



ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

The International Journal of Accounting 49 (2014) 27–52

The
International
Journal of
Accounting

Earnings Management in Business Groups: Tax Incentives or Expropriation Concealment? ☆

Christof Beuselinck^{a,*}, Marc Deloof^b

^a *IESEG School of Management, LEM, 3, rue de la Digue, 59800 Lille, France*

^b *University of Antwerp, Prinsstraat 13, 2000 Antwerp, Belgium*

Received 9 July 2012

Abstract

This study provides evidence that Belgian firms affiliated to a business group (*holding*) manage their earnings more than stand-alone firms. Earnings management is especially more prevalent in fully owned group firms compared to group firms with minority shareholders. This evidence is consistent with the hypothesis that controlling shareholders face fewer constraints to manage earnings if opportunistic earnings management cannot adversely affect the value of minority shareholders and is inconsistent with the claim that group firms would engage in earnings management to hide controlling shareholders' self-serving transactions. On the incentive part, we find that group firms strategically manage earnings in response to tax incentives. More specifically, we show that signed discretionary accruals of group firms depend significantly more on the marginal tax rate status of the firm as compared to independent firms. Finally, we document that earnings management is particularly facilitated through intra-group transactions.

© 2014 University of Illinois. All rights reserved.

JEL classification: G32; H26; M41

Keywords: Business groups; Earnings management; Marginal tax rate; Ownership structure

☆ Part of this research was completed when Christ of Beuselinck was affiliated to Tilburg University and Center (The Netherlands). The authors appreciate helpful comments from Rashad Abdel-Khalik (the Editor), an anonymous referee, Willem Buijink, Ignace De Beelde, Wouter De Maeseneire, Peter Joos, Laurence van Lent, Sophie Manigart, Hubert Ooghe, Maarten Pronk, Richard Sansing, Jeroen Suijs, Norman Strong, Ann Vanstraelen, Marleen Willekens, Cristiano Zazzara and seminar participants at Ghent University, Erasmus University Rotterdam and Tilburg University. We are particularly grateful to An Buyschaert and An Rommens for the help in the data collection. This paper has also benefited from presentations at the European Accounting Association conference (Göteborg), the Belgian Financial Research Forum (Antwerp), the Corporate Finance Day (Leuven) and the European Financial Management Association conference (Madrid). Financial support from the Fonds voor Wetenschappelijk Onderzoek (Grant n° G.0012.02) is kindly appreciated. This is a significantly revised version of the paper that circulated under the title "Business groups, taxes and accruals management". The usual disclaimer applies.

* Corresponding author.

0020-7063/\$ - see front matter © 2014 University of Illinois. All rights reserved.

<http://dx.doi.org/10.1016/j.intacc.2014.01.008>

1. Introduction

In this study, we examine the effect of business group affiliations on earnings management decisions. While prior literature typically explains earnings management in business groups as a way to disguise value expropriation at the expense of minority shareholders (e.g., [Gordon & Henry, 2005](#); [Kim & Yi, 2006](#)), we evaluate the importance of an alternative motivation, namely taxation. We define business groups as the network of parent and subsidiary firms structured in holding groups. In a typical holding, the parent firm is explicitly organized for the purpose of owning a controlling interest in other firms which then *de jure* become the holding firm's subsidiaries. Holdings have been dominant in many economies worldwide and have been disputed for their opaque ownership structures as well as applauded for their economic purposes ([Bertrand, Mehta, & Mullainathan, 2002](#); [Claessens, Fan, & Lang, 2006](#)).¹

Holding group membership may yield a number of benefits for the parent as well as for affiliated firms. First, parent companies do not need to obtain 100% share ownership for taking control, thereby reducing the minimum investment needed to obtain control over a subsidiary compared to a typical M&A transaction. Also, parent companies can expand their debt capacity since shares of stock in subsidiaries are recorded as parent-level assets and treated as collateral in loan agreements. Relying on the extended debt capacity of the parent, holding subsidiaries can rely on internal capital markets to finance their activities, which make them potentially less dependent on external financiers than stand-alone firms ([Claessens et al., 2006](#); [Gramlich, Limpaphayom, & Ghon Rhee, 2004](#)). From a management perspective, decentralized management and cross-pollination between professional group staff services are seen as additional advantages of business groups ([Banerjee, Leleux, & Vermaelen, 1997](#)).

Holdings provide another set of features, however, that are particularly interesting from a group perspective. First, holdings are typically structured through a myriad of complicated networks, which provide group members with substantial discretionary tools and flexibility to manage earnings through related-party transactions. As a consequence, holdings may have more tools as well as more opportunities to manage earnings compared to stand-alone firms ([Jian & Wong, 2010](#)). Furthermore, holdings are potentially appealing from a tax-minimizing perspective in that losses of one subsidiary can be used to offset profits from another subsidiary, thereby reducing the overall taxes paid.²

Despite the unique earnings management potential in business groups, only scarce international evidence exists on this matter. An exception is the study of [Kim and Yi \(2006\)](#), which documents that Korean firms affiliated with a *Chaebol* group engage more in opportunistic earnings management than non-affiliated firms. Kim and Yi argue that

¹ Although holding is the common name for a business group in Continental Europe, they are also referred to as Gruppo (in Italian) and Konzerns (in German). This different typology is purely linguistic and the aforementioned business groups all refer to organizational forms that “*actively monitor and control a network of industrial and financial firm entities*” ([Banerjee et al., 1997](#)).

² Note that fiscal consolidation or group taxation as being applied in certain large economies like the U.K. or the U.S. would automatically result into offsetting of losses and profits across the business group. In the current paper, we argue that even without the existence of group taxation – as was the case in Belgium over the period of study – business groups are able to reduce their group tax bill. We elaborate on the specifics of the corporate taxation in Belgium in [Section 2.2](#). and explain the motivations for expecting higher earnings management in business groups in [Sections 3.1 to 3.2](#).

group-affiliated firms have both more instruments and opportunities available than unaffiliated firms to divert firm resources at the expense of minority shareholders, and that the controlling shareholders of group firms manage earnings to hide these diversions at the expense of minority shareholders, thereby avoiding disciplinary actions. However, Kim and Yi do not consider tax minimization or other objectives as alternative explanations for earnings management in business groups.

Studies on tax-minimizing strategies in business groups include examples like Gramlich et al. (2004), who document that Japanese *Keiretsu* firms capitalize on group affiliations by shifting taxable income between group members, thereby minimizing the tax burden at the group-level. Income shifting at non-market prices between group members can result in tax minimization when two or more affiliated firms with a differential tax status shift income from profitable entities to loss-making entities (Scholes, Wolfson, Erickson, Maydew, & Shevlin, 2002). Gramlich et al., however, do not consider the relation between discretionary earnings management and taxation. In the current study, we combine both lines of research and extend it by testing for the predominance of a tax-based explanation compared to a minority interest expropriation explanation for earnings management. In addition, we consider the importance of intra-group (i.e., related-party) transactions in contributing to the earnings management activities.

Our analyses are based on fiscal entity firm-level data of Belgian group firms, i.e. firms that are majority-controlled by a listed holding company and legally are seen as subsidiaries, over the period 1997–2002. Belgium is an interesting setting to study earnings management in business groups for several reasons. First, business groups controlled by holding companies historically have played an important role in Belgium and represented a significant fraction of economic activity in Belgium as well as in other Continental European countries (Becht, Chapelle, & Renneboog, 2001).³ Second, Belgium is one the few European countries where private entities – even those that are not consolidated into larger business groups – are legally obliged to submit annual reports on a yearly basis to the National Bank of Belgium (by Royal Decree of 8 October 1976). This allows us to compare earnings management of group firms with those of stand-alone entities. Third, tax incentives for earnings management are non-trivial in Belgium, because of the close link between financial reporting and tax reporting (e.g. Coppens & Peek, 2005; Vander Bauwhede, Willekens, & Gaeremynck, 2003). This creates a strong experimental setting for testing the importance of taxation in the existence of business groups. Also, whereas consolidated group taxation is practiced in many countries worldwide, this is not the case in Belgium, where firms are taxed individually (Fédération des Experts Comptables, 2001).⁴ This specific tax code characteristic enables us to study fiscal-entity level earnings management in relation to tax motivations for various member firms that are affiliated to a listed holding group. The combination of these institutional and firm-specific characteristics provides a distinctive setting for examining the

³ Becht et al. (2001) report that about 40% of all Belgian firms listed in the mid 1990s were industry-diversified holdings, and their capital market capitalization represented over 25% of the entire Belgian stock market.

⁴ When taxes are determined at the consolidated group level, groups do not have to shift income across individual group members for minimizing overall taxes. Profits of some group members then are automatically compensated at the consolidated level by the losses of other group members.

inclination of group firms to manage firm-level earnings via discretionary accruals and to test for the importance of taxation versus minority interest shareholder expropriation arguments.

We measure earnings management by applying the modified Jones (1991) model as per Dechow, Sloan, and Sweeney (1995) and study the unsigned (*AbsDACC*) and signed (*DACC*) discretionary accruals. For the unsigned accruals tests, which test for the incidence and magnitude of earnings management, we find that group-affiliated firms manage earnings more than non-affiliated firms. Furthermore, we find that the results are more pronounced for fully-owned group firms compared to group firms with minority shareholders. This finding is consistent with the hypothesis that group firms have more opportunities to manage earnings compared to independent firms but is inconsistent with the argument that group firms would especially engage in earnings management to hide controlling shareholders' self-serving transactions. On the incentive part, our signed discretionary accruals results suggest that group firms manage earnings especially from a tax-minimizing perspective. More precisely, we find that discretionary accruals of affiliated firms are significantly more negative (positive) compared to independent firms when the affiliated firm faces a positive (zero) marginal tax rate. Finally, we show that subsidiary firm-level discretionary accruals are positively related to the relative proportion of intra-group credit sales versus total credit sales. This suggests that group affiliation centrality, i.e. the extent to which business operations are executed within the holding network, facilitates earnings management activities.

Our study contributes to the developing domain of financial reporting behavior within business groups and goes beyond the typical examinations of costs and benefits of business groups (Gopalan, Nanda, & Seru, 2007; Gramlich et al., 2004). The current study is unique in that we are among the first examining firm-level discretionary accruals management activities in non-financial business groups and testing at the same time for the predominance of tax incentives versus minority interest expropriation as a key driver for the observed earnings management. Our results indicate that in a Western market economy, holdings do not resort to earnings management to obfuscate potential value expropriation activities but that earnings management is nevertheless taking place for tax minimizing purposes. To the best of our knowledge, this is also one of the first studies documenting the importance of intra-group accruals contributing to earnings management within business groups. As such, it provides direct evidence for other studies arguing that complex business structures have unique features to obfuscate financial reporting quality (Kim & Yi, 2006; Rego, 2003).

The remainder of our study is as follows: Section 2 discusses institutional features about Belgian business groups and provides necessary insights in the Belgian financial accounting and tax code. In Section 3, we summarize related literature and formulate our hypotheses. Section 4 describes the sample and Section 5 discusses the variables used in the empirical analyses. Regression results and robustness checks are presented in Section 6. Finally, Section 7 summarizes and concludes the study.

2. Business groups, taxes, and financial reporting laws in Belgium

2.1. Business groups

Industry-diversified business groups represent a substantial proportion of the world economy, in emerging markets as well as in developed countries. In Belgium as well as in

other Continental European countries, holdings (business groups) typically consist of layers of quoted and non-quoted holding companies, in which ultimate shareholders control a multitude of companies through complex cross-holdings and pyramidal structures (Faccio & Lang, 2002). Holding companies can be defined as “...*professionally managed institutions that own a portfolio of stocks in public and private companies with the purpose of influencing them. In realizing this objective, a holding company acts both as a financial intermediary and as an active shareholder.*” (Banerjee et al., 1997).

The importance of Belgian business groups, based on holding company structures, should be seen in its historical context. In a reaction to the worldwide financial crisis at the beginning of the 1930s, a banking law was introduced in 1934 forcing universal banks, which dominated the Belgian economy in the 19th century, to separate their banking and investment activities. This had led to the creation of so-called holding companies, i.e. conglomerated business groups, owning a diversified portfolio of investments in a wide range of industrial and commercial activities. These holding companies remained the largest active shareholders in Belgium throughout the 20th century (Daems, 1978).⁵ Pyramidal ownership structures allowed them to maintain control over their subsidiaries with only limited investments and cash flow rights. In recent times, Belgian holding companies remain important investors in financial, industrial and commercial companies. About 30% of all Belgian firms listed in the mid-1990s were industry-diversified holding groups, and their capital market capitalization represented about 25% of the entire Belgian stock market (Becht et al., 2001).

Several potential rationales have been put forward for the omnipresence and importance of business groups both in developed and in developing countries. Agency problems may be reduced in business groups through a better alignment of risk bearing and control (Claessens et al., 2006). Bankruptcy costs may be lower through facilitating renegotiations with creditors in distress situations (Banerjee et al., 1997). Group-affiliation can also induce a positive group (*co-insurance*) effect for group members resulting in easier access to external financing (Ferris, Kim, & Kitsabunnarat, 2003).

The existence of internal capital markets is another important justification for business groups. Diversified groups may have means and resources to (re)allocate capital among affiliated firms, which can result in economic benefits especially when external financing is scarce or uncertain (Claessens et al., 2006). Holding companies could improve overall managerial efficiency since professional advice and expertise are facilitated through related business parties. Yet another explanation for the omnipresence of business groups is the flexibility of groups to minimize taxes (Gramlich et al., 2004; Scholes et al., 2002). In an institutional setting where corporate taxes are paid at the firm level (as is the case in Belgium), business groups can reduce overall tax payments by carefully allocating profits and losses across tax-exempt and taxable group members.

⁵ These holding groups are to some extent similar to Japanese keiretsu groups, but there are also noticeable differences. While keiretsu member firms are centered around a main bank that is both a significant shareholder and a creditor to member firms, holding group members are typically part of a wide network of industrial and financial groupings (Becht et al., 2001). Holdings typically also play an active role in the daily management of the firm they control, while keiretsu firms do not have explicitly defined central control. Furthermore, it is common practice that holdings strictly supervise the operations, finance and business strategies of group members (e.g. Buysschaert et al., 2008).

2.2. Taxes and financial reporting laws in Belgium

During our observation period 1997–2002, Belgian firms reporting a non-zero positive taxable income were taxed at a statutory tax rate of 40.17%. This percentage contains 39% basic statutory corporate tax on taxable income, plus a 3% (of 39%) austerity surcharge (i.e. a surcharge, introduced by the Belgian government in 1993 for budgetary reasons).⁶ Fiscal consolidation is not allowed in Belgium. Taxes are levied at the individual affiliate level and *not* at the consolidated business group level (OECD, 2004). Belgian holding groups therefore do not automatically benefit from the leveling out of positive and negative income numbers from group members in their average tax bill.

In addition, tax reporting and financial reporting are closely linked in Belgium (Coppens & Peek, 2005).⁷ In essence, taxable income is derived from the accrual accounting income but needs to be adjusted on several elements for permanent and timing differences. These differences can occur because of a number of reasons. For instance, differences in depreciation rules can make assets over- or understated according to tax rules, specific expenses relating to pension schemes or capital losses on shares are not tax-deductible, and losses can be carried forward *ad finitum*.

To provide some further background on the Belgian tax system, we summarize a number of its central features. Inventory valuation is done at lower or cost of market and allows all four valuation methods that are used in financial accounting methods, including LIFO methods. Business assets are depreciated on a yearly basis and the depreciation rate is typically calculated on a straight-line basis. However, declining-balance method and accelerated depreciation methods are allowed under law and specific rulings. Capital gains on disposal of business assets are taxed at the standard corporate income rate although capital gains on share transactions are not taxable at all. Carry-forward of losses applies unlimited in time but carry-backward of losses is not allowed.⁸ Investment tax incentives are granted for various initiatives, such as (1) accelerated depreciation for qualifying assets acquired by economic sectors of major importance to the Belgian economy, (2) double straight-line depreciation for SMEs, (3) deductions for investments in new technology or recycling products, (4) tax credits for research and development, and (5) so-called coordination centers, carrying out specific activities like advertising, insurance and centralization of financial transactions of multinational groups.

Furthermore, the Belgian tax system accepts tax-free reserves and provisions for expected losses on accounts receivable. Actual write-offs are not a prerequisite to claiming such a tax deduction if provisions relate to specific costs that burden the result. Moreover, bad debt provisions are not subject to specific predefined ceilings. Also, taxes can be deferred by claiming reserves of certain types of unearned income for goods and/or services not rendered on

⁶ Note that firms with a pre-tax income not exceeding EUR 322,262 were subject to a reduced and gradually imposed statutory tax rate of 28% on a pre-tax profit between EUR 0 and EUR 24,789; 36% on the pre-tax profit between EUR 24,790 and EUR 89,242 and 41% on the pre-tax profit between BEF 89,243 and EUR 322,262.

⁷ For a study on the importance of earnings management objectives when tax and financial accounting are closely linked, we refer to Eilifsen, Knivsflo, and Soettem (1999).

⁸ Although carry backward of losses is common practice in the U.S. and the U.K., most Continental European countries do not allow firms to carry losses backward. Exceptions are France (three years, with certain limitations) and Germany (two years). Unlimited carry forward of losses in Europe, next to Belgium, is allowed in Germany, Ireland, Luxembourg, The Netherlands, Sweden and the U.K. (OECD, 2004).

the moment of the tax calculation. In summary, the high alignment between tax and financial accounting income on also the inventory valuation, receivables, current and contingent liabilities justifies the focus on financial accounting as a proxy for the taxable income and warrants that Belgian managers have substantial discretion over the extent and timing of accruals used in calculating taxable income.

3. Hypotheses

3.1. *Business groups and earnings management*

The earnings management literature (e.g. Healy & Wahlen, 1999) discusses several accrual components through which firms may manage earnings, such as bad debt estimates; inventory valuations; changing depreciation policy; or revenue recognition. Firms may also switch to real earnings management, for example by offering price discounts to boost sales, or by cutting back R&D to achieve earnings targets (Roychowdhury, 2006). It can be argued that group affiliations provide firms with extra flexibility compared to stand-alone entities to manage earnings via related-party transactions. Gordon and Henry (2005) study related party transactions between U.S. firms and their executives and board members and find a positive association between these transactions and the extent of earnings management. Jian and Wong (2010) document that Chinese listed firms realize earnings objectives via cash-based and accruals-based related-party sales “propping.” Furthermore, a number of studies have documented that within business groups, profitable affiliates cross-subsidize poorly performing group member through various related party transactions like cash injections, equity investments, or loan guarantees (e.g. Bertrand et al., 2002; Buyschaert, Deloof, Jegers, & Rommens, 2008; Chang & Hong, 2000).

The existence of these related-party structures suggests that group firms have not only more opportunities but also more instruments available compared to stand-alone firms to manage earnings. Group-facilitated earnings management may work via group-orchestrated acquisitions and sales; credit purchases and sales; and payables and receivables accounts (Jian & Wong, 2010). Illustrations include bill-and-hold sales orchestrated at the group level or synthetic structuring of sale-and-lease back transactions across affiliate firms.⁹ In our first hypothesis, we test for the existence of such a relationship in the Belgian setting as follows:

H1. *Ceteris paribus*, group firms manage their earnings more than stand-alone firms.

3.2. *Business groups, earnings management, and ownership*

An extended literature has documented that group structures often lead to a separation of ownership and control of the controlling shareholders. Consequently, controlling shareholders may be induced to divert or “tunnel” resources out of companies in which they have low cash

⁹ We refer to Nelson, Elliott, and Tarpley (2003) for comprehensive auditor survey evidence on earnings management actions. While Nelson et al. do not explicitly mention that the observed earnings management actions are occurring more in business groups compared to stand-alone firms, we rationalize that consignment sales, end-of-year manipulations, and the design of tax-optimal intra-group transactions (such as group-orchestrated sale-and-lease back transactions) are more easily available than for to stand-alone firms.

flow rights to firms in which they have high cash flow rights, which comes at the expense of minority shareholders (Bertrand et al., 2002; Johnson, La Porta, Lopez-de-Silanes, & Shleifer, 2000). Moreover, the complex ownership structure of the groups makes it difficult for the minority shareholders to monitor intra-group transactions (e.g. Buyschaert, Deloof, & Jegers, 2004). It may therefore be easier for firms belonging to a group to divert resources through related-party transactions at the expense of the non-controlling shareholders than for stand-alone firms to do so.

Kim and Yi (2006) argue that group firms may particularly engage in opportunistic earnings management to hide such controlling shareholders' self-serving transactions. In their study on Korean firms, they document a significantly larger magnitude of earnings management by firms with a higher disparity between cash flow rights and ownership rights, and by firms which belong to a Chaebol group.¹⁰ In the current study, we reinvestigate and extend this line of research and formulate expectations on group ownership features and earnings management strategies. In particular, we explicitly distinguish between group firms that are fully (100%) owned by the group, and group firms that are majority-controlled but not fully owned (i.e., with minority interests) by the group. Studying earnings management across variations of minority shareholdings may clarify the value expropriation versus tax minimization argument.

We run a horse-race between two competing hypotheses. The first one is that controlling shareholders may face fewer constraints to manage earnings in a fully-owned subsidiary, in particular because opportunistic earnings management actions cannot then adversely affect the value of minority shareholders. This makes it more likely that fully-owned subsidiaries are involved in strategic earnings management decisions compared to non-fully-owned subsidiaries, since non-economic value transfers between subsidiaries (in the form of group-related earnings management) may trigger suspicion and recursive actions by minority shareholders. As a consequence, one may hypothesize that fully-owned subsidiaries are more likely to be involved in earnings management within the group than subsidiaries with minority shareholders.

However, we cannot rule out the possibility that firms belonging to a Belgian business group primarily engage in earnings management to hide the diversion of resources for non-controlling shareholders (as in Kim & Yi, 2006). If this is the case, fully-owned affiliated firms would engage less in earnings management than other group firms. Indeed, if a group firm has no minority shareholders, there is no reason to engage in earnings management to hide the diversion of resources by the controlling shareholders. Combined, these arguments make the relation between group ownership proportions and earnings management an empirical issue and leads to the following hypotheses, stated in alternative form.¹¹

H2a. *Ceteris paribus*, earnings management is more prevalent in fully-owned group firms compared to other group firms.

¹⁰ At a more general level, Leuz et al. (2003) follow the same reasoning in explaining why country-level earnings management is more pervasive in countries with low levels of investor protection.

¹¹ Note that our hypotheses do not contradict the Kim and Yi (2006) arguments but rather focus on alternative motives for business groups to manage earnings.

H2b. *Ceteris paribus*, earnings management is less prevalent in fully-owned group firms compared to other group firms.

3.3. *Business groups, earnings management, and tax minimization*

One important reason why firms potentially manage earnings is to minimize the tax bill. The joint importance of financial contracting and other motivations, however, often hampers researchers in finding clear evidence of tax-avoiding reporting behavior (Fields, Lys, & Vincent, 2001). An exception may be found in the research on socially responsible firms where extant theories suggest that for legitimacy purposes, firms with high corporate social responsibility objectives promote more compliance with tax laws. In a recent study, Lanis and Richardson (2012) indeed document a negative association between corporate social responsibility scores and tax aggressiveness. Other examples are found in settings of corporate tax rate changes that affect firm incentives for realizing versus deferring corporate income. Guenther (1994), for instance, shows that U.S. firms have significantly lower (current) accruals in the year before the tax rate decreases. Roubi and Richardson (1998) document similar evidence for an international sample of Canadian, Singaporean, and Malaysian firms.¹²

Turning back to the importance of non-tax costs in a firm's earnings management decision, Burgstahler, Hail, and Leuz (2006) document international evidence that, also for private firms, non-tax costs may impede earnings management decisions. That is, even in the absence of capital market pressures, private firms may still want to obfuscate firm performance because they fear creditor intervention in the case of worsening financial performance. However, the importance of non-tax costs may be less of an issue for group firms since these can rely on internal capital markets to finance their business operations (Shin & Stulz, 1998). This will make them potentially less concerned about their reported individual profitability for financial contracting matters and increases their flexibility in managing earnings to minimize taxes.

Prior studies on tax avoidance in multinational corporations suggest that internationally diversified business groups make use of tax differences across countries through intra-company transactions to reduce the overall tax rate (e.g. Collins, Kemsley, & Lang, 1998; Jacob, 1996; Mills & Newberry, 2004; Rego, 2003). These studies examine income shifting by looking at cross-jurisdictional tax-avoidance activities of U.S. multinational corporations and find that multinationals allocate revenues to low-tax countries and expenses to high-tax countries to reduce average tax burdens. Moreover, group membership may result in economies of scale for group affiliates' expertise, potentially providing corporate insiders with more experience and discretionary tools to manage earnings for tax reasons (Mills, Erickson, & Maydew, 1998).

Firms related through business groups and operating in the same jurisdiction, which are taxed at the individual firm level, may also shift income to minimize taxes (Scholes et al., 2002). Nevertheless, empirical evidence on income shifting within one jurisdiction is relatively rare. An exception is Gramlich et al. (2004), who find that Japanese keiretsu firms face lower

¹² Note that Roubi and Richardson (1998) find strong results for companies from Canada and Singapore but weaker results for Malaysian companies.

effective taxes than stand-alone firms and that this tax reduction likely is a result of intra-group income shifts.¹³ In a related study, Jung, Kim, and Kim (2009) provide similar evidence for Korean Chaebol groups.¹⁴ However, neither of these studies explicitly investigates earnings management behavior in group-affiliated firms.

In the current study, we move beyond the often-visited examination of income shifting via non-market based transfer prices and explicitly study whether discretionary earnings management contributes to group firms' tax minimizing reporting objective. In line with our theoretical development above, we formulate our third hypothesis as follows:

H3. *Ceteris paribus*, group firms manage earnings more than stand-alone firms in order to reduce taxes.

4. Sample

The sample used in this study contains Belgian non-financial and non-utility firms that are affiliated with a business group (holding) or are independent. The group firms belong to one of the 16 Belgian business groups controlled by a holding company that are listed on Euronext Brussels in 2002.¹⁵ Holding companies have been dominating the Belgian economy for more than a century and they still represent a substantial portion of the entire market capitalization at Euronext Brussels. To identify firms that belong to a group we manually screened the annual reports of holding companies to identify all Belgian firms that are fully or proportionally consolidated with one of the listed holdings in our sample. If one of these firms had a consolidated report itself, all its Belgian subsidiaries were also incorporated in the group firms' sample. This technique allowed us to construct the myriad of firms in the pyramidal structure of each holding company.

We then consulted the 2003 edition of Belfirst®, the Bureau Van Dijk database containing financial statement information on all listed and unlisted Belgium firms, to acquire financial

¹³ Other evidence of intra-group tax avoidance firm behavior is found in Ferris et al. (2003), who indirectly refer to this behavior by studying the costs and benefits of Korean Chaebols. They find that chaebol member firms enjoy lower tax burdens than non-affiliated firms and explain this finding by the co-insurance effect of chaebol groups leading to larger debt capacities of member firms. Ferris et al. (2003), however, do not explicitly control for other firm characteristics that might drive their findings. Gramlich et al. (2004), by contrast, explicitly study tax differences between keiretsu and control firms and take other variables into account to corroborate their findings.

¹⁴ For completeness, we hasten to add that other studies on *intertemporal* income shifting within one jurisdiction exist. These studies, however, are typically looking at income shifts around anticipated reductions in tax rates, such as the U.S. Tax Reform Act of 1986. Scholes, Wilson, and Wolfson (1992), for instance, document that over 60% of U.S. firms deferred income and accelerated expenses in anticipation of the declining 1987 and 1988 tax rates, resulting into a 20 billion USD of inter-temporal shifted sales. We however, do not focus on *intertemporal* income shifts but rather rely on group structures to test for discretionary earnings management that is consistent with tax-motivated reporting strategies.

¹⁵ We choose 2002 since this is the most recent year where a substantial number of holding companies are still publicly listed. Since 2002, about one third of the listed holding companies in our sample delisted from Euronext Brussels. The annual report of non-listed holdings typically has insufficient disclosure on group structures to identify a truthful representation of holding pyramidal structures for a large number of groups in more recent years. Although the reason for delisting is an interesting phenomenon itself, the financial press believes that the increasing demand for more disclosure requirements from stock exchanges potentially triggered holdings to delist (De Tijd, December 10 2003). We limit the search to the 1997–2002 period because in earlier years the information available in annual reports is not comprehensive enough to identify the group structures.

statement information on the identified group firms. We further required that all sample group firms for which we estimate the earnings management behavior are private (i.e. not publicly listed) and report a complete financial statement for at least two years over the observation period.¹⁶ We only included a firm-year observation if (i) the firm has a “normal” legal status in that specific year (i.e. the firm is operating in a going-concern way and is not involved in any potential restructuring activity like M&A, buy-out, or bankruptcy), (ii) the firm is older than one year at time *t*, and (iii) sales and total assets are non-zero in the year of interest and in the preceding year.¹⁷

We further require non-missing information on carry-forward losses and taxable profit of the year in order to estimate a firm’s marginal tax rate (*MTR*) status (see Section 5.3 for a description on *MTR* calculations). Finally, after inclusion of data requirements for calculating (discretionary) accruals components, we have a final sample of 384 group firm-year observations corresponding to 199 individual group firms, belonging to 16 different holding groups.

Table 1 reports consolidated total assets, number of subsidiaries, and number of fully-owned (100%) subsidiaries included for each group in the sample. The number of sample companies for each group ranges between 1 (*Deficom*) and 50 (*Ackermans & Van Haaren*). For most groups, the number of sample companies is less than the total number of companies they controlled because foreign affiliates, financial companies, and companies for which only an abbreviated annual report was available were left out of the sample. We exclude foreign affiliates to avoid confounding effects of differences in GAAP across EU countries and statutory tax rates. Financial affiliate firms are excluded because of their highly specific reporting format. Finally, we remove affiliates with abbreviated reports because these lack essential information to estimate the discretionary accruals components. Consolidated total assets of the holding groups range between 35 million Euro (*Floridienne*) and 3789 million Euro (*Almanij*). Thirty-nine of the group firms (about 20%) in the sample are fully owned by the group.

To identify stand-alone firms, we selected all other firms included in Belfirst® that comply with the selection requirements as described above over the observation period and that are classified as stand-alone firms, based on the Bureau Van Dijk classification criterion. This criterion labels a stand-alone firm as “*any firm in which recorded shareholders have no more than 24.9% of direct or total ownership.*” We also excluded all companies that were not removed from the sample based upon the stand-alone criterion but which nevertheless reported group liabilities, group receivables, or group guarantees. The purpose of this last restriction was to exclude any company that is misclassified as independent although in reality has some related-party components. This resulted in a control sample of 5084 stand-alone firm-year observations (1698 firms).

¹⁶ We leave listed group-affiliated firms out of the sample because none of the stand-alone firms in our final sample was listed either. Note that the number of listed non-financial firms in Belgium was very limited (about 150 firms) in the period considered in this study.

¹⁷ We also removed all observations (55 firm-year observations) of so-called coordination centers (NACE industry-code 74152) as these business constructs are granted a lower statutory tax rate by law compared to standard business entities.

Table 1

Holding companies represented in the sample.

Holding company (in alphabetical order)	Consolidated total assets (1000 Euro)	No. of subsidiaries	Fully-owned subsidiaries
Accentis	64,350	24	4
Ackermans & Van Haaren	1,007,952	50	3
Almanij	3,788,864	43	0
Atenor	103,890	7	4
Auximines	398,615	2	0
Compagnie Benelux Paribas	3,448,940	6	1
Compagnie Bois Sauvage	329,217	2	0
Compagnie Nationale à Portefeuille	2,662,060	25	19
Deficom	78,739	1	0
Financière de Tubize	486,999	4	0
Floridienne	35,275	3	1
Mitiska	117,005	12	3
SCF	412,924	3	1
Société Financière des Caoutchoucs	51,543	3	1
Solvac	206,056	12	0
Unibra	66,611	2	2
Total		199	39

This table reports characteristics for the 16 business groups holding companies considered in this study. *Consolidated Total Assets* is the 2001 consolidated total assets figure of the group, expressed in 1000 Euro. *No. of Subsidiaries* is the number of firms controlled by the ultimate holding company that are included in the sample. *Fully-Owned Subsidiaries* is the number of firms included in the sample that are fully (100%) owned by the group.

5. Research design and descriptive statistics

5.1. Earnings management

We investigate the determinants of earnings management, taking into account the firm-level marginal tax rate status and group affiliations. As in prior studies, we measure earnings management by discretionary accruals (DACC), where DACC are the firm-specific residual of running yearly 2-digit industry regressions as in the modified Jones (1991) model (Dechow et al., 1995). The absolute value of discretionary accruals $Abs(DACC)$ measures the magnitude of earnings management per firm, while DACC captures the signed earnings management per firm-year. More information on the discretionary accruals estimation procedure is provided in Appendix 1.¹⁸

¹⁸ In the discretionary accruals calculations, group receivables are included in the left-hand side variable (Total Accruals), as well as in the right-hand side variable (Receivables-adjusted Sales: $\Delta Sales - \Delta REC$). While one may be concerned that intra-group receivables are not at the disposal of independent firms (a claim that we also make in the paper), thereby potentially leading to inconsistency in the accruals estimation process for group versus independent firms, we suggest to include them in the estimation process. One reason is that we explicitly want to test for the full effect of receivables (=intra-group and other) on earnings management for group versus control firms. Another important reason is that the modified Jones (1995) model assumes that *all* credit sales in each period are discretionary, inducing a positive correlation between discretionary accruals and current sales growth (Dechow, Richardson, & Tuna, 2003). Eliminating intra-group receivables from the estimation process therefore would distort the aforementioned associations unequally across group and independent firms.

5.2. Group affiliations

To distinguish between group and stand-alone (independent) firms, we use a *Group* dummy which equals one for group firms and zero for stand-alone firms. *Full_Own* is a dummy which equals one if a group company is 100% owned by the group, and zero otherwise.¹⁹ We also use *Group_Rec*, which is measured as intra-group receivables scaled by lagged total assets, as a proxy for group ties. [Verschueren and Deloof \(2006\)](#) document large variations in the use of intra-group debt and intra-group guarantees by Belgian group firms, which suggest that not all group firms are equally central to the group structure. A high value for *Group_Rec* suggests that the firm is more central to the group and that group goals may more likely play a crucial role in firm-specific reporting.

5.3. Marginal tax rate status

We proxy for firm-level tax costs of earning additional income by estimating a firm's marginal tax rate (*MTR*) status, which is defined as the increase in tax payments as a result of earning one extra currency unit of money ([Scholes et al., 2002](#)). The identification of the factual *MTR* requires the valuation of a firm's net operating loss deduction through simulations of future earnings streams. [Graham \(1996\)](#) and [Plesko \(2003\)](#), however, show that simulation results have a very high positive correlation with tax rates based on perfect foresight. [Plesko \(2003\)](#) also shows that a simple dummy (or trichotomous) variable based on the presence of net operating losses is highly correlated with a firm's real *MTR* status. [Lin, Rui, and Zhang \(2012\)](#) follow a similar approach in studying earnings management around the 2007 New Enterprise Income Tax Law in China.

In this study, we apply a binomial approach to model a firm's *MTR* status under Belgian tax laws. Because the Belgian tax code allows losses to be carried forward ad infinitum (see [Section 2](#) for more details), firms are likely to face positive *MTRs* (i.e. pay extra taxes if pre-tax profit increases) if the firm's pre-tax result is positive and exceeds the total value of all cumulative loss carry-forwards. By contrast, firms reporting a pre-tax loss or firms reporting a pre-tax profit being insufficient to offset the loss carry-forward are labeled as zero *MTR* ($MTR = 0$) firms. Having a positive (zero) *MTR* status is therefore a key criterion in a tax-minimizing framework as it influences the ability of firms to report positive pre-tax profits combined with zero or low effective taxes paid.²⁰ To the extent that group firms face less financial contracting costs and can focus more on tax minimization reporting strategies compared to stand-alone firms, group firms may manage earnings more than stand-alone firms to adjust taxable profits downward (upward) for positive (zero) *MTR* firms.

¹⁹ As a robustness check, we used a dummy variable that equals one if a group company is at least 95% owned by the group instead, but the results for this alternative measure are entirely consistent with those for the Fully-Owned (=100%) dummy.

²⁰ Please note that our *MTR* proxy is very similar to the one applied in [Klassen, Pittman, and Reed \(2004\)](#). As a robustness check, we construct the tax status variable as developed in [Klassen et al.](#) and set it equal to 1 if the firm has (a) no loss carry-forwards and (b) positive pre-tax income; 0.5 if the firm has either (a) or (b); and 0 if the firm has neither (a) nor (b). All results are qualitatively similar when we introduce this alternative tax status variable.

One potential concern about the *MTR* variable is that observed tax rates are the product of earnings management, and not the input of it. In other words, *MTR* status may be endogenous to earnings management because shifting profits to loss making group members may pull them out of the loss status, hereby minimizing the overall tax base. However, it seems highly unlikely that earnings management is generally sufficient to pull loss making group members out of the loss status, since this may yield intensified scrutiny from tax authorities and increase the likelihood of severe tax audits. Therefore, it seems warranted to assume that *MTR* status is exogenous to group member earnings management.

5.4. Control variables

We control for other determinants of earnings management identified in prior earnings management research by including proxies for firm size, leverage, growth, operating cash flow, age, industry-effects, and year effects in the empirical model. These variables are included to control for the heterogeneity of firms' business processes and could affect the magnitude and properties of reported accruals (Burgstahler et al., 2006). $\ln(\text{Assets})$ is the natural logarithm of total assets and measures firm size. *Leverage* is measured as the long-term financial debt on total assets and controls for variations in financial leverage differentially affecting the firm's earnings management behavior (Watts & Zimmerman, 1986). *Asset growth* is the year-on-year growth in assets, measured as $(\text{Total Assets}_t - \text{Total Assets}_{t-1}) / \text{Total Assets}_{t-1}$. *CFO* is the operating cash flow, measured as $(\Delta \text{Inventory} + \Delta \text{Debtors} + \Delta \text{Other Current Assets}) - (\Delta \text{Creditors} + \Delta \text{Other Current Liabilities}) - \text{Depreciation}$. $\ln(\text{Age})$ is the natural logarithm of the firm's age since foundation (measured in years). To capture potential industry-fixed and year-fixed effects, we include one-digit industry and year-dummies.

5.5. Propensity-score matched sample

To alleviate the concern that group firms and independent firms are dissimilar with respect to a number of features and that these features may be correlated with earnings management activities, we use propensity-score matching models, as developed by Rosenbaum and Rubin (1983), to match independent firms on a broad range of characteristics. We have selected a comprehensive list of attributes that differs between the treatment and control sample and include *Size* (natural logarithm of total assets), *Leverage* (long-term financial debt on total assets), *Growth* (year-on-year growth in assets), *Age* (number of years since foundation date), and *MTR* status (equaling one if the firm's pre-tax result is positive and is larger than the total value of all cumulative loss carry-forwards; zero alternatively) to estimate the selection model of group affiliation.

To balance an optimal variance and bias reduction in this matching procedure, we select the three nearest observations with replacement (Smith, 1997). Because this replacement option allows controls to be matched to more than one treated firm, this 3:1 nearest neighbor matching procedure yields 1396 observations (384 treatment and 1008 control observations). We report descriptive statistics as well as multivariate results based upon the full sample and propensity-score matched sample in the result section below.

Table 2 reports descriptive statistics for all variables, distinguishing between group firms and independent firms (Panel A) and between fully-owned group firms and other group firms (Panel B). Panel A then further divides the statistics for both the full and propensity-score matched sample. For both the full sample and the propensity-score matched sample, group firms have higher absolute discretionary accruals than stand-alone firms (0.104 versus 0.096 for full sample and 0.104 versus 0.098 for propensity score matched sample; $p < 0.05$), consistent with the hypothesis that group firms manage their earnings more. Furthermore, full sample group firms are larger ($p < 0.05$), grow faster ($p < 0.05$), are younger ($p < 0.05$) and are less likely to face a positive *MTR* ($p < 0.01$) compared to stand-alone firms. The substantial differences with respect to these firm characteristics illustrate the need to control for these variables in the multivariate analyses and warrant the use of a propensity-score matched sample as a robustness check.

Furthermore, we learn that the average independent (group) firm has a leverage of 13.77% (10.93%). Also, group (independent) firms are on average about 21 (25) years old. Finally, we learn from the outer right columns of Table 2 that the 3:1 nearest neighbor propensity-score matched sample appears effective in forming a balanced sample of group and independent firms. All accrual control variables are insignificantly different at the 10% level between the two samples.

When we compare fully-owned group firms to other group firms (Panel B), we find that fully-owned group firms in particular have higher *absolute* discretionary accruals (0.123 versus 0.099; $p < 0.01$), consistent with the hypothesis that they manage earnings more. On average, they also have lower unsigned discretionary accruals (0.022 versus 0.045; $p < 0.705$), although median values are very similar in size (0.033 versus 0.035). Fully-owned group firms are similar to non-fully-owned group firms with respect to asset size and financial leverage although they grow slower (0.11 versus 0.19; $p < 0.05$), have lower operating cash flow levels (0.07 versus 0.14; $p < 0.05$), and are older (26 years versus 19 years; $p < 0.01$).

5.6. Correlations

Table 3 presents the Pearson/Spearman pairwise correlations between the dependent and independent variables in our models (full sample). The correlations between the signed variable *DACC* and *CFO* are positive and statistically significant at the 0.01 level. This suggests that discretionary accruals, on average, reduce the offsetting negative association between accruals and *CFO*. Also, *DACC* are significantly positively related to intra-group related receivables (0.167; $p < 0.01$) and *Asset Growth* (0.119; $p < 0.01$). With respect to the unsigned discretionary accruals *Abs(DACC)*, we find a significantly negative pairwise correlation with *Leverage* (-0.206 , $p < 0.01$), firm size (-0.144 , $p < 0.01$) and age (-0.197 , $p < 0.01$). With respect to the independent variables, we find that firm size is positively related to financial *Leverage* (0.332; $p < 0.01$) and to firm age (0.240; $p < 0.01$). The magnitude of these coefficients, however, is relatively moderate, which reduces the concern of multicollinearity in the multivariate tests below. We perform multivariate analyses to test our hypotheses in the following Section.

Table 2

Descriptive statistics.

Panel A: Group firms versus Independent (stand-alone) firms

Variable	Full sample			Propensity-score matched sample			
		N	Mean	Std	N	Mean	Sign.
<i>DACC</i>	Group	384	0.040	0.138	384		
	Indep	5084	0.042	0.127	1008	0.041	
<i>Abs(DACC)</i>	Group	384	0.104	0.099	384		
	Indep	5084	0.096	†	0.093	1008	0.098
<i>Ln(assets)</i>	Group	384	9.77	1.99	384		
	Indep	5084	8.72	†	1.00	1008	9.48
<i>Leverage (%)</i>	Group	384	10.93	16.39	384		
	Indep	5084	13.77	21.93	1008	12.32	
<i>Asset growth</i>	Group	384	0.17	0.36	384		
	Indep	5084	0.10	†	0.26	1008	0.18
<i>CFO</i>	Group	384	0.12	0.20	384		
	Indep	5084	0.13	0.15	1008	0.12	
<i>Age</i>	Group	384	21	19	384		
	Indep	5084	25	†	19	1008	22
<i>MTR</i>	Group	384	0.82	0.39	384		
	Indep	5084	0.90	‡	0.29	1008	0.81

Panel B: Fully-owned group firms versus Other group firms

Variable		N	Mean		Std
<i>DACC</i>	Full_Own	82	0.022	†	0.161
	Other	302	0.045		0.131
<i>Abs(DACC)</i>	Full_Own	82	0.123	‡	0.105
	Other	302	0.099		0.097
<i>Ln(assets)</i>	Full_Own	82	9.30		1.80
	Other	302	9.89		2.02
<i>Leverage (%)</i>	Full_Own	82	8.44		13.50
	Other	302	11.60		17.05
<i>Asset growth</i>	Full_Own	82	0.11	†	0.35
	Other	302	0.19		0.36
<i>CFO</i>	Full_Own	82	0.07	†	0.18
	Other	302	0.14		0.20
<i>Age</i>	Full_Own	82	26	‡	20
	Other	302	19		18
<i>Group_Rec</i>	Full_Own	82	0.142		0.244
	Other	302	0.115		0.177
<i>MTR</i>	Full_Own	82	0.80		0.40
	Other	302	0.82		0.38

Table 3
Correlations.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
[1] <i>DACC</i>	1.000	0.242 (<0.01)	0.040 (<0.01)	0.046 (<0.01)	0.003 0.80	0.763 (<0.01)	0.119 (<0.01)	-0.022 0.10	0.167 (<0.01)
[2] <i>Abs(DACC)</i>	0.454 (<0.01)	1.000	0.002 0.87	-0.144 (<0.01)	-0.206 (<0.01)	0.220 (<0.01)	0.065 (<0.01)	-0.197 (<0.01)	0.169 (<0.01)
[3] <i>MTR</i>	0.054 (<0.01)	0.011 0.42	1.000	0.008 0.57	-0.108 (<0.01)	0.203 (<0.01)	0.069 (<0.01)	-0.018 0.18	0.054 0.29
[4] <i>Ln(assets)</i>	0.022 0.10	-0.160 (<0.01)	0.013 0.35	1.000	0.332 (<0.01)	-0.082 (<0.01)	0.090 (<0.01)	0.222 (<0.01)	-0.057 0.26
[5] <i>Leverage</i>	0.051 (<0.01)	-0.159 (<0.01)	-0.100 (<0.01)	0.181 (<0.01)	1.000	-0.083 (<0.01)	-0.082 (<0.01)	0.240 (<0.01)	-0.002 0.97
[6] <i>CFO</i>	0.766 (<0.01)	0.370 (<0.01)	0.205 (<0.01)	-0.100 (<0.01)	-0.010 0.45	1.000	0.207 (<0.01)	-0.091 (<0.01)	0.089 0.08
[7] <i>Asset_Growth</i>	0.141 (<0.01)	0.044 (<0.01)	0.106 (<0.01)	0.135 (<0.01)	-0.049 (<0.01)	0.240 (<0.01)	1.000	-0.160 (<0.01)	-0.043 0.40
[8] <i>Ln(age)</i>	-0.037 0.01	-0.199 (<0.01)	-0.018 0.18	0.189 (<0.01)	0.153 (<0.01)	-0.110 (<0.01)	-0.094 (<0.01)	1.000 (<0.01)	-0.058 0.25
[9] <i>Group_rec</i>	0.248 (<0.01)	0.188 (<0.01)	-0.006 0.90	0.176 (<0.01)	0.087 0.09	0.098 0.06	0.034 0.50	0.062 0.23	1.000

This table report pairwise correlations between dependent and independent variables where Pearson correlations are reported above and Spearman correlations below the diagonal (N = 5468).

6. Multivariate results

6.1. Unsigned earnings management analyses

We report OLS regression results for unsigned earnings management tests (*Abs(DACC)*) in Table 4. Results for the full sample are reported in the two outer left columns (1) and (2), and results for the propensity-score matched sample are reported in columns (3) and (4). In all regressions, we include control variables as described above. In addition, we include industry

This table reports descriptive statistics for group versus stand-alone firms (Panel A) and for fully-owned versus non-fully-owned group firms (Panel B). In the outer right columns of Panel A, we report means and significance levels for a 1-to-N propensity-score matched sample where we retain the 3 nearest neighbors. With respect to the variable definitions, we define fully-owned as being equal to one when the holding company holds a 100% equity stake in its subsidiary and zero alternatively. *DACC* refers to discretionary accruals and are estimated via the modified Jones (1995) model. More information on the estimation procedure is in Appendix 1. *Abs(DACC)* are the absolute value of the estimated discretionary accruals. *Ln(Assets)* is the natural logarithm of total assets. *Leverage* is measured as long-term financial debt on total assets and is expressed as a percentage. *Asset growth* is the year-on-year growth in subsidiary assets, measured as $(\text{Total Assets}_t - \text{Total Assets}_{t-1}) / \text{Total Assets}_{t-1}$. *CFO* is the operating cash flow figure, measured as $(\text{Net Income} - \text{Total Accruals})$. Total Accruals are calculated as: $(\Delta \text{Inventory} + \Delta \text{Debtors} + \Delta \text{Other Current Assets}) - (\Delta \text{Creditors} + \Delta \text{Other Current Liabilities}) - \text{Depreciation}$. Age is the number of years since the firm's foundation date. *Group_Rec* equals the proportion of year-end intra-group receivables scaled by lagged total assets. *MTR* refers to the Marginal Tax Rate status and is equal to one (1) when a firm pays non-zero taxes on one additional unit of reported income and is equal to zero (0) elsewhere. We proxy for a firm's *MTR* status as suggested in Plesko (2003). We test for differences in means across groups by applying a two-tailed *t*-test; Significance levels are denoted by ‡ ($p < 0.01$), † ($p < 0.05$) and * ($p < 0.10$).

(1-digit) and year fixed effects and test statistics are based on Huber–White standard errors. Note that we include the absolute value of operating cash flows $Abs(CFO)$ in these unsigned accruals regressions to control for absolute magnitude of economic performance (Leuz, Nanda, & Wysocki, 2003).

Regression (1) tests hypothesis H1 that group firms manage reported earnings more than stand-alone firms, by including the Group dummy as an independent variable. Consistent with hypothesis H1, we find that the coefficient of the Group dummy is positive and significant ($\beta_{Group} = 0.014$; $p < 0.05$). Regression (2), which additionally includes the Full_Own dummy, suggests that fully-owned group firms in particular manage earnings significantly more than other group firms: the Full_Own coefficient is positive and significant at the 1% level ($\beta_{Full_Own} = 0.037$; $p < 0.01$). This result confirms hypothesis H2a, which predicts that fully-owned group firms engage more in earnings management than other group firms because of their central role and because earnings management does not affect the value of any minority shareholders. It is inconsistent with the idea that group firms with minority shareholders would engage more in earnings management than fully-owned group firms, in order to cover up the expropriation of private benefits by controlling shareholders at the expense of the minority shareholders (cf. Kim & Yi, 2006). With respect to the control variables, we find that both leverage and age are negatively related to discretionary accruals. Furthermore, $Abs(CFO)$ is highly significant and positively related to $Abs(DACC)$.

Table 4
Unsigned earnings management regressions.

	DEPENDENT = $Abs(DACC)$							
	Full sample				Propensity-scored matched sample			
	(1)		(2)		(3)		(4)	
	Coef.	<i>t</i> -stat	Coef.	<i>t</i> -stat	Coef.	<i>t</i> -stat	Coef.	<i>t</i> -stat
Constant	0.054	3.34 ‡	0.054	3.35 ‡	0.015	0.77	0.018	0.74
Group	0.014	1.86 *	-0.005	-0.87	0.005	1.76 *	-0.003	-0.57
Full_Own			0.037	3.82 ‡			0.036	3.73 ‡
Leverage	-0.016	-2.86 ‡	-0.016	-2.95 ‡	-0.006	-2.54 ‡	-0.005	-2.66 ‡
Ln(assets)	0.000	0.40	0.001	0.65	0.001	0.81	0.002	1.03
Asset growth	-0.007	-1.24	-0.006	-1.20	0.013	2.11 †	0.014	1.63 *
Abs(CFO)	0.443	36.31 ‡	0.444	36.55 ‡	0.448	28.51 ‡	0.441	18.99 ‡
Ln(Age)	-0.008	-5.68 ‡	-0.008	-5.93 ‡	-0.003	-1.47	-0.004	-1.92 †
Industry dummies	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
<i>N</i>	5468		5468		1396		1396	
Adj.R2	0.401		0.403		0.437		0.450	

This table presents coefficients and Huber–White corrected *t*-statistics of OLS regressions in which we regress absolute values of discretionary accruals ($DACC$) on a group dummy ($Group$); a group dummy for subsidiaries that are 100% owned ($Full_Own$); a firm's marginal tax rate (MTR) status; and a bunch of control variables identified in the literature. All variables are measured as described in the text, Sections 5.1 to 5.4. Discretionary accruals are calculated as in the modified Jones (1995) model and details over the estimation procedure are reported in Appendix 1. Results in the outer two left columns contain results for the full sample of treatment and control firms. Results in the outer right columns are for the 3:1 propensity-score matched sample (with replacement). Significance levels are denoted by ‡ ($p < 0.01$), † ($p < 0.05$) and * ($p < 0.10$).

We repeat the analyses for the propensity-score matched sample in columns (3) and (4) and obtain qualitatively very similar results. While the sample size reduces substantially ($N = 1396$), and the association between $Abs(DACC)$ and firm age becomes less significant, we still observe that group firms manage earnings more than independent firms on average, and that fully-owned group firms engage more in earnings management than group firms with minority interests.

6.2. Directional earnings management analyses

In our next set of analyses, we test for the association between directional earnings management (i.e., the signed value for discretionary accruals ($DACC$)) and our variables of interest. These directional tests allow for a direct test on the importance of tax-avoiding earnings management behavior in group firms. We also include a battery of control variables. Moreover, we include industry (1-digit) and year fixed effects, and test statistics are based on Huber–White standard errors. In the signed earnings management regressions, we control for the signed CFO to capture potential noise in the earnings management proxy that is correlated with the underlying cash-flow variable.

In the first reported regression (5), we include the MTR tax status next to the group dummy. In regression (6) we additionally include an interaction term between the group dummy and the MTR dummy to test for differences in tax minimizing earnings management between group firms and stand-alone firms (H3). First, the results of regression (5) suggest that, on average, Belgian firms manage their earnings to minimize taxes: the MTR dummy coefficient is negative and significant ($\beta_{MTR} = -0.053$; $p < 0.01$), which is consistent with the argument that firms with a positive MTR manage earnings more downward, compared to firms with a zero MTR . This evidence is consistent with the arguments in Coppens and Peek (2005) and Vanstraelen and Van Tendeloo (2008). In regression (6), the interaction term $Group \times MTR$ captures the incremental tax-avoiding earnings management for positive MTR group firms. Results show that group firms manage earnings significantly more downward as opposed to independent firms when faced with a positive MTR (-0.026 ; $p < 0.05$). This evidence is consistent with our lines of thought and hypothesis H3. Finally, in Regression (7) we include two more interaction terms: $Group \times Leverage$ and $Group \times CFO$. While the leverage interaction controls for accruals potentially being differently related to financial leverage levels across group and independent firms, the CFO interaction does the same but for differences in operational profitability.²¹ We find that none of these interaction effects become significant and, potentially more importantly, that the incremental tax effect for group firms persists.

In addition, we find through all regression specifications that discretionary accruals are positively related to a firm's leverage. This is consistent with the debt contracting cost argument (DeFond & Jiambalvo, 1994; Watts & Zimmerman, 1986). Finally, we also find that discretionary accruals are negatively related to *Asset Growth* and positively related to financial leverage, operational cash flows, and firm size.

Repeating our analyses for the propensity-score matched sample again (regressions 8 to 10) confirms the results for the full sample. The directional earnings management tests indicate that positive MTR firms manage earnings downward for tax reasons and that group

²¹ We thank an anonymous referee for this suggestion.

firms manage earnings even more downward as opposed to independent firms. In addition, the group dummy, which captures directional earnings management for zero *MTR* group firms, becomes marginally significant and positive. This evidence suggests that group firms with zero *MTR* tax status manage their earnings upward and are consistent with the idea that the offsetting of losses and profits in business groups is managed strategically. With respect to the control variables, we observe similar associations albeit with less significant coefficients for leverage and *Asset Growth* in regressions (8) to (10).

6.3. Additional analyses

6.3.1. Intra-group receivables and earnings management

One claim underlying our hypotheses as well as those of Kim and Yi (2006) is that group firms have more opportunities and means available to manage earnings compared to stand-alone firms. This reasoning seems warranted, particularly because prior research has illustrated the existence of related party transactions in concert with earnings management (Gordon & Henry, 2005) and financial fraud (Henry, Gordon, Reed, & Louwers, 2007). However, discretionary earnings management tests do not measure this association directly.

Our dataset has the unique characteristic that we observe the level of intra-group activity through the importance of intra-group receivables compared to total receivables. Group receivables are the fiscal year-end outstanding intra-group sales net of intercompany lending components. Thus, these accounts represent purely operational intra-group accounts receivables and are unrelated to firm leverage. If earnings management indeed is facilitated through intra-group transactions, we expect that the magnitude of earnings management is associated with the importance of intra-group receivables in each affiliate. We therefore test for this association in Table 6 (Regression 11) and additionally examine whether this pattern is more pronounced for fully-owned subsidiaries as opposed to non-fully-owned affiliates (Regression 12). (See Table 5.)

Results for group firms in isolation ($N = 384$) are reported in Table 6. In Regression (11) the coefficient on *Group_Rec* is positive and significant ($\beta_{Group_Rec} = +0.070$; $p < 0.01$), confirming that, in particular, group firms with higher outstanding fractions of intra-group receivables engage more in earnings management. When both *Group_Rec*, the *Full_Own* dummy and their interaction are included in Regression (12), both variables have a significant and positive effect on the level of earnings management as measured by *Abs(DACC)*. The interaction coefficient between *Group_Rec* and *Full_Own*, however, is insignificant and suggests that the effect of *Group_Rec* is not especially higher in fully-owned group firms compared to other group firms. This additional test provides further comforting evidence that group-affiliation, and more specifically the intensity by which transactions are orchestrated across group members, serves the purpose for group firms to manage earnings in a particular direction.

6.3.2. Robustness tests

We performed additional analyses to corroborate our general findings. The first robustness check relates to introducing holding-specific controls. As none of the individual firms in our sample is listed on a stock exchange, one could argue that capital market incentives will not affect earnings management of these firms. However, all the group firms in our sample are

Table 5

Directional earnings management regressions.

	DEPENDENT = <i>DACC</i>											
	Full sample						Propensity-score matched sample					
	(5)		(6)		(7)		(8)		(9)		(10)	
	Coef.	<i>t</i> -stat	Coef.	<i>t</i> -stat	Coef.	<i>t</i> -stat	Coef.	<i>t</i> -stat	Coef.	<i>t</i> -stat	Coef.	<i>t</i> -stat
Constant	-0.110	-5.55 ‡	-0.111	-5.60 ‡	-0.109	-5.50 ‡	-0.123	-5.78 ‡	-0.136	-6.05 ‡	-0.135	-3.95 ‡
Group	-0.011	-2.07 †	0.010	0.94	0.012	1.06	-0.008	-1.46	0.020	1.69 *	0.025	1.82 *
<i>MTR</i>	-0.053	-14.08 ‡	-0.050	-12.75 ‡	-0.051	-12.94 ‡	-0.049	-7.81 ‡	-0.038	-5.16 ‡	-0.042	-5.84 ‡
<i>Group</i> × <i>MTR</i>			-0.026	-2.15 †	-0.026	-2.13 †			-0.035	-2.63 ‡	-0.022	-2.61 ‡
<i>Leverage</i>	0.023	3.89 ‡	0.022	3.79 ‡	0.023	3.75 ‡	0.020	1.73 *	0.019	1.65 *	0.021	1.85 *
<i>Group</i> × <i>Leverage</i>					-0.004	-0.15					0.001	0.01
<i>Ln</i> (assets)	0.013	9.68 ‡	0.013	9.67 ‡	0.013	9.48 ‡	0.013	8.46 ‡	0.013	8.55 ‡	0.013	6.22 ‡
<i>Asset growth</i>	-0.023	-4.07 ‡	-0.023	-4.11 ‡	-0.023	-4.23 ‡	-0.013	-1.82 *	-0.013	-1.95 *	-0.016	-1.82 *
<i>CFO</i>	0.660	50.35 ‡	0.661	50.53 ‡	0.671	48.26 ‡	0.645	46.67 ‡	0.647	46.83 ‡	0.694	46.42 ‡
<i>Group</i> × <i>CFO</i>					-0.09	-2.70 ‡					-0.124	-2.86 ‡
<i>Ln</i> (Age)	0.002	1.15	0.002	1.22	0.002	1.20	-0.001	-0.20	-0.001	-0.13	-0.001	-0.12
Industry dummies	Yes		Yes		Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes		Yes		Yes	
<i>N</i>	5468		5468		5468		1396		1396		1396	
Adj.R2	0.617		0.618		0.619		0.627		0.629		0.639	

This table presents coefficients and Huber–White corrected *t*-statistics of OLS regressions in which we regress signed values of discretionary accruals (*DACC*) on a group dummy (*Group*); a firm's marginal tax rate (*MTR*) status; plus interaction effects between aforementioned variables and control variables. All control variables are measured as described above. Discretionary accruals are calculated as in the modified Jones (1995) model and details over the estimation procedure are reported in Appendix 1. Results (5) to (7) contain results for the full sample of treatment and control firms. Results (8) to (10) are for the 3:1 propensity-score matched sample (with replacement). Significance levels are denoted by ‡ ($p < 0.01$), † ($p < 0.05$) and * ($p < 0.10$).

controlled by a listed holding company. Capital market incentives may therefore have an indirect yet important effect on the earnings management by group firms, as they may provide an incentive to manage the consolidated earnings reported by the holding company. In order to investigate whether characteristics of the controlling holding company affect earnings management by group members, we included measures of profitability, size, and leverage of the controlling holding company in the regressions reported in the paper, but none of these variables turned out to have a significant effect. Also, the interpretation and significance of our main variables of interest remain unaffected.

Second, we repeated all analyses while controlling for alternative regression techniques like fixed-effect panel data specifications and clustering standard errors in a one-way, respectively two-way manner. Results remain qualitatively similar across all models and specifications. Finally, we reran analyses for discretionary accruals calculated on short-term working capital accruals accounts only and again all inferences remain unchanged.

7. Conclusions

While there is an extensive literature on business groups features, very few studies have explicitly focused on earnings management in business groups. In the current study, we are among the first examining firm-level discretionary accruals management activities in non-financial business groups and test at the same time for the predominance of tax incentives versus minority interest expropriation as a key driver for the observed earnings management. For a sample of Belgian business groups (holdings), we find that group firms manage their

Table 6
Affiliate firms' earnings management and intra-group transactions.

	<i>Abs(DACC)</i>			<i>Abs(DACC)</i>		
	(11)			(12)		
	Coef.	<i>t</i> -stat		Coef.	<i>t</i> -stat	
Constant	0.006	0.16		0.001	0.03	
<i>Group_Rec</i>	0.070	3.46	‡	0.079	3.01	‡
<i>Full_Own</i>				0.035	3.04	‡
<i>Full_Own</i> × <i>Group_Rec</i>				−0.038	−0.93	
<i>Leverage</i>	−0.045	2.37	†	−0.043	2.32	†
<i>Ln(assets)</i>	0.000	−0.20		0.001	0.39	
<i>Asset_Growth</i>	0.013	0.92		0.014	1.04	
<i>Abs(CFO)</i>	0.395	10.15	‡	0.401	10.38	‡
<i>Ln(age)</i>	0.012	1.92	*	0.008	1.32	
Industry fixed effects	YES			YES		
Year fixed effects	YES			YES		
<i>N</i>	384			384		
Adj.R2	0.427			0.441		

This table presents coefficients and Huber–White corrected *t*-statistics of OLS regressions of unsigned discretionary accruals *ABS(DACC)* on intra-group receivables importance; a full-ownership group dummy; the interaction between intra-group receivables importance and full-ownership dummy; and control variables at the subsidiary level. Discretionary accruals are calculated as in the modified Jones (1995) model and details over the estimation procedure are described in Appendix 1. All other variables are as described above.

earnings more than stand-alone firms. This is consistent with the idea that group firms have more tools and opportunities to manage earnings compared to stand-alone firms.

Furthermore, we find that fully-owned group firms in particular manage their earnings more, which is consistent with the hypothesis that controlling shareholders face fewer constraints to manage earnings of a fully-owned subsidiary because opportunistic earnings management actions cannot adversely affect the value of any minority shareholders. The positive effect of full ownership on earnings management is, however, inconsistent with the idea that group firms would engage in earnings management to hide self-serving transactions (wealth expropriation) made by the controlling shareholders. On the incentive part, we find that group firms strategically manage earnings in response to tax incentives. More specifically, discretionary accruals of group firms depend significantly more on the marginal tax rate status of the firm as compared to independent firms. To the best of our knowledge, this study is also one of the first documenting the importance of intra-group accruals contributing to earnings management within business groups. As such, it provides direct evidence for other studies arguing that complex business structures have unique features to obfuscate financial reporting quality (Kim & Yi, 2006; Rego, 2003).

The current findings have important implications for several economic stakeholders. They are important for standard setters, tax inspectors, and national governments because we show that business groups manage earnings more than independent firms and that group firms especially exploit opaque network transactions to manage earnings. Our results also suggest that even in the absence of fiscal consolidation, business groups use their group structures for earnings management to minimize the total tax bill. As a consequence, an important contribution of this study is that the individually reported financial statements of group firms located in a country with close book-tax conformity are inherently tax-biased, leading to a distortion toward external users such as banks, creditors, and suppliers. We acknowledge that while our study sheds new light on the strategic reporting decisions of business groups, a limitation of our approach is that we can only observe reporting decisions in domestic (in our case, Belgian) subsidiaries. Similar to Gramlich et al. (2004) and Kim and Yi (2006), we therefore cannot incorporate the effect of having access to other (foreign) tax jurisdictions. Moreover, the use of a one-country study limits the generalization of our results to other institutional settings. We therefore see an investigation of earnings management decisions within multinational business groups as a fruitful avenue for further research.

Appendix 1. A note on discretionary accruals estimation procedure

To quantify the discretionary component of a firm's total accruals, we performed discretionary accruals estimations in which we segregated total accruals into discretionary and non-discretionary accruals through the estimation of yearly cross-sectional sector peer regressions. The total extent of earnings management (discretionary accruals) in our sample and control firm is estimated by running multiple cross-sectional 2-digit sector peer regressions as in Dechow et al. (1995).

$$TotAcc_{it} = \alpha_0 + \beta(\Delta Sales - \Delta REC)_{it} + \gamma(PPE)_{it} + \varepsilon_{it}. \quad (A1)$$

Where $\text{TotAcc} = \text{total accruals, measured by the balance sheet approach as } (\Delta\text{inventory} + \Delta\text{debtors} + \Delta\text{other current assets}) - (\Delta\text{creditors} + \Delta\text{other current liabilities}) - \text{depreciation}$, ΔSales is the year-on-year change in sales, ΔRec is the year-on-year change in accounts receivable and PPE is the firm-level of property, plant and equipment. We compute a firm's discretionary accruals by running these estimation models on 2-digit sector peers for all years separately, being 1998–2001.

With respect to the yearly cross-sectional accruals regression we can report the following information. There are sixty (60) 2-digit sector (NACE) codes ranging from 01 (agriculture) to 99 (extra-territorial organizations). The exclusion of all financial institutions and utility sectors (respectively sector 65–67 and sector 40–41) limits this number to 55. Out of these 55 sector classifications, holding and stand-alone firms are represented in 42 two-digit sectors, resulting in 168 (i.e., 42 times 4) sector-year regression coefficients. The mean (median) number of available sector peers used in the regressions is 473 (299) and varies between a minimum of 33 (NACE 18: Leather Products, in 1998) and 2887 (NACE 51: Retail — General Products, in 2000).

References

- Banerjee, S., Leleux, B., & Vermaelen, T. (1997). Large shareholdings and corporate control: An analysis of stake purchases by French holding companies. *European Financial Management*, 3(1), 23–44.
- Becht, M., Chapelle, A., & Renneboog, L. (2001). Shareholding cascades: The separation of ownership and control in Belgium. In F. Barca, & M. Becht (Eds.), *The control of corporate Europe* (pp. 71–105). Oxford: Oxford University Press.
- Bertrand, M., Mehta, P., & Mullainathan, S. (2002). Ferreting out tunneling: An application to Indian business groups. *Quarterly Journal of Economics*, 117, 121–148.
- Burgstahler, D., Hail, L., & Leuz, C. (2006, October). The importance of reporting incentives: Earnings management in European private and public firms. *The Accounting Review*, 81(5), 983–1016.
- Buysschaert, A., Deloof, M., & Jegers, M. (2004). Equity sales in Belgian corporate groups: Expropriation of minority shareholders? A clinical study. *Journal of Corporate Finance*, 10, 81–103.
- Buysschaert, A., Deloof, M., Jegers, M., & Rommens, A. (2008). Is group affiliation profitable in developed countries? Belgian evidence. *Corporate Governance: An International Review*, 16, 504–518.
- Chang, S., & Hong, J. (2000). Economic performance of group-affiliated companies in Korea: Intragroup resource sharing and internal business transactions. *Academy of Management Journal*, 43(3), 429–448.
- Claessens, S., Fan, J., & Lang, L. (2006). The benefits and costs of group affiliation: Evidence from East Asia. *Emerging Markets Review*, 7, 1–26.
- Collins, J., Kemsley, D., & Lang, M. (1998). Cross-jurisdictional income shifting and earnings valuation. *Journal of Accounting Research*, 36(2), 209–229.
- Coppens, L., & Peek, E. (2005). An analysis of earnings management in private European firms. *Journal of International Accounting, Auditing and Taxation*, 14(1), 1–17.
- Daems, H. (1978). *The holding company and corporate control*. Nijmegen: Martinus Nijhoff.
- Dechow, P. M., Richardson, S. A., & Tuna, I. (2003). Why are earnings kinky? An examination of the earnings management explanation. *Review of Accounting Studies*, 8(2–3), 355–384.
- Dechow, P., Sloan, R., & Sweeney, A. (1995). Detecting earnings management. *The Accounting Review*, 70(2), 193–225.
- DeFond, M., & Jambalvo, J. (1994). Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics*, 17, 145–176.
- Eilifsen, A., Knivsfla, A., & Soettem, F. (1999). Earnings manipulation: Cost of capital versus tax. *European Accounting Review*, 8(3), 481–491.
- Faccio, M., & Lang, L. (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics*, 65, 365–395.

- Ferris, S., Kim, K., & Kitsabunnarat, P. (2003). The costs (and benefits) of diversified business groups: The case of Korean chaebols. *Journal of Banking and Finance*, 27, 251–273.
- Fields, V., Lys, T., & Vincent, L. (2001). Empirical research on accounting choice. *Journal of Accounting and Economics*, 31, 255–307.
- Gopalan, R., Nanda, V., & Seru, A. (2007). Affiliated firms and financial support: Evidence from Indian business groups. *Journal of Financial Economics*, 86(3), 759–795.
- Gordon, E., & Henry, E. (2005). Related party transactions and earnings management. *Working Paper*. : Rutgers University.
- Graham, J. (1996). Proxies for the marginal tax rate. *Journal of Financial Economics*, 42, 187–221.
- Gramlich, J., Limpaphayom, P., & Ghon Rhee, S. (2004). Taxes, keiretsu affiliation, and income shifting. *Journal of Accounting and Economics*, 37(2), 203–228.
- Guenther, D. (1994). Earnings management in response to corporate tax rate changes: Evidence from the 1986 Tax Reform Act. *The Accounting Review*, 69(1), 230–243.
- Healy, P., & Wahlen, J. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, 13(4), 365–383.
- Henry, E., Gordon, E., Reed, B., & Louwers, T. (2007). The role of related party transactions in fraudulent financial reporting. *Working Paper*.
- Jacob, J. (1996). Taxes and transfer pricing: income shifting and the volume of intrafirm transfers. *Journal of Accounting Research*, 34(2), 301–312.
- Jian, M., & Wong, T. J. (2010). Propping through related party transactions. *Review of Accounting Studies*, 15(1), 70–105.
- Johnson, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2000). Tunneling. *The American Economic Review*, 90, 22–27.
- Jones, J. (1991). Earnings management during import relief investigations. *Journal of Accounting Research*, 29(2), 193–228.
- Jung, K., Kim, B., & Kim, B. (2009). Tax motivated income shifting and Korean business groups. *Journal of Business Finance & Accounting*, 36(5–6), 552–586.
- Kim, J. -B., & Yi, C. (2006). Ownership structure, business group affiliation, listing status, and earnings management: Evidence from Korea. *Contemporary Accounting Research*, 23(2), 427–464.
- Klassen, K., Pittman, J., & Reed, M. (2004). A cross-national comparison of R&D expenditure decisions: Tax incentives and financial constraints. *Contemporary Accounting Research*, 21(3), 639–680.
- Lanis, R., & Richardson, G. (2012). Corporate social responsibility and tax aggressiveness: An empirical analysis. *Journal of Accounting and Public Policy*, 31, 86–108.
- Leuz, C., Nanda, D., & Wysocki, P. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics*, 69, 505–527.
- Lin, B., Rui, L., & Zhang, T. (2012). Tax-Induced Earnings Management in Emerging Markets: Evidence from China. *The Journal of the American Taxation Association*, 34(2), 19–44.
- Mills, L., Erickson, M., & Maydew, E. (1998). Investments and tax planning. *Journal of American Taxation Association*, 20(1), 1–20.
- Mills, L., & Newberry, K. (2004). Do foreign multinationals' tax incentives influence their US income and reporting debt policy? *National Tax Journal*, 57(1), 89–107.
- Nelson, M., Elliott, J., & Tarpley, R. (2003). How are earnings managed? Examples from auditors. *Accounting Horizons*, 17, 17–35 (Supplement).
- OECD (2004). *Recent tax policy trends and reforms in OECD countries*.
- Plesko, G. A. (2003). An evaluation of alternative measures of corporate tax rates. *Journal of Accounting and Economics*, 35, 201–226.
- Rego, S. (2003). Tax-avoidance activities of U.S. multination corporations. *Contemporary Accounting Research*, 20(4), 805–833.
- Rosenbaum, P., & Rubin, D. (1983). The central role of propensity score in observational studies for causal effects. *Biometrika*, 70(1), 41–55.
- Roubi, R., & Richardson, W. (1998). Managing discretionary accruals in response to reductions in corporate tax rates in Canada, Malaysia and Singapore. *The International Journal of Accounting*, 33(4), 455–467.
- Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics*, 42(3), 335–370.

- Scholes, M., Wilson, M., & Wolfson, M. (1992). Firms' responses to anticipated reductions in tax rates: The Tax Reform Act of 1986. *Journal of Accounting Research*, 30(Supplement 1992), 161–185.
- Scholes, M., Wolfson, M., Erickson, M., Maydew, E., & Shevlin, T. (2002). *Taxes and business strategy: A planning approach* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.
- Shin, H. H., & Stulz, R. M. (1998). Are internal capital markets efficient? *Quarterly Journal of Economics*, 113, 531–552.
- Smith, H. (1997). Matching with multiple controls to estimate treatment effects in observational studies. *Sociological Methodology*, 27, 325–353.
- Vander Bauwhede, H., Willekens, M., & Gaeremynck, A. (2003). Audit firm size, public ownership, and firm's discretionary accruals management. *The International Journal of Accounting*, 38, 1–22.
- Vanstraelen, A., & Van Tendeloo, B. (2008). Earnings management and audit quality in Europe: Evidence from the private client segment market. *European Accounting Review*, 17(3), 447–469.
- Verschueren, I., & Deloof, M. (2006). How does intragroup financing affect leverage: Belgian evidence. *Journal of Accounting, Auditing and Finance*, 21(1), 83–108.
- Watts, R., & Zimmerman, J. (1986). *Positive accounting theory*. Upper Saddle River, NJ 07458: Prentice Hall.