasiveness of fraud in US large publicly traded corporations and estimated that approximately 14.5% of large publicly traded corporations engage in fraud at any point in time.

Sun (2013) investigated the use of real activities earnings management techniques among firms subject to SEC Accounting and Auditing Enforcement Releases. Real activities earnings management literature provided evidence consistent with firms trying to sustain their performance, their overvalued stock price, and to avoid losses by reducing discretionary expenditures such as R &D and SG &A expenses (e.g., Badertscher 2011; Cohen and Zarowin 2010; Roychowdhury 2006; etc.). However, her results were partially contradictory and showed that “cutting R&D is not a viable option in a setting where managers desire to signal growth and maintain high stock market valuations” (Sun 2013, p. 1).

2.4 Main Incentives to Manage Earnings and Offset Causes

A common approach in earnings management literature is to first identify conditions in which managers’ incentives to manage earnings are likely to be strong, and then test whether patterns of earnings management are observable and consistent with these incentives (Healy and Wahlen 1999). Schipper and Vincent (2003) observed that one element of this research “posits incentives to manage earnings and then seeks evidence that earnings are managed in specific settings where the posited incentives are presumed” (p. 105). In other words, researchers focus on firm-specific contexts/events around which managers are expected to have strong incentives to manage reported earnings (Zhao et al. 2012). However, given the vast literature on earnings management, I do not provide a detailed literature review on incentives in this section since there are many papers available that discuss it in

great detail (e.g., Beneish 2001; Dechow et al. 2010; Dechow and Skinner 2000; DeFond 2010; Fields et al. 2001; Healy and Wahlen 1999; Lo 2008; McNichols 2000; Schipper 1989; Schipper and Vincent 2003; etc.).³⁷ I acknowledge that other incentives exist. Herein, the purpose is to present the most often discussed incentives in the previous literature and to highlight the main incentives (or causes) tested and the contradictory results provided by some of them for managing earnings since it is not clear whether these factors have the power to affect managers' earnings behavior. In addition, a few offsetting causes that may interfere with these main incentives are presented.

Bonus schemes create incentives for managers to select accounting procedures and accruals to maximize the value of their bonuses (Guidry et al. 1999; Healy 1985; Holthausen et al. 1995). Thus, when managers expect earnings to fall between the upper and lower limits of their bonus plan they choose to overstate earnings to maximize the value of their bonus awards. When the bonus plan's upper limit is largely met, deferring income does not reduce the current bonus and increases the manager's expected future award. On the other hand, it is not clear whether earnings (significantly) below the lower limit incentivize managers to further decrease earnings to maximize their expected future bonuses (Gaver et al. 1995; Holthausen et al. 1995). Moreover, in contrast to Healy's bonus-maximizing hypothesis, Burns and Kedia (2006) "do not find that salary and bonus significantly affect the adoption of aggressive accounting practices" (p. 53). However, their results suggest that stock options are positively associated with stronger incentives to misreport, while Erickson et al. (2006) find no consistent evidence of a link between stock-based incentives and accounting misstatements. Moreover, O'Connor et al.'s (2006) results suggested that the greater the value of the CEO's stock options, the less likely that fraudulent financial reporting behavior will occur, while Efendi et al. (2007) found that CEOs with a sizable amount of in-the-money stock options are more likely to issue misstated financial statements. In contrast to the latter study, Zhang et al. (2008) found that under conditions of poor firm performance, CEOs with larger amounts of out-of-the-money options are the most inclined to manipulate earnings.

Conventional wisdom suggests that debt agreements may motivate managers to manipulate earnings. Specifically, the earnings management literature suggests that managers make income-increasing accounting choices when their firms are close to

³⁷For example, according to Healy and Wahlen's (1999) framework, incentives for managing earnings can be classified into three macro areas of motivation: (1) capital market motivations; (2) contracting motivations; and (3) regulatory motivations. The first category of incentives "include studies of earnings management in periods surrounding capital market transactions and when there is a gap between firm performance and analysts' or investors' expectations" (p. 371). Contracting motivation studies "test whether the incentives created by lending and compensation contracts can explain earnings management" (p. 375). To sum up, these "studies suggest that compensation and lending contracts induce at least some firms to manage earnings to increase bonus awards, improve job security, and mitigate potential violation of debt covenants" (p. 377). Lastly, regulatory motivation studies explore whether regulation, regulatory scrutiny, or potential regulatory scrutiny creates an incentive for managing earnings.

debt covenant violation. For example, Bartov (1993) suggested that managers sell fixed assets to smooth earnings and to mitigate accounting-based restrictions in debt covenants. Similarly, DeFond and Jambalvo (1994) found evidence consistent with earnings manipulation by firms that violated debt covenants. On the other hand, DeAngelo et al. (1994) found that managers' accounting choices "primarily reflect recognition of their firms' financial difficulties, rather than systematic attempts to inflate income to avoid debt covenant violations or to otherwise portray the firm as less troubled" (p. 140). Furthermore, while Dechow et al.'s (1996) results indicated that concerns about debt covenant violations provide important incentives for earnings manipulation, Beniesh's (1999b) results were inconsistent with these conclusions. Beneish (1999b) did not find evidence of earnings manipulation motivated by concerns about debt covenant violation.

Contradictory results can also be observed around the time of certain types of corporate events, such as management buyouts (MBOs). Management's intention to go private may trigger opportunistic accounting choices (DeAngelo 1986; Marquardt and Wiedman 2004; Perry and Williams 1994). Indeed, managers who propose going private presumably have the goal of decreasing the stock price to minimize the amount of compensation that must be paid. While DeAngelo (1986) strongly rejected the hypothesis that managers who propose to take a public corporation private understate that corporation's earnings before the MBO, Perry and Williams (1994) showed that managers manipulate discretionary accruals downwards in the year preceding the public announcement of management's intention to go private. Consistent with this latter study, Marquardt and Wiedman (2004) found that firms manage earnings downward, mainly through deferral of revenue recognition, prior to MBOs.

Earnings management activity seems particularly plausible around SEOs, SBOs, and in firms issuing convertible bonds as well. Rangan (1998), Teoh et al. (1998a), Shivakumar (2000), DuCharme et al. (2004), and Cohen and Zarowin (2010) showed that SEO firms engage in earnings management around the time of new stock issuance. These studies found that SEO firms present positive abnormal accruals (i.e., upwardly managed earnings) in the year around the time of the SEO, perhaps to increase the offering proceeds. Similarly, Liu et al. (2010), Caton et al. (2011), and Chang et al. (2010) found that bonds issuers generally use positive discretionary accruals in the issuing year to promote their convertible bonds and to reduce the issuing costs. While these studies provided evidence of positive abnormal discretionary accruals in the issuing year, Kothari et al.'s (2016) analysis revealed that the likelihood of firms engaging solely in accruals management to inflate earnings is similar in both offering and non-offering years.

Earnings management around the time of an IPO is also plausible. An influential article written by Teoh et al. (1998b) showed that during the year of going public, IPO firms engage in more income-increasing (depreciation) methods. However, contrary to popular belief, Ball and Shivakumar (2008) found that IPOs do not inflate earnings and tend to report more conservatively "in order to meet the market demand for higher quality financials from public firms, and in response to public-firm regulation" (p. 346).

Some studies have shown that earnings are managed to meet the expectations of managers, financial analysts, and other stakeholders (e.g., Bartov et al. 2002; Bhojraj et al. 2009; Burgstahler and Eames 2006; Cheng and Warfield 2005; Chung et al. 2002; Cohen et al. 2009; Herrmann et al. 2003; Hsu and Koh 2005; Kasznik 1999; Kasznik and McNichols 2002; Kinney et al. 2002; Koh 2003, 2007; Matsumoto 2002; McInnis and Collins 2011; etc.). Public forecasts of firms' earnings may represent a strong incentive to manage earnings. Indeed, small negative earnings surprises are accompanied by large negative returns (Kinney et al. 2002), while firms that meet/beat their earnings expectations enjoy a higher return than their peers that fail to do so (Bartov et al. 2002). However, high analyst coverage, i.e., companies that are followed by more analysts, by experienced analysts, or by analysts from more prestigious brokerage houses (Yu 2008), and high (long-term) institutional ownership levels (Hsu and Koh 2005; Koh 2007) have the power to mitigate managers' propensity to meet or beat earnings benchmarks.

Nevertheless, it seems that other incentives (e.g., regulators, desire to attract external financing at a low cost, management and auditor changes, financial distress, etc.) may sometimes exercise pressure to manage earnings even though some offsetting causes exist.

Regulation and potential regulatory scrutiny can provide firms with incentives to manage earnings (Healy and Wahlen 1999). For example, Jones (1991) found that companies seeking import relief exercised income-decreasing discretionary accruals during the import-relief investigations, and Cahan's (1992) results showed that firms under investigation for monopoly-related violations reported income-decreasing abnormal accruals in investigation years. Hall (1993) and Byard et al. (2007) suggested that oil firms manage accruals to decrease earnings in periods when gasoline prices are rising to mask excessive high accounting rates of return, probably in the hopes of avoiding potential political cost increases. Furthermore, cable television (Key 1997) and real estate (Chen et al. 2011) companies respond with income-decreasing strategies to mitigate the effects of political scrutiny and potential regulation, suggesting that in times of scrutiny, making the industry seem less profitable appears to be the best choice.

Moreover, while pro-regulatory theorists argue that stronger regulation is needed to restore investor confidence, Ribstein (2002) showed that "more regulation is not the answer" (p. 3). Indeed, regulatory changes, or simply more regulation (e.g., the Sarbanes-Oxley Act of 2002) may trigger firms to switch from accrual-based earnings management to real "earnings-management techniques that, while likely to be more costly to shareholders, are harder to detect" (Cohen et al. 2008, p. 759).

However, other mechanisms affect management's choice of alternative earnings management technique as well, such as the degree and duration of firm overvaluation (Badertscher 2011) and religiosity (McGuire et al. 2012). Overvalued firms initially engage in accruals management followed by real transactions management, turning to non-GAAP earnings management as a last resort (Badertscher 2011), while managers in religious areas prefer more opaque real earnings management techniques to accruals manipulation (McGuire et al. 2011).

While the desire to attract external financing at a low cost is an important motivator for earnings manipulation (Dechow et al. 1996), Beneish (1999b) argued that the cost of external financing is a weaker incentive to manage earnings than the managers' desire to sell their equity at higher prices. Moreover, Alissa et al. (2013) posited that credit ratings have the power to affect managers' accounting behavior.

Finally, proxy contests for board seats may incentivize incumbent managers to manipulate earnings as well. DeAngelo (1988) provided evidence that incumbent managers typically increase earnings via positive discretionary accruals during an election campaign to paint a favorable picture of their own performance. Likewise, when auditors change, the more reasonable successors seem to accept less-conservative applications of accounting procedures (DeFond and Subramanyam 1998). Indeed, Carcello and Nagy (2004) found that fraud is more likely to occur in the first 3 years of the auditor-client relationship.

Nevertheless, few offsetting causes interfere with these main incentives. High analyst coverage (Yu 2008) and high (long-term) institutional ownership levels (Hsu and Koh 2005; Koh 2007) tend to mitigate opportunistic accounting behavior. Yu (2008) suggested "more analysts lead to less earnings management" (p. 268). Financial analysts fulfill a significant role in corporate governance because they reduce the information asymmetry between corporations and investors; they serve as external monitors to managers, facilitate the distribution of information, and affect the corporate production of information (Yu 2008). Institutional investors also play an active role in monitoring and disciplining managerial discretion (Rajgopal and Venkatachalam 1998), and generally encourage reported earnings to be of high quality (Velury and Jenkins 2006). Indeed, the findings of prior studies (e.g., Chung et al. 2002; Hsu and Koh 2005; Koh 2003, 2007; Rajgopal and Venkatachalam 1998) are consistent with institutional investors constraining managers' accounting discretion.

Further, the presence of independent directors on the board of director exercises a somewhat countervailing power to earnings management. Higher percentages of independent directors on boards are associated with less earnings manipulation (Beasley 1996). Moreover, outside directors demonstrating particular characteristics (i.e., a high level of stocks held, more years of board service, and fewer directorship responsibilities in other firms held), seem to inhibit managers' intent to misstate financial statements (Beasley 1996).

Finally, Zhao et al. (2012) suggested that antitakeover provisions, such as a staggered board of directors, may interfere with managers' accounting behavior. Indeed, they found that more protected firms are associated with less earnings management.³⁸

To sum up, (a) high analyst coverage; (b) high (long-term) institutional ownership levels; (c) the presence of independent directors on the board of directors; and (d) antitakeover provisions seem to have the power to mitigate managers'

³⁸Specifically, Zhao et al. (2012) found that antitakeover provisions decrease the level of real earnings management.

propensity to manage earnings. However, I am not sure whether that collection of countervailing powers has the ability to inhibit managers' intent to misstate financial statements. Similar to regulatory changes, more regulation (Cohen et al. 2008), and religion (McGuire et al. 2012), the four offsetting causes may incentivize managers to shift from accrual manipulation to real activities manipulation. In other words, these countervailing powers may trigger firms to switch from accrual-based earnings management to a real activities earnings management technique that is increasingly difficult to detect.

2.5 Conclusion

In this Book, earnings management is referred to as “a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain” (Schipper 1989, p. 92). Prior research identified two broad categories of earnings management: accrual-based and real earnings management activities. While accrual earnings management refers to the manipulation of earnings through the exploitation of an opportunity set of generally accepted procedures defined by accounting standards (Healy 1985), real earnings management is “accomplished by timing investment or financing decisions to alter reported earnings or some subset of it” (Schipper 1989, p. 92). Fraud is not to be considered a third main category of earnings management, nevertheless, “earnings management is the most common method of engaging in financial statement fraud” (Rezaee 2005, p. 282). Indeed, depending on the magnitude of the misstatement (Rosner 2003), both accruals earnings management and real activities earnings management can go beyond accepted limits and become fraudulent.

Contrary to the popular belief “that earnings management exists, [but] it has been remarkably difficult for researchers to convincingly document it” (Healy and Wahlen 1999, p. 370), a common approach has been to look for earnings management by adopting what Klayman and Ha (1987) referred to as a “positive test strategy,” i.e., to test “cases that are expected (or known) to have the property of interest rather than those expected (or known) to lack that property” (p. 211). Indeed, a widespread approach in the earnings management literature is to first identify conditions in which managers' incentives to manage earnings are likely to be strong, and then test whether patterns of earnings management are observable and consistent with these incentives (Healy and Wahlen 1999). Such earnings management research designs are mostly affected by the so-called ‘my side’ bias. To truly examine whether managers manipulate earnings upwardly (downwardly) to maximize the current (future) value of their bonus awards, upwardly to increase the offering proceeds during the year around an SEO, downwardly to reduce the share price in a management buyout, or to obtain import relief, etc., means testing

cases that are expected (or known) to have the property of interest: i.e., earnings management. Incentive-driven research designs seem like waiting for someone to do something wrong or right, even though having the opportunity to do wrong does not necessarily make for a thief.³⁹

However, accounting researchers need to understand the factors that cause earnings management in a world without incentive problems since otherwise “one would expect studies testing for earnings management to be likely to find null results except in contexts with incentives to manage earnings by sizable magnitudes” (McNichols 2000, p. 322). In order to understand the mechanism at work that may cause earnings management, researchers need to identify situations in which earnings management is unexpected or implausible.

Earnings management may take the form of either income-increasing or income-decreasing accounting choices. For example, to revise estimates of assets’ useful lives upwardly is an income-increasing choice, while the overstatement of an asset’s write-offs is an income-decreasing choice. Delaying sales, accelerating research and development, advertising, or maintenance expenditures are all income-decreasing strategies, while understatements of the provisions for bad debts, postponing research and development, advertising, or maintenance expenditures are all income-increasing strategies. Both income-increasing and income-decreasing accounting strategies are supported by relevant existing theories. Burgstahler and Dichev (1997) observed that transaction cost theory and prospect theory can plausibly be used to explain why earnings are upwardly managed. Transaction cost theory suggests that firms with higher earnings face lower costs in transactions with stakeholders (Burgstahler and Dichev 1997), whereas firms that report earnings decreases or losses face higher transaction costs, thereby creating an incentive to report higher earnings. Prospect theory postulates that decision-makers have different risk preferences (Eisenhardt 1989) and “derive value from gains and losses with respect to a reference point” (Burgstahler and Dichev 1997, p. 123). Nevertheless, while individuals might value losses and gains differently, they are generally more averse to losses than they are attracted to gains (Rusmin et al. 2012); hence, managers might overstate earnings.

Alternatively, agency theory can be used to explain why earnings are downwardly managed. Agency theory posits that accounting numbers play a central role in mitigating conflicts of interest between the managers and stockholders of listed firms (DeAngelo 1986). These conflicts are especially pronounced in specific

³⁹It is generally assumed that fraudsters are sensitive to the risk of sanctions. According to Dellaportas (2013), taking advantage of an opportunity, when the probability of detection and the severity of the penalties are high, becomes less frequent. However, herein the non-exploitation of an opportunity depends not on extrinsic conditions such as sanctions, consequences, or penalties, but on intrinsic properties or intrinsic enabling conditions of the ‘thief.’ Chapter 3 will clarify this position. At this point, it is sufficient to recognize that some would exploit the opportunity while others would not.

contexts (e.g., management buyout,⁴⁰ bonus schemes,⁴¹ etc.), thereby creating an incentive to understate earnings. Furthermore, the “big bath” argument is often invoked. Big bath accounting is a managerial stratagem (Walsh et al. 1991) based on the assumptions that “when circumstances are bad, making things just a little bit worse by cleaning out the rubbish does little harm to either reputation or prospects,” and that “little damage will ensue when the market is so depressed that nothing can hurt it more” (Walsh et al. 1991, p. 174). According to the big bath hypothesis, managers may undertake income-decreasing strategies in lean years, perhaps believing “that one very poor performance report is not as harmful as several mediocre performance reports (Arya et al. 1998, p. 8). Lastly, both strategies (income-increasing/decreasing) can be adopted to smooth earnings. Under the income-smoothing hypothesis, “earnings are manipulated to reduce fluctuations around some level that is considered normal for the firm” (Bartov 1993, p. 840). Nevertheless, whatever direction earnings management takes, whether income increasing or decreasing, a theory is always ready to support the relevant results.

Appendix: Earnings Management Detection Models

The Appendix presents the main earnings management detection tools developed by prior studies. Specifically the following models and techniques are presented:

- (a) models to measure the discretionary portion of total accruals (namely, the Healy 1985 model, the DeAngelo 1986 model, the Jones 1991 model, and the modified Jones models proposed by Dechow et al. 1995 and by Kothari et al. 2005);
- (b) a model to measure the discretionary portion of specific accruals (the Marquardt and Wiedman’s 2004 model);
- (c) a model to measure real activities earnings management (the Roychowdhury 2006 model); and
- (d) Benford’s (1938) Law, as applied in Amiram et al. (2014) to measure earnings management and financial irregularities.

- (a) Models to measure the discretionary portion of total accruals

Before examining discretionary accruals models, it is useful to recall some equation presented in Chap. 2. The “following basic accounting equation describes earnings

⁴⁰Perry and Williams (1994) showed that managers manipulate discretionary accruals downwards in the year preceding the public announcement of management’s intention to go private, presumably to reduce the share price.

⁴¹Healy (1985) suggested that when the bonus plan upper bound is largely met, deferring income that exceeds the upper bound does not reduce the current bonus and increases managers’ expected future award.

as being composed of an accrual component and a cash component” (Hribar and Collins 2002, p. 107):

$$E = CFO + TACC \quad (2.6)$$

where

E = reported earnings

$TACC$ = total accruals

CFO = cash flow from operations.

Therefore, the difference between earnings and cash flows corresponds to the total accrual portion of earnings. Accruals are therefore illustrated by the following equation:

$$TACC = E - CFO \quad (2.7)$$

where

E = reported earnings

$TACC$ = total accruals

CFO = cash flows from operations.

Further, accruals are decomposed by Healy (1985, 1996) into a non-discretionary (or expected) and a discretionary (or unexpected) component. Symbolically, total accruals in a given period consist of discretionary accruals, and non-discretionary accruals:

$$TACC = DACC + NDACC \quad (2.8)$$

where

$TACC$ = total accruals

$DACC$ = discretionary accruals

$NDACC$ = non-discretionary accruals

According to Bartov et al. (2001), the Healy 1985 model, the DeAngelo 1986 model, the Jones 1991 model, and the modified Jones model⁴² proposed by Dechow et al. 1995, involve computing total accruals ($TACC$). Therefore, the first step is to calculate $TACC$. Both, the balance sheet and the cash flow approach, presented in Chap. 2, can be used to compute $TACC$. Further, “to allow comparisons across firms, accrual measures in all models are typically scaled by total assets (TA) from the previous year (TA_{t-1})” (Thomas and Zhang 2000, 352). Consistent with the

⁴²The modified Jones model proposed by Kothari et al. (2005) involves computing $TACC$ as well.

balance sheet approach⁴³ or the cash flow⁴⁴ approach, TACC can be computed as follows:

$$TACC_{i,t} = \Delta CA_{i,t} - \Delta Cash_{i,t} - \Delta CL_{i,t} + \Delta DCL_{i,t} - DEP_{i,t} \quad (2.9)$$

$$TACC_{i,t} = EBXI_{i,t} - CFO_{i,t} \quad (2.10)$$

The aim of the following four discretionary accruals models presented herein is to separate the discretionary accruals (DACC) portion from total accruals (TACC). Therefore, the models differ in the way they compute DACC.

1. The Healy (1985) model

Healy (1985) uses the mean of total accruals ($TACC_t$) scaled by lagged total assets (TA_{t-1}) from the estimation period as the measure of non-discretionary accruals (Bartov et al. 2001). In other words, the author uses the mean of total accruals as a proxy for non-discretionary accruals. Healy's (1985) non-discretionary accruals ($NDACC_t$) in the event year t are the average total accruals during estimation period and are computed as follows (Bartov et al. 2001):

$$NDACC_t = 1/n \sum_{\tau} (TACC_{\tau}/TA_{\tau-1}) \quad (2.11)$$

where

$NDACC_t$ = estimated nondiscretionary accruals in year t scaled by lagged total assets;

n = is the number of years in the estimation period; and

τ = is a year subscript indicating a year in the event period ($t - n, t - n + 1, \dots, t - 1$).

Since, total accruals in a given period consist of discretionary accruals and non-discretionary accruals, the discretionary portion of TACC, i.e. DACC, is then the difference between $TACC_{i,t}$ for firm i in the event year t scaled by $TA_{i,t-1}$ and $NDACC_t$:

$$DACC_t = (TACC_{i,t}/TA_{i,t-1}) - NDACC_t \quad (2.12)$$

The Healy (1985) model presented herein is an adapted version by Dechow et al. (1995). As suggested by Thomas and Zhang (2000) the main difference between

⁴³Where: $TACC_{i,t}$ is total accruals for firm i in year t ; $\Delta CA_{i,t}$ is the change in current assets of firm i in year t ; $\Delta Cash_{i,t}$ is the change in cash and cash equivalents of firm i in year t ; $\Delta CL_{i,t}$ is the change in current liabilities of firm i in year t ; $\Delta DCL_{i,t}$ is the change in debt included in current liabilities (i.e., current maturities of long-term debt) of firm i in year t ; and $DEP_{i,t}$ is the depreciation and amortization expense of firm i in year t . Changes (Δ) are computed between time t and $t - 1$.

⁴⁴Where: $TACC_{i,t}$ is total accruals for firm i in year t ; $EBXI_{i,t}$ is earnings before extraordinary items of firm i in year t ; and $CFO_{i,t}$ operational cash flows of firm i in year t .

Healy's (1985) original model and the adapted version of Healy (1985) by Dechow et al. (1995) lies in the computation of the mean total accruals which Healy assumes to equal the non-discretionary accruals. Healy (1985) assumes "that non-discretionary accruals for each firm equal the mean accrual of all other firm-years in his sample (since his tests are based on comparisons of mean accruals across portfolios of firm-years with different predictions for discretionary accruals)" (Thomas and Zhang 2000, p. 353). The adapted version is based on a time-series firm-specific mean, i.e. NDACC are firm specific and based on the mean of the past years' accruals as an expectation for this year's accruals, rather than a cross sectional mean (Thomas and Zhang 2000).

2. The DeAngelo (1986) model

DeAngelo (1986) takes the total accruals in the immediately prior period as a benchmark for what the current accruals would be, absent earnings manipulation. Therefore, non-manipulated normal accruals⁴⁵ ($NORMTACC_{i,t}$) of firm i in year t , are equal to total accruals ($TACC_{i,t-1}$) of firm i in year $t-1$:

$$NORMTACC_{i,t} = TACC_{i,t-1} \quad (2.13)$$

Hence, manipulated abnormal accruals ($ABNORMTACC_{i,t}$)⁴⁶ of firm i in year t , are equal to the difference between total accruals ($TACC_{i,t}$) of firm i in year t and non-manipulated normal accruals ($NORMTACC_{i,t}$ or total accruals $TACC_{i,t-1}$):

$$ABNORMTACC_{i,t} = TACC_{i,t} - TACC_{i,t-1} \quad (2.14)$$

The DeAngelo (1986) year-to-year approach has been adapted in prior research and adjusted with scaled accruals (Thomas and Zhang 2000). Among others, Dechow et al. (1995) and Bartov et al. (2001), describe the DeAngelo's (1986) model as follows:

$$NDACC_{i,t} = TACC_{i,t-1} / TA_{i,t-2} \quad (2.15)$$

where

$NDACC_{i,t}$ = non-discretionary accruals of firm i in year t (corresponds to $NORMTACC_{i,t}$ in Eq. (2.13); and
 $TACC_{i,t-1}$ = total accruals of firm i in year $t-1$ scaled by lagged total assets ($TA_{i,t-2}$);

⁴⁵According to (Peasnell et al. 2000), I use the terms "non-manipulated normal accruals", "unmanaged accruals", "non-discretionary accruals", "expected", and "normal accruals" interchangeably.

⁴⁶Following conventional practice (Peasnell et al. 2000), I use the terms "manipulated abnormal accruals", "managed accruals", "discretionary accruals", "unexpected", and "abnormal accruals" interchangeably.

The discretionary accruals ($DACC_{i,t}$) of firm i in year t is then the difference between total accruals ($TACC_{i,t}$) of firm i in year t scaled by total assets ($TA_{i,t-1}$) and non-discretionary accruals ($NDACC_{i,t}$) of firm i in year t .

3. The Jones (1991) model

Jones (1991) uses an expectations model to estimate normal total accruals as a function of the change in revenue and the level of property plant and equipment. To predict normal total accruals in the estimation period Jones (1991) uses the following theoretical linear regression model:

$$TACC_{i,t}/TA_{i,t-1} = \alpha_i(1/TA_{i,t-1}) + \beta_{1i}(\Delta REV_{i,t}/TA_{i,t-1}) + \beta_{2i}(PPE_{i,t}/TA_{i,t-1}) + \varepsilon_{i,t} \quad (2.16)$$

where

$TACC_{i,t}/TA_{i,t-1}$ = total accruals for firm i in the event year t scaled by total assets ($TA_{i,t-1}$) from the previous period;

$\Delta REV_{i,t}/TA_{i,t-1}$ = change in revenues (revenue year t less revenue $t-1$) for firm i scaled by total assets ($TA_{i,t-1}$) from the previous period;

$PPE_{i,t}/TA_{i,t-1}$ = gross property, plant, and equipment in year t for firm i scaled by total assets ($TA_{i,t-1}$) from the previous period

$\varepsilon_{i,t}$ = error term in year t for firm i ; and

α_i , β_{1i} , and β_{2i} = regression parameters to be estimated.⁴⁷

Jones (1991) adopted a time-series approach⁴⁸ Further, cross-sectional analysis avoids the assumption in the time-series models that the coefficients are stable across years for the specific firm (DeFond and Jambalvo 1994). To get

⁴⁷The first term $\alpha(1/TA_{i,t-1})$ is a scaled intercept through prior-year total assets. Like the other variables, the intercept, is scaled by prior-year total assets to avoid heteroscedasticity. While prior research typically does not include a constant in the above model (e.g. Abarbanell and Lehavy 2003; Cohen et al. 2010; Dechow et al. 1995; Subramanyam 1996; etc.) some studies (e.g., Kothari et al. 2005; Zang 2012; etc.) include both, an intercept (α) as well as a scaled intercept $\alpha/TA_{i,t-1}$ in the Jones (1991) and in the modifies Jones model (Dechow et al. 1995). Other studies (e.g., Gaver et al. 1995; Peasnell et al. 2000; Rangan 1998; etc.) do not scale the intercept.

⁴⁸The Jones (1991) model of normal accruals has been estimated cross-sectionally by DeFond and Jambalvo (1994) first. Cross-sectional versions of the Jones (1991) model are estimated using data from firms matched on year and industry. The cross-sectional Jones model is similar to the original Jones (1991) model but estimated by using cross-sectional, not time-series, data. Therefore, the estimated parameters are industry and year specific rather than firm specific, and are obtained using data from all firms matched on year and two-digit Standard Industrial Classification (SIC) code (Bartov et al. 2001). Matching at a finer level of SIC code (e.g. the four-digit level) may cause a significant loss of firms (DeFond and Jambalvo 1994). However, Kothari (2001) explains the pros of the cross-sectional approach: “cross-sectional estimation imposes milder data availability requirements for a firm to be included for analysis than time-series estimation. This mitigates potential survivor bias problems. The precision of the estimates is also likely higher in cross-sectional estimation because of larger sample sizes than the number of time-series observations for an individual firm” (p. 163).

firm-specific estimated parameters⁴⁹ (a_i , $b_{1,i}$, and $b_{2,i}$) separately for each firm. Consistently, Jones (1991) excluded firms with less than 14 years observation and “regressed on the change in sales (AREV) and the gross level of property, plant, and equipment (PPE) for each sample firm, using the longest available time-series of data immediately prior to the ‘event’ year” (Peasnell et al. 2000, p. 314). However, Dechow et al. (1995) and Thomas and Zhang (2000) consider a ten-year estimation period sufficient, while Guay et al. (1996) have chosen a 15-year threshold. After running the regression, once the estimated firm-specific parameters a_i , $b_{1,i}$, and $b_{2,i}$ have been obtained from Eq. (2.16), the next step is to compute normal accruals ($NORMACC_{i,t}$).⁵⁰ The Jones model for $NORMACC_{i,t}$ in the event year (computed together with the estimated regression coefficients, i.e., a_i , $b_{1,i}$, and $b_{2,i}$, and company’s specific data for the event year) is:

$$NORMACC_{i,t} = a_i(1/TA_{i,t-1}) + b_{1i}(\Delta REV_{i,t}/TA_{i,t-1}) + b_{2i}(PPE_{i,t}/TA_{i,t-1}) \quad (2.17)$$

The discretionary accruals ($DACC_{i,t}$) for firm i in year t are then computed by subtracting normal accruals ($NORMACC_{i,t}$) for firm i in year t from the total accruals ($TACC_{i,t}$) for firm i in the event year t (computed as in Eqs. 2.9 or 2.10 and scaled by total assets, i.e. $TA_{i,t-1}$, from the previous period).

An example will clarify. The following example is based on the simpler, with unscaled intercept, time-series Jones (1991) model, as suggested by Peasnell et al. (2000), Rangan (1998), and Gaver et al. (1995). To predict normal accruals in the estimation period I use Eq. 2.16 with an unscaled intercept; i.e., the first term α ($1/TA_{i,t-1}$) is replaced by a constant α . The simplified theoretical linear regression model is as follows:

$$TACC_{i,t}/TA_{i,t-1} = \alpha_i + \beta_{1i}(\Delta REV_{i,t}/TA_{i,t-1}) + \beta_{2i}(PPE_{i,t}/TA_{i,t-1}) + \varepsilon_{i,t} \quad (2.18)$$

Other specification are as follows:

- total accruals ($TACC_{i,t}$) are computed using the cash flow statement approach; i.e., $TACC_{i,t} = EBXI_{i,t} - CFO_{i,t}$, where $EBXI_{i,t}$ is earnings before extraordinary items of firm i in year t ; and $CFO_{i,t}$ is operational cash flow of firm i in year t ;
- parameters are estimated with a time series approach. Similarly to Dechow et al. (1995) and Thomas and Zhang (2000) I consider a ten-year estimation period to be sufficient;
- consistent with Jones (1991), during the estimation period no systematic earnings management is hypothesized. Specifically the estimation years are 2001–2010 while earnings management is supposed for 2011, 2012 and 2013.

⁴⁹Jones (1991) specifies: “ordinary last squares is used to obtain estimates a_i , $b_{1,i}$, and $b_{2,i}$, of α_i , $\beta_{1,i}$, and $\beta_{2,i}$ respectively” (p. 212).

⁵⁰Accordingly, I use the terms “non-discretionary accruals” and “normal accruals” interchangeably (Peasnell et al. 2000).

Table 2.1 Raw data needed to test the Jones (1991) model

Year*	$PPE_{i,t}$	$TA_{i,t}$	$TA_{i,t-1}$	$Rev_{i,t}$	$Rev_{i,t-1}$	ΔRev	$EBX_{i,t}$	$CFO_{i,t}$
2001	1,412,522	14,105,568	12,105,568	7,185,624	7,085,624	100,000	595,345	1,843,562
2002	2,225,220	15,305,568	14,105,568	10,185,624	7,185,624	3,000,000	619,555	1,745,670
2003	2,812,522	16,505,568	15,305,568	12,185,624	10,185,624	2,000,000	622,700	1,940,444
2004	3,412,522	16,705,568	16,505,568	13,185,624	12,185,624	1,000,000	819,266	1,840,367
2005	6,841,093	17,673,514	16,705,568	16,872,081	13,185,624	3,686,457	1,050,935	2,644,006
2006	6,295,327	18,044,326	17,673,514	19,007,335	16,872,081	2,135,254	1,183,188	2,741,158
2007	5,826,879	19,264,094	18,044,326	20,882,578	19,007,335	1,875,243	1,233,748	2,959,477
2008	10,288,874	27,471,077	19,264,094	21,725,739	20,882,578	843,161	1,423,319	3,188,321
2009	10,914,153	29,735,603	27,471,077	14,644,739	21,725,739	-7,081,000	132,320	1,310,942
2010	11,125,566	28,531,866	29,735,603	23,708,613	14,644,739	9,063,874	124,843	1,199,564
2011	9,649,430	28,437,641	28,531,866	27,688,721	23,708,613	3,980,108	169,267	2,111,205
2012	10,550,709	25,738,624	28,437,641	20,250,576	27,688,721	-7,438,145	6,174,948	3,921,005
2013	6,985,222	18,113,710	25,738,624	14,400,779	20,250,576	-5,849,797	4,027,313	3,166,532

*Years refers to the closing fiscal year; $PPE_{i,t}$ is gross property, plant, and equipment for firm i in year t ; $Rev_{i,t}$ is revenue for firm i in year t ; $Rev_{i,t-1}$ is prior year revenue, and ΔRev is the change in revenue. The remaining items are as previously defined

Table 2.2 Total accruals and regression variables

Year	$TACC_{i,t}$	$TACC_{i,t}/TA_{i,t-1}$	$\Delta Rev/TA_{i,t-1}$	$PPE_{i,t}/TA_{i,t-1}$
2001	-1.248.217	-0.176	0.008	0.117
2002	-1.126.115	-0.157	0.213	0.158
2003	-1.317.744	-0.129	0.131	0.184
2004	-1.021.101	-0.084	0.061	0.207
2005	-1.593.071	-0.121	0.221	0.410
2006	-1.557.970	-0.092	0.121	0.356
2007	-1.725.729	-0.091	0.104	0.323
2008	-1.765.002	-0.085	0.044	0.534
2009	-1.178.622	-0.054	-0.258	0.397
2010	-1.074.721	-0.073	0.305	0.374
2011	-1.941.938	-0.082	0.139	0.338
2012	2.253.943	0.081	-0.262	0.371
2013	860.781	0.043	-0.227	0.271

Table 2.3 Regression results

Theoretical model parameters	Coefficients
α	-0.161
β_1	-0.057
β_2	0.197

Table 2.1 shows all the raw data needed to apply the model.

Table 2.2 shows total accruals ($TACC_{i,t}$) and the regression variables ($TACC_{i,t}$, ΔRev and $PPE_{i,t}$) scaled by prior year total assets ($TA_{i,t-1}$). The variables needed to estimate the regression parameters, during the estimation period (2001–2010), are marked light grey. Table 2.3 reports the results of the regression, i.e. the estimated parameters for period 2001–2010. The estimated parameters will be used to compute normal accruals ($NORMACC_{i,t}$) for period (2001–2013).

Table 2.4 reports the normal accruals ($NORMACC_{i,t}$) and the discretionary accruals ($DACC_{i,t}$). $NORMACC_{i,t}$ are computed as follows:

$$NORMACC_{i,t} = a_i + b_{1i}(\Delta REV_{i,t}/TA_{i,t-1}) + b_{2i}(PPE_{i,t}/TA_{i,t-1}) \quad (2.19)$$

The discretionary accruals ($DACC_{i,t}$) for firm i in year t are then computed by subtracting normal accruals ($NORMACC_{i,t}$) for firm i in year t from the total accruals ($TACC_{i,t}$) for firm i in the event year scaled by total assets ($TA_{i,t-1}$), i.e. $TACC_{i,t}/TA_{i,t-1}$, represented in the previous Table 2.2.

Finally, to assess the magnitude of earnings management one has to compare the values of $DACC$ in year 2011, 2012, and 2013 with the mean (0.00),⁵¹ the

⁵¹More specifically, the value of the mean is a very small number (0,000000000000000000305311).

Table 2.4 Regression parameters, variables, normal accruals (NORMACC) and discretionary accruals (DACC)

Year	$\alpha = a_i$	$\beta_1 = b_1$	$\beta_2 = b_2$	$b_1 (\Delta \text{Rev}/\text{TA}_{i,t-1})$	$b_2 (\text{PPE}_{i,t}/\text{TA}_{i,t-1})$	$\text{NORMACC}_{i,t}$	$\text{DACC}_{i,t}$
2001	-0.161	-0.057	0.197	-0.001	0.023	-0.139	-0.038
2002	-0.161	-0.057	0.197	-0.012	0.031	-0.142	-0.015
2003	-0.161	-0.057	0.197	-0.007	0.036	-0.132	0.003
2004	-0.161	-0.057	0.197	-0.003	0.041	-0.124	0.040
2005	-0.161	-0.057	0.197	-0.013	0.081	-0.093	-0.028
2006	-0.161	-0.057	0.197	-0.007	0.070	-0.098	0.005
2007	-0.161	-0.057	0.197	-0.006	0.064	-0.103	0.013
2008	-0.161	-0.057	0.197	-0.003	0.105	-0.058	-0.026
2009	-0.161	-0.057	0.197	0.015	0.078	-0.068	0.014
2010	-0.161	-0.057	0.197	-0.017	0.074	-0.105	0.031
2011	-0.161	-0.057	0.197	-0.008	0.067	-0.102	0.020
2012	-0.161	-0.057	0.197	0.015	0.073	-0.073	0.155
2013	-0.161	-0.057	0.197	0.013	0.054	-0.095	0.137

minimum (-0.038), and maximum (0.040) values of DACC during the estimation period (2001–2010) marked light grey. In this example, I can conclude that the 0.020 DACC value in 2011 is greater than the minimum but is less than the maximum value of DACC therefore no evidence of upwardly/downwardly managed earnings is shown. By contrast, the values in 2012 (0.155) and 2013 (0.137) are greater than the maximum value of DACC. Therefore, in 2012 and 2013 there might be a suspect in terms of manipulating earnings upwards.

4. The modified Jones (1991) model proposed by Dechow et al. (1995)

The only adjustment relative to the original Jones (1991) model is that the change in revenues ($\Delta \text{REV}_{i,t}$) is adjusted by subtracting the change in accounts receivable ($\Delta \text{REC}_{i,t}$) from it (Dechow et al. 1995), both scaled by total assets ($\text{TA}_{i,t-1}$). However, the adjustment is applied by Dechow et al. (1995) in the second stage of the regression, i.e. in computing $\text{NORMACC}_{i,t}$ (or $\text{NDACC}_{i,t}$) in the event year. Therefore, the estimated firm-specific parameters (a_i , $b_{1,i}$, and $b_{2,i}$) are obtained from the original Jones (1991) as in Eq. 2.16 and $\text{NORMACC}_{i,t}$ during the estimation period⁵² (in which no systematic earnings management is hypothesized) are obtained from Eq. 2.17 as usual. While, in the second stage of the regression, to compute normal accruals ($\text{NORMACC}_{i,t}$ or $\text{NDACC}_{i,t}$) in the event period (i.e., the year in which earnings management is hypothesized), the computed estimated parameters are applied to the following adjusted 2.20 equation for $\text{NORMACC}_{i,t}$:

⁵²Following Jones (1991), Dechow et al. (1995) adopted a time-series approach. However, the modified Jones model can be estimated cross-sectionally as well.

$$NORMACC_{it} = a_i(1/TA_{i,t-1}) + b_{1i}[(\Delta REV_{i,t}/TA_{i,t-1}) - (\Delta REC_{i,t}/TA_{i,t-1})] + b_{2i}(PPE_{i,t}/TA_{i,t-1}) \quad (2.20)$$

To sum up, the estimates of (a_i , $b_{1,i}$, and $b_{2,i}$) and $NORMACC_{i,t}$ during the estimation period (in which no systematic earnings management is hypothesized) are obtained from the original Jones (1991) model. The only adjustment relative to the original model is that the change in revenues ($\Delta REV_{i,t}/TA_{i,t-1}$) is adjusted for the change in receivables ($\Delta REC_{i,t}/TA_{i,t-1}$) in the event period, thus assuming that all changes in receivables in the event period result from earnings management (Dechow et al. 1995). Hence, Dechow et al. (1995) use the parameters from the Jones (1991) model estimated in the pre-event period (estimation period) for each firm in their sample, and apply those to a modified revenue change variable ($\Delta REV_{i,t} - \Delta REC_{i,t}$) to estimate discretionary accruals in the event period.

However, some subsequent studies (e.g., Guidry et al. 1999; Jones et al. 2008; Kothari et al. 2005; etc.) slightly modified this approach. For example, Kothari et al. (2005) argue that the Dechow et al. (1995) approach “is likely to generate a large estimated discretionary accrual whenever a firm experiences extreme growth in the test period compared to the estimation period” (p. 174). Therefore, to mitigate this problem and because sometimes there is no ‘pre-event’ period (estimation period) where one can assume that changes in accounts receivable are unmanaged, Kothari et al. (2005) estimate the model as if all changes in accounts receivable arise from earnings management. That is, they estimate the Jones model using the change in revenues ($\Delta REV_{i,t}/TA_{i,t-1}$) net of the change in receivables ($\Delta REC_{i,t}/TA_{i,t-1}$) as in the following adjusted Eq. 2.21⁵³:

$$TACC_{i,t}/TA_{i,t-1} = \alpha_0 + \alpha_{1i}(1/TA_{i,t-1}) + \beta_{1i}[(\Delta REV_{i,t}/TA_{i,t-1}) - (\Delta REC_{i,t}/TA_{i,t-1})] + \beta_{2i}(PPE_{i,t}/TA_{i,t-1}) + \varepsilon_{i,t} \quad (2.21)$$

(b) A Model to measure the discretionary portion of specific accruals

Marquardt and Wiedman’s (2004) suggest investigating a set of six specific accruals accounts. Namely, accounts receivable, inventory, accounts payable, accrued liabilities, depreciation expense, and special items. To capture the unexpected (i.e., the discretionary) portion of the specific accruals they developed the following six measures:

(1) Unexpected Accounts Receivable (UAR):

The first step, in computing UAR is to compute expected (normal or non-discretionary) levels of accounts receivable. Once computed expected accounts

⁵³Kothari et al. (2005) also add a constant (α_0) to the original Jones (1991) model. A constant provides an additional control for heteroscedasticity (not alleviated by using assets as the deflator), and mitigates problems stemming from an omitted size variable (Kothari et al. 2005).

receivable (EAR), the discretionary portion of accounts receivable (i.e., UAR) is obtained by subtracting from the actual accounts receivable (AR) the expected accounts receivable (EAR) value. The expected accounts receivable (EAR) value is computed as follows:

$$EAR_{i,t} = (AR_{i,t-1} * SALES_{i,t} / SALES_{i,t-1}) / TA_{i,t-1} \quad (2.22)$$

where

$EAR_{i,t}$ = expected accounts receivable for firm i in year t ;

$AR_{i,t-1}$ = prior year accounts receivable for firm i ;

$SALES_{i,t} / SALES_{i,t-1}$ = growth in sales for firm i ; and

$TA_{i,t-1}$ = prior year total assets for firm i (i.e. scaled total assets).

Therefore, the discretionary portion of accounts receivable (i.e., UAR) is the difference between the actual accounts receivable scaled by total assets ($AR_{i,t} / TA_{i,t-1}$) and $EAR_{i,t}$:

$$UAR_{i,t} = (AR_{i,t} / TA_{i,t-1}) - EAR_{i,t} \quad (2.23)$$

(2) Unexpected Inventory (UINV)

The first step, in computing UINV is to compute expected (normal or non-discretionary) levels of inventory. Once computed expected inventory (EINV), the discretionary portion of inventory (i.e., UINV) is obtained by subtracting from the actual inventory (INV) the expected inventory (EINV) value. The expected inventory (EINV) value is computed as follows:

$$EINV_{i,t} = (INV_{i,t-1} * COGS_{i,t} / COGS_{i,t-1}) / TA_{i,t-1} \quad (2.24)$$

where

$EINV_{i,t}$ = expected inventory for firm i in year t ;

$INV_{i,t-1}$ = prior year inventory for firm i ;

$COGS_{i,t} / COGS_{i,t-1}$ = growth in cost of goods sold for firm i ; and

$TA_{i,t-1}$ = prior year total assets for firm i (i.e. scaled total assets).

Therefore, the discretionary portion of inventory (i.e., UINV) is the difference between the actual inventory scaled by total assets ($INV_{i,t} / TA_{i,t-1}$) and $EINV_{i,t}$:

$$UINV_{i,t} = (INV_{i,t} / TA_{i,t-1}) - EINV_{i,t} \quad (2.25)$$

(3) Unexpected Accounts Payable (UAP)

The first step, in computing UAP is to compute expected (normal or non-discretionary) levels of accounts payable. Once computed expected accounts payable (EAP), the discretionary portion of accounts payable (i.e., UAP) is obtained by

subtracting from the actual accounts payable (AP) the expected accounts payable (EAP) value. The expected accounts payable (EAP) value is computed as follows:

$$EAP_{i,t} = (AP_{i,t-1} * COGS_{i,t} / COGS_{i,t-1}) / TA_{i,t-1} \quad (2.26)$$

where

$EAP_{i,t}$ = expected accounts payable for firm i in year t ;

$AP_{i,t-1}$ = prior year accounts payable for firm i ;

$COGS_{i,t} / COGS_{i,t-1}$ = growth in cost of goods sold for firm i ; and

$TA_{i,t-1}$ = prior year total assets for firm i (i.e. scaled total assets).

Therefore, the discretionary portion of accounts payable (i.e., UAP) is the difference between the actual accounts payable scaled by total assets ($AP_{i,t} / TA_{i,t-1}$) and $EAP_{i,t}$:

$$UAP_{i,t} = (AP_{i,t} / TA_{i,t-1}) - EAP_{i,t} \quad (2.27)$$

(4) Unexpected Accrued Liabilities (UACCL)

The first step, in computing UACCL is to compute expected (normal or non-discretionary) levels of accrued liabilities. Once computed expected accrued liabilities (EACCL), the discretionary portion of accrued liabilities (i.e., UACCL) is obtained by subtracting from the actual accrued liabilities (ACCL) the expected accrued liabilities (EACCL) value. The expected accrued liabilities (EACCL) value is computed as follows:

$$EACCL_{i,t} = (ACCL_{i,t-1} * SALES_{i,t} / SALES_{i,t-1}) / TA_{i,t-1} \quad (2.28)$$

where

$EACCL_{i,t}$ = expected accrued liabilities for firm i in year t ;

$ACCL_{i,t-1}$ = prior year accrued liabilities for firm i ;

$SALES_{i,t} / SALES_{i,t-1}$ = growth in sales for firm i ; and

$TA_{i,t-1}$ = prior year total assets for firm i (i.e. scaled total assets).

Therefore, the discretionary portion of accrued liabilities (i.e., UACCL) is the difference between the actual accrued liabilities scaled by total assets ($ACCL_{i,t} / TA_{i,t-1}$) and $EACCL_{i,t}$:

$$UACCL_{i,t} = (ACCL_{i,t} / TA_{i,t-1}) - EACCL_{i,t} \quad (2.29)$$

(5) Unexpected Depreciation Expense (UDEP)

Depreciation expense is presumed to remain a constant proportion of gross property, plant, and equipment (Marquardt and Wiedman 2004). The first step, in computing UDEP is to compute expected (normal or non-discretionary) levels of

depreciation expense. Once computed expected depreciation expense (EDEP), the discretionary portion of depreciation expense (i.e., UDEP) is obtained by subtracting from the actual depreciation expense (DEP) the expected depreciation expense (EDEP) value. The expected depreciation expense (EDEP) value is computed as follows:

$$EDEP_{i,t} = (DEP_{i,t-1} * Gross\ PPE_{i,t} / Gross\ PPE_{i,t-1}) / TA_{i,t-1} \quad (2.30)$$

where

$EDEP_{i,t}$ = expected depreciation expense for firm i in year t ;

$DEP_{i,t-1}$ = prior year depreciation expense for firm i ;

$Gross\ PPE_{i,t} / Gross\ PPE_{i,t-1}$ = growth in gross property, plant, and equipment for firm i ; and

$TA_{i,t-1}$ = prior year total assets for firm i (i.e. scaled total assets).

Therefore, the discretionary portion of depreciation expense (i.e., UDEP) is the difference between the actual depreciation expense scaled by total assets ($DEP_{i,t} / TA_{i,t-1}$) and $EDEP_{i,t}$:

$$UDEP_{i,t} = (DEP_{i,t} / TA_{i,t-1}) - EDEP_{i,t} \quad (2.31)$$

(6) Unexpected Special Items (USI).

Special items (SI) are by their nature non-recurring and thus are expected to equal zero (Marquardt and Wiedman 2004). Therefore, the unexpected (discretionary) portion of special items (USI) for firm i in period t corresponds to the level of special items itself. That is, the discretionary portion of special items (i.e., USI) equals the actual special items (SI) for firm i in year t , scaled by total assets ($SI_{i,t} / TA_{i,t-1}$)

$$USI_{i,t} = SI_{i,t} / TA_{i,t-1} \quad (2.32)$$

(c) A Model to measure real activities earnings management

Roychowdhury (2006) investigated patterns in (a) cash flow from operations (CFO), (b) production costs, calculated by adding to the cost of goods sold (COGS) the change in inventory, and (c) discretionary expenses, defined as the sum of advertising expenses, research and development (R&D) expenses, and selling, general and administrative (SG&A) expenses. Roychowdhury's (2006) model involves computing normal levels of these metrics (i.e., normal levels of CFO, normal production costs, and normal discretionary expenses). Deviations from the normal levels of these proxies are termed abnormal (i.e., abnormal CFO, abnormal production costs, and abnormal discretionary expenses). Normal levels of the variables are obtained using the model developed by Dechow et al. (1998). In particular, Roychowdhury (2006) expresses normal cash flow from operations as a

linear function of sales and change in sales in the current period. To estimate this model, he ran the following theoretical linear regression model, cross-sectionally for each industry and year:

$$CFO_{i,t}/TA_{i,t-1} = \alpha_0 + \alpha_{1i}(1/TA_{i,t-1}) + \beta_{1i}(SALES_{i,t}/TA_{i,t-1}) + \beta_{2i}(\Delta SALES_{i,t}/TA_{i,t-1}) + \varepsilon_{i,t} \quad (2.33)$$

where

$CFO_{i,t}/TA_{i,t-1}$ = cash flow from operations for firm i in the event year t scaled by total assets ($TA_{i,t-1}$) from the previous period;

$SALES_{i,t}/TA_{i,t-1}$ = sales for firm i scaled by total assets ($TA_{i,t-1}$) from the previous period;

$\Delta SALES_{i,t}/TA_{i,t-1}$ = change in sales (sales year t less sales year $t-1$) for firm i scaled by total assets ($TA_{i,t-1}$) from the previous period;

$\varepsilon_{i,t}$ = error term in year t for firm i ; and

α_0 , α_i , β_{1i} , and β_{2i} = regression parameters to be estimated.⁵⁴

For every firm-year, abnormal cash flow from operations is computed as the difference between actual CFO and the normal CFO calculated using estimated coefficients as in Eq. 2.33 from the corresponding industry year model (i.e., α_0 , α_i , $\beta_{1,i}$, and $\beta_{2,i}$) and company's specific data for the event year (firm-year's sales) lagged total assets.

Further, Roychowdhury (2006) defines production costs as the sum of cost of goods sold (COGS) and change in inventory (ΔINV) during the year. The model for normal COGS is estimated as follows:

$$COGS_{i,t}/TA_{i,t-1} = \alpha_0 + \alpha_{1i}(1/TA_{i,t-1}) + \beta_i(SALES_{i,t}/TA_{i,t-1}) + \varepsilon_{i,t} \quad (2.34)$$

where

$COGS_{i,t}/TA_{i,t-1}$ = cost of goods sold for firm i in the event year t scaled by total assets ($TA_{i,t-1}$) from the previous period;

$SALES_{i,t}/TA_{i,t-1}$ = sales for firm i scaled by total assets ($TA_{i,t-1}$) from the previous period;

$\varepsilon_{i,t}$ = error term in year t for firm i ; and

α_0 , α_i , and β_i = regression parameters to be estimated.

The model for normal inventory growth is estimated as follows:

$$\begin{aligned} \Delta INV_{i,t}/TA_{i,t-1} = & \alpha_0 + \alpha_{1i}(1/TA_{i,t-1}) + \beta_{1i}(\Delta SALES_{i,t}/TA_{i,t-1}) \\ & + \beta_{2i}(\Delta SALES_{i,t-1}/TA_{i,t-1}) + \varepsilon_{i,t} \end{aligned} \quad (2.35)$$

⁵⁴The first term α_0 is an unscaled intercept while the second term $\alpha(1/TA_{i,t-1})$ is a scaled intercept through prior-year total assets.

where

$\Delta INV_{i,t}/TA_{i,t-1}$ = change in inventory (inventory year t less inventory year $t - 1$) for firm i in the event year t scaled by total assets ($TA_{i,t-1}$) from the previous period;
 $\Delta SALES_{i,t}/TA_{i,t-1}$ = change in sales (sales year t less sales year $t - 1$) for firm i scaled by total assets ($TA_{i,t-1}$) from the previous period;
 $\Delta SALES_{i,t-1}/TA_{i,t-1}$ = prior year change sales (sales year $t - 1$ less sales year $t - 2$) for firm i scaled by total assets ($TA_{i,t-1}$);
 $\epsilon_{i,t}$ = error term in year t for firm i ; and
 α_0 , α_i , β_{1i} , and β_{2i} = regression parameters to be estimated.

Therefore, using Eqs. 2.34 and 2.35 normal production costs are estimated from the following industry-year regression:

$$PROD_{i,t}/TA_{i,t-1} = \alpha_0 + \alpha_{1i}(1/TA_{i,t-1}) + \beta_{1i}(SALES_{i,t}/TA_{i,t-1}) + \beta_{2i}(\Delta SALES_{i,t}/TA_{i,t-1}) + \beta_{3i}(\Delta SALES_{i,t-1}/TA_{i,t-1}) + \epsilon_{i,t} \quad (2.36)$$

where

$PROD_{i,t}/TA_{i,t-1}$ = production costs for firm i in the event year t scaled by total assets ($TA_{i,t-1}$) from the previous period;
 $SALES_{i,t}/TA_{i,t-1}$ = sales for firm i scaled by total assets ($TA_{i,t-1}$) from the previous period;
 $\Delta SALES_{i,t}/TA_{i,t-1}$ = change in sales (sales year t less sales year $t - 1$) for firm i scaled by total assets ($TA_{i,t-1}$) from the previous period;
 $\Delta SALES_{i,t-1}/TA_{i,t-1}$ = prior year change in sales (sales year $t - 1$ less sales year $t - 2$) for firm i scaled by total assets ($TA_{i,t-1}$);
 $\epsilon_{i,t}$ = error term in year t for firm i ; and
 α_0 , α_i , β_{1i} , β_{2i} , and β_{3i} = regression parameters to be estimated.

For every firm-year, abnormal production costs are computed as the difference between actual production costs (sum of the cost of goods sold and the change in inventory during the year) and the normal production costs calculated using estimated coefficients of Eq. 2.36 from the corresponding industry year model (i.e., α_0 , α_i , β_{1i} , β_{2i} , and β_{3i}) and company's specific data for the event year.

Finally, to estimate normal discretionary expenses, Roychowdhury (2006) uses the following regression for every industry and year:

$$DISEXP_{i,t}/TA_{i,t-1} = \alpha_0 + \alpha_{1i}(1/TA_{i,t-1}) + \beta_i(SALES_{i,t-1}/TA_{i,t-1}) + \epsilon_{i,t} \quad (2.37)$$

where

$DISEXP_{i,t}/TA_{i,t-1}$ = discretionary expenses for firm i in the event year t scaled by total assets ($TA_{i,t-1}$) from the previous period;
 $SALES_{i,t-1}/TA_{i,t-1}$ = lagged sales for firm i scaled by total assets ($TA_{i,t-1}$) from the previous period;
 $\epsilon_{i,t}$ = error term in year t for firm i ; and
 α_0 , α_i , and β_i = regression parameters to be estimated.

For every firm-year, abnormal discretionary expenses are computed as the difference between actual discretionary expenses (the sum of advertising expenses, research and development expenses, and selling, general and administrative expenses) and the normal discretionary expenses calculated using estimated coefficients of Eq. 2.37 from the corresponding industry year model (i.e., a_0 , a_i , $b_{1,i}$, $b_{2,i}$, and $b_{3,i}$) and company's specific data for the event year.

(d) Benford's (1938) Law to measure earnings management and financial irregularities.

Broadly speaking, Benford's Law reports how frequently a certain number appears in a naturally occurring empirical distribution. In artificially generated datasets, such as financial statements that had been manipulated through earnings management techniques, the numbers will, according to Benford's Law, not appear with the same frequency because "numbers in the financial statements are generated by economic agents who may have intent" (Amiram et al. 2014). More specifically, Benford's Law "states that the first digits of all numbers in a data set containing numbers of varying magnitude will follow a particular theoretical and mathematically derived distribution where the leading digits 1 through 9 appear with decreasing frequency" (Amiram et al. 2014, p. 36). Table 2.5 shows the Benford's theoretical (or expected) frequencies for leading digit from one to nine in a randomly generated data set.

To measure whether a dataset conforms to Benford's distribution Amiram et al. (2014) employ the Kolmogorov-Smirnov (KS) statistic:

$$K = \text{MAX}\{|AD_1 - ED_1|, |(AD_1 + AD_2) - (ED_1 + ED_2)|, \dots, |(AD_1 + AD_2 + \dots + AD_9) - (ED_1 + ED_2 + \dots + ED_9)|\} \quad (2.38)$$

where

AD = the actual digit, i.e. the actual frequency of the leading digits; and
ED = the expected digit, i.e. the theoretical frequency expected by Benford's distribution.

Table 2.5 Digits and frequencies

Leading digit	Theoretical distribution (%)
1	30.1
2	17.6
3	12.5
4	9.7
5	7.9
6	6.7
7	5.8
8	5.1
9	4.6

Adapted from Benford (1938)

Table 2.6 Simplified balance sheet (BS) of year n

BS item*	Euro	LD
Cash	150	1
Receivables	350	3
Inventories	1000	1
PPE	5000	5
Assets (other)	2000	2
Goodwill	35	3
Total assets	8535	8
Accounts payable	200	2
Long term debt	4000	4
Liabilities (other)	1000	1
Total liabilities	5200	5
Retained earnings	335	3
Equity	3000	3
Total liabilities + equity	8535	8

*Balance sheet items in euros. The first digit of each number is in bold. LD is leading digit

The maximum deviation from Benford's distribution, determined by the cumulative difference between the empirical distribution of the digits from one to nine and the theoretical distribution, is the KS statistic. After KS statistic has been determined, one has to compare it with the critical value. "To test conformity to Benford's distribution at the 5% level based on the KS statistic, the test value is calculated as $1.36/\sqrt{P}$, where P is the total number, or pool, of first digits used" (Amiram et al. 2014, p. 45). However, with a level of significance α at 10% and 1% the test values are respectively calculated as $1.22/\sqrt{P}$ and $1.63/\sqrt{P}$. An example will clarify.⁵⁵ Table 2.6 provides a simplified balance sheet while Table 2.7 shows the data needed to compute the KS statistic and the test value.

To test its conformity to Benford's Law, one has to take the first digit of each number, and count the occurrence of each digit. For example, in the balance sheet presented in Table 2.6, the number one appears three times as the first digit (in bold): cash (**1**50); inventories (**1**000), and Liabilities (**1**000). Since the total number of first digits used is 14 (Table 2.7, total column 'Count') the actual frequency of the leading digit one is $3/14 = 21.4\%$. The actual frequency of the leading digit two is $2/14 = 14.3\%$ (the number two has two appearances); the actual frequency of the leading digit three is $4/14 = 28.6\%$ (the number three has four appearances); the

⁵⁵I did not provide an example for other well-known earnings management detection tools (except for the Jones 1991 model) since it would have been redundant. However, in this case, an example might be useful because applications of Benford's Law in earnings management studies are uncommon. In the following example, I will use only a few items from the balance sheet. The interested reader should adapt this example and expand it to all financial data available for a company (e.g., income statement, statement of cash flows and the notes).

Table 2.7 Data to compute KS statistic and critical values

LD*	Count	AD (%)	ED (%)	CD (%)
1	3	21.4	30.1	8.7
2	2	14.3	17.6	12
3	4	28.6	12.5	4.1
4	1	7.1	9.7	1.5
5	2	14.3	7.9	7.9
6	0	0.0	6.7	1.2
7	0	0.0	5.8	4.6
8	2	14.3	5.1	4.6
9	0	0	4.6	0
Total of first digits used:	14			
KS:				12

*LD is leading digit. Count, is the number of occurrence of a digit. AD is the actual distribution (frequency). ED is the expected distribution (theoretical frequency). CD is the cumulative difference

actual frequency of the leading digit four is $1/14 = 7.1\%$ (the number four has one appearance); etc.

The test value for the sample balance sheet is 36.3% ($1.36/\sqrt{14}$). Since the computed KS statistic (the maximum cumulative difference computed with Eq. 2.38 is 12% (in bold, Table 2.7), less than the test value (36.3%), it fails to reject the null hypothesis that the empirical distribution follows Benford's theoretical distribution. In other words, there is no suspect of potential manipulation or earnings management.

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