

Business Groups, Taxes and Accruals Management [★]

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Abstract

This paper provides evidence that Belgian firms belonging to a business group have a lower effective tax rate (ETR) and face a less positive association between pre-tax income and ETRs than independent firms. These findings suggest that individual group members apply efficient tax planning techniques in order to minimize taxes at the group level. We hypothesize that group firms strategically adjust firm-level reported earnings levels in response to tax incentives. We find evidence consistent with this hypothesis, in that the intrinsic negative association between total accruals and operating cash flows is more (*less*) pronounced for group firms facing a positive (*zero*) marginal tax rate status, compared to independent firms. In addition, we find that a group firm's net tax-paying situation is more important in its discretionary accruals reporting decisions, compared to independent firms. Finally, we identify intra-group receivables as relevant tax-reducing accruals components. Results are robust to alternative model specifications, variable definitions and measures.

JEL classification: G32, H21, M41

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1. Introduction

In this paper, we examine the effect of business group affiliations on tax-motivated earnings management and income shifting for a sample of Belgian firms. Although there is a large literature on corporate governance issues and costs or benefits associated with business group affiliations, there is hardly any evidence on firm-level earnings management and intra-group income shifting behavior for tax reasons within business groups. This is, however, an important issue since group-affiliated firms can rely on internal capital markets to finance their activities, making them less dependent on debt contracts with external financiers (see e.g. Claessens et al. (2005)). Consequently, group firms are substantially more likely than independent firms to manage earnings for reasons other than financial contracting. Moreover, business groups operate through complicated networks, providing group-affiliated firms with substantial discretionary tools and flexibility to manage earnings (Kim and Ji (2006)).

Kim and Ji (2006) document higher accruals management levels for a sample of Korean chaebol firms compared to non-affiliated firms and explain these findings from the bad corporate governance systems in-place in Korean business groups. They argue that group-affiliated firms have more opportunities and means than unaffiliated firms to divert firm resources at the expense of minority shareholders, and therefore predict and find more opportunistic earnings management to mask true performance. Kim and Ji (2006), however, do not consider tax motivations as a potential determinant of their findings.

Recent empirical evidence also suggests that related business entities operating within the same jurisdiction capitalize on their group affiliations by shifting income between group members, hereby minimizing their group-level tax burden (e.g. Gramlich et al. (2004), Scholes et al. (2002)). Income shifting between group members can indeed result in tax minimization because generally, tax codes treat gains and losses asymmetrically: a firm has to pay taxes if it makes a profit, but the government does not pay the firm if it makes a loss. The tax code's carry-forward (backward) provisions reduce this disadvantage but, however, do not eliminate it. Hence, two or more affiliated firms with a differential tax status can minimize their overall tax load by shifting income from profitable entities to loss-making entities (Scholes et al. (2002)).

In this paper, we combine both aspects and study to what extent accruals management in business groups is in line with tax-minimizing reporting behavior *and* whether intra-group accruals shifts contribute to this behavior. Our analysis is based on firm-level data of Belgian business group member firms, affiliated to a listed holding company (i.e. *holding* group) over

a five-year period 1997-2002. The motivations for using these data are fourfold. First, business groups controlled by holding companies historically have played an important role in the Belgian (as well as the Continental European) economy and still represent a large fraction of the entire economic activity (e.g. Becht et al. (2001)). Second, Belgian law prescribes both publicly listed as well as unlisted firms to report individual financial statements. This creates the opportunity to examine accruals management and shifting at the firm-level, irrespective of a firm's listing status. Third, whereas consolidated group taxation is practiced in many countries worldwide – including the US – this is not the case in Belgium where firms are taxed individually.¹ This specific tax code characteristic enables us to study firm-level accruals management and income shifting for tax reasons instead of being tied to consolidated data. Fourth, tax incentives are very emphatic in Belgium, because of the close link that exists between financial reporting and tax reporting (e.g. Coppens and Peek (2005), Vander Bauwhede et al. (2003)). The combination of these institutional and firm-specific characteristics provides a unique setting for examining the inclination of group firms to manage firm-level earnings and to shift intra-group accruals for tax reasons.

Our empirical results confirm the hypothesis that, controlling for various firm characteristics, group-affiliated firms have a lower effective tax rate (ETR) than non-affiliated firms. Moreover, the findings are consistent with the argument of efficient tax planning within business groups as affiliated firms face a significantly less positive association between the ETR and pre-tax profitability than non-affiliated firms. Further, results show that group firms facing a positive marginal tax rate (MTR) – i.e. pay additional taxes when earning one additional currency unit of income – smooth pre-tax earnings significantly more than independent firms with a positive MTR. Tax-exempt group firms, by contrast, exhibit a significantly less negative association between operating cash flow and total accruals compared to tax-exempt independent firms. This is consistent with the hypothesis that group firms manage accruals at the firm-level, in an attempt to lower the overall tax burden at the group level.

¹ 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.

² There are, however, some exceptions of studies that are related, but not identical to our study. Beatty and Harris (1999) consider tax motivations in financial reporting behavior of public and private firms (1999) and at the individual group member level (2001). However, one key difference with our study is that Beatty and Harris (1999; 2001) examine firm-level data of bank holding companies whereas we study non-financial, industry-diversified group firms. In a recent working paper, Kim and Ji (2005) analyze earnings management behavior in Korean (chaebol) group members. The focus of their analysis, however, is on the wedge between ownership and control in relation to earnings management and the authors do not address issues like tax evasion in their study context.

Finally, we examine a directly observable intra-group accruals component, namely intra-group receivables, as a potential tool for this tax-induced earnings management. Results indicate that group firms adjust intra-group receivables optimally to smooth pre-tax profits, but only when group firms have high levels of intra-group receivables. This is consistent with the hypothesis that specific intra-group connectivity facilitates group members in adjusting their reported earnings figure. The overall evidence persists after sensitivity checks for alternative model specifications, different earnings management measures and various cut-off levels on intra-group receivables.

The combined findings support our hypothesis that tax motivations are important drivers of the financial reporting behavior in Belgian group firms. We find that group firms have a higher prevalence to manage earnings for tax reasons than independent firms and, in addition, we are able to identify intra-group transactions as tax-motivated income shifting mechanisms between affiliated group firms. To our knowledge, the current study is the first to examine firm-level *and* intra-group earnings management activities in response to tax incentives in non-financial business groups. This study is an important contribution to the developing domain of financial reporting behavior within business groups (Gramlich et al. (2004) and Kim and Ji (2006)).

The remainder of our paper is as follows. Section 2 discusses Belgian business groups and the main features of the Belgian tax code. In Section 3, we provide an overview of related literature and formulate our hypotheses. Section 4 describes the sample and variables, next to the empirical model for testing the accruals-cash flow association, conditioning for tax-avoidance behavior. Section 5 presents the empirical results. Finally, Section 6 summarizes and concludes the study.

2. Belgian Business Groups and Belgian Tax code

Belgian 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, 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 and Lang (2002)). These holding companies can be defined as “professionally managed institutions owning 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)).³

The importance of Belgian business groups, based on holding company structures, should be seen in its historical context. As 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)).⁴ 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. Out of all Belgian firms listed in the mid 1990s, about 40 per cent were industry-diversified holdings and their capital market capitalization represented about 25 per cent of the entire Belgian stock market (Becht et al. (2001)).

Because of the omnipresence and importance of business groups both in developed as in developing countries, several potential rationales have been put forward for their existence. First, typical agency problems may be reduced in business groups through a better alignment of risk bearing and control (Claessens et al. (2005)). Further, bankruptcy costs may be lower through facilitating renegotiations with creditors in distress situations (e.g. 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 et al. (2003)). Further, holdings could improve overall managerial efficiency since professional advice and expertise is facilitated through related business parties. A potential rationale for business groups from an investor point of view is portfolio diversification: a holding company enables investing in a network of industry-diversified firms while holding only one or very few investments (Deloof (1998)). Further, the existence of internal capital markets is another important justification for

³ 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 since the aforementioned business groups refer to organizational forms which “*actively monitor and control a network of industrial and financial firm entities*” (Banerjee et al. (1997)).

⁴ 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 which 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. Further, it is common practice that holdings strictly supervise the operations, finance and business strategies of group members (e.g. Deloof (1998)).

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 (e.g. Claessens et al. (2005)).

A final impulse 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 (like in Belgium is the case), business groups can reduce overall tax payments by carefully allocating profits and losses across tax-exempt and taxable group members. In this paper, we investigate the effect of group affiliation on corporate income tax, and relate this effect to firm-level accruals management and intra-group accruals shifting. Before we elaborate on these issues, we first summarize some essential characteristics of the Belgian tax code.

The Belgian Tax code

During our observation period 1997-2002, Belgian firms reporting a positive pre-tax income are taxed at a statutory tax rate 40.17 per cent. This percentage contains 39 per cent basic statutory corporate tax on taxable income, plus a 3 per cent times 39 per cent = 1.17 per cent supplementary tax (i.e. a crisis surcharge, introduced by the Belgian government in 1993 for macro-economic budgetary reasons).⁵ Effective taxes paid to the fiscal authorities can differ from this statutory rate because Belgian firms are allowed to carry losses forward, amongst other. Carry-backward of losses is, however, not allowed in Belgium.⁶

The Belgian Royal Decree on consolidated financial statements is based on the 7th European Directive Scheme, providing detailed guidelines on which firms should be included or excluded from the consolidation, or be partially consolidated. Further, Belgian tax authorities do not levy taxes at this consolidated business group level but rather at the individual firm level (OECD (2004)). Belgian business groups therefore do not automatically benefit from the levelling out of positive and negative income numbers from group members in their average tax bill. This characteristic makes the Belgian setting particularly interesting to study tax-induced financial reporting within business groups.

⁵ Note that firms with a pre-tax income not exceeding EUR 322,262 are subject to a reduced and gradually imposed statutory tax rate of 28 per cent on a pre-tax profit between EUR 0 and EUR 24,789; 36 per cent on the pre-tax profit between EUR 24,790 and EUR 89,242 and 41 per cent on the pre-tax profit between BEF 89,243 and EUR 322,262.

⁶ Although carry backward of losses is common practice in the US and the UK, most Continental European countries do not allow firms to carry losses backward. Exceptions are France (3 years, with certain limitations) and Germany (2 years). Unlimited carry forward of losses in Europe, next to Belgium, is allowed in Germany, Ireland, Luxembourg, The Netherlands, Sweden and the UK (OECD, 2004).

3. Taxes and Earnings Management in Business Groups

3.1 Taxes and business groups

Corporate taxes and firm behavior in response to taxes are typically studied in the framework of Scholes et al. (2002), where tax planning is an outcome of multiple business considerations and perspectives. In the absence of financial contracting motivations, firms may aim at tax minimization since this optimizes the available resources for the firm itself, and it minimizes capital outflow to the government in the form of explicit taxes. Prior studies on tax avoidance in multinationals 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 et al. (1998), Jacob (1996), Mills and Newberry (2004), Rego (2003)). These studies look at cross-jurisdictional tax-avoidance activities of US multinational corporations and typically conclude that multinationals allocate revenues to low-tax countries, and expenses to high-tax countries, to reduce average tax burdens.

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). Collins et al. (1998) argue that the analysis of tax-motivated income shifts between related firms in one jurisdiction even provides a stronger setting since this creates permanent tax avoidance, whereas cross-jurisdictional income shifting often only results in temporary tax savings.⁷ Nevertheless, empirical studies focusing on income shifting within one jurisdiction are relatively rare.

Yetman (2001) studies tax-motivated expense allocations by US nonprofit organizations and shows that both medical and educational nonprofit organizations allocate expenses from their tax-exempt to their taxable activity centers and hereby reduce their overall tax liability.⁸ Beatty and Harris (2001) document that the realization of security gains and losses in banks owned by large US bank holding companies is related to tax and financial statement objectives of both the individual bank and the consolidated group. Gramlich et al. (2004) find that Japanese keiretsu firms face lower effective taxes than independent firms and that this tax

⁷ US multinational firms, e.g., can permanently reduce average tax loads by shifting foreign income to US entities if the statutory tax rate abroad is higher than in the US. Conversely, US firms only defer taxes if they shift income from US located business entities to lower-tax foreign tax jurisdictions because of the existence of nonbinding foreign tax credit limitations (Collins et al. (1998)). Hence, depending on the statutory tax rate differences across jurisdictions in tax savings are either permanent or temporary.

⁸ Although nonprofit organizations are generally exempt from income taxation, they pay taxes on profits from activities that are unrelated to their primary purpose. This tax on unrelated businesses was introduced primarily to prevent unfair competition with for-profit businesses (Yetman, 2001).

reduction likely is a result of intra-group income shifts.⁹ These studies suggest that the findings for multinational tax-minimizing income shifting behaviour also apply to related business entities operating within the same jurisdiction.

Business groups have interesting features to study corporate tax-avoidance behavior for two reasons. First, financial contracts with creditors, lenders, customers, suppliers and other stakeholders often use accounting numbers to specify the terms of trade, and hereby lower the individual firm's willingness to report lower income for tax purposes (Shackelford and Shevlin (2001)). However, group membership makes firms less reliant on external capital providers because of the existence of internal capital markets (e.g. Claessens et al. (2005)). Consequently, group firms may be less inclined to manage earnings for financial contracting reasons but instead focus more on tax minimization.

Second, group affiliations provide member firms with extra flexibility compared to stand-alone entities to manage earnings (Kim and Ji (2006)) and they can act in concert to reduce their average tax burden, by shifting income from a profitable group member to a loss-making firm (Berger and Ofek (1995); Gramlich et al. (2004)). Profitable stand-alone firms, by contrast, lack this flexibility and have to revert to other mechanisms when aiming at tax minimization. Moreover, group membership results in economies of scale for group affiliates' expertise, potentially providing corporate insiders with more experience and discretionary tools to manage the reported earnings performance. Based on these arguments, we conjecture that group firms exploit their specific flexibilities to focus on tax avoiding strategies, eventually resulting in a lower tax burden for group member firms than for independent firms. This leads to our first hypothesis:

H1: *“Ceteris paribus, group firms face a lower effective tax rate compared to independent (non-affiliated) firms”*

3.2 Taxes and pretax profitability

⁹ 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.

The relation between a firm's pre-tax profitability and its effective tax burden is a widely examined issue in empirical tax research. However, the evidence on this relation is rather mixed. Wilkie and Limberg (1993) and Gupta and Newberry (1997) find that a firm's profitability is positively related to its effective tax rate (ETR).¹⁰ Rego (2003) in her study on tax-avoidance activities of US multinational firms, by contrast, builds on a model by Slemrod (2001) who assumes that taxpayers with higher income have lower average and marginal costs of tax avoidance. She finds evidence consistent with this argument: multinational firms with a higher pre-tax income have lower worldwide ETRs compared to multinationals with a lower income (Rego (2003)). Further, Mills et al. (1998) show that larger firms typically have lower average costs of tax planning. Manzon and Plesko (2002) argue that profitable firms have a tax-advantage position relative to less profitable firms since they can benefit more from tax reductions, exemptions and credits, resulting in greater book-tax differences.

Although the relation between a firm's pre-tax profitability and the average effective tax rate remains a concern, following Wilkie and Limberg (1993) and Gupta and Newberry (1997) we hypothesize a positive association between a firm's tax burden and its pre-tax profitability. However, we additionally conjecture that group affiliation allows firms mitigating this positive association between pre-tax income and ETRs. In line with the arguments of Mills et al. (1998), we expect that group firms can benefit from the economies of scale and tax planning investments at the group-level to reduce average tax payments. Furthermore, the flexibility of business groups to manage earnings at the firm level and to shift income from tax-paying to tax-exempt member firms suggests a less positive association between a group firm's pre-tax income and its ETR, compared to independent firms. This suggests the second hypothesis:

H2: *“Ceteris paribus, group firms face a less positive association between pre-tax income and effective tax rates than independent firms”*

3.3 Earnings management and business groups

¹⁰ Wilkie and Limberg (1993) only provide univariate results and do not control for important omitted variable bias problems. Because of the univariate approach the authors use, this study has been criticized and the results are called in question (e.g. Rego (2003)). However, Gupta and Newberry (1997) analyze the ETR issue in a fixed effects panel data estimation framework, which not only controls for multiple variables at a time but also overcomes the problem of firm-specific heterogeneity. These authors also find strong evidence that pre-tax income and ETR are positively related (Gupta and Newberry (1997)).

The accounting and finance literature provides multiple motives for earnings management with capital market and financial contracting motivations being the most widely studied worldwide (e.g. Healy and Wahlen (1999)). Studies on tax-induced earnings management are less common and typically examine whether firms prefer reporting a lower income for tax minimization over reporting a higher income for financial contracting incentives (Shackelford and Shevlin (2001)). Guenther (1994) shows that firms manage earnings to reduce tax burdens, but that firms with higher leverage ratio's (being a proxy for financial contracting costs) are less willing to report lower income. Bartov (1993) finds that, next to financial contracting considerations, tax incentives are important determinants in the timing of asset sales.

The importance of financial contracts and capital market motivations often hampers researchers in finding clear evidence of tax-avoiding reporting behavior (Fields et al. (2001)). Because of their internal capital markets, group firms are potentially less concerned about their individually reported profitability for financial contracting matters, which could enlarge their flexibility in managing earnings for tax minimization. Moreover, in line with the arguments formulated above, group firms could additionally revert to intra-group income (re)allocations, providing them extra flexibility compared to independent firms to manage earnings for tax reasons. The combined effect of facing substantially lower financial contracting costs and having additional earnings management flexibilities at their disposal makes group firms more prone to optimize their individual financial reporting from a tax perspective than independent firms.¹¹ This leads to hypothesis 3:

H3: *“Ceteris paribus, group firms manage firm-level earnings more from a tax-minimizing perspective than independent firms”*

A potential tax-avoidance strategy for group firms is to shift income across group members operating within the same jurisdiction, based on the marginal tax rate status of both firms (Gramlich et al. (2004), Scholes et al. (2002), Yetman (2001)). These income and cost allocations across group firms are generated through intra-group transactions, which eventually result in firm-level adjusted earnings levels. Intra-group income allocation of this kind offers group firms the specific flexibility to adjust the earnings level of each individual

¹¹ Kim and Ji (2006) provide an alternative explanation for accruals management within group-affiliated firms and argue that group-affiliated firms might also manage earnings opportunistically to hide unfair diversion of firm resources. Whereas their arguments are rooted in the ‘tunneling’ or ‘propping’ of firm resources, we focus on taxes as a driver of earnings management in Belgian business groups. Most of the affiliated companies considered in this study are private companies, which makes ‘tunneling’ behavior at the expense of minority shareholders unlikely.

group entity in a desired direction (Scholes et al. (2002)). For independent firms, however, this flexibility does not exist. In line with the argument that group firms are expected to focus more on tax-avoidance because of the lower financial contracting costs they face, the tax status of group firms might be a significant driver of these intra-group transactions. This leads to the following hypothesis:

H4: *“Group firms use intra-group transactions to adjust the individual firms’ pre-tax earnings level in response to their individual marginal tax rate status”*

4. Sample and variables

4.1 Sample

The sample we use contains Belgian non-financial and non-utility firms for which a complete financial statement is available during the 5-year period 1997-2001. During this period, no change in fiscal rules occurred in the Belgian economy. Data for the empirical tests are retrieved through a combination of (i) the April 2003 edition of Belfirst®, a Bureau Van Dijk database containing financial statement information on all listed and unlisted Belgium firms and (ii) the 2002 annual reports of all listed, industry-diversified Belgian holdings to identify all Belgian firms affiliated with a listed holding firm.

We classify our sample firms in two categories: group firms, being affiliated with a listed Belgian holding company, and independent (= non-affiliated) firms, based on the following procedure. First, we identified all holdings listed on Euronext Brussels (formerly the Brussels Stock Exchange), and tracked all Belgian firms that are fully or proportionally consolidated with a listed Belgian holding in the fiscal year 2001. If one of these firms has a consolidated report itself, its Belgian subsidiaries were also incorporated in the group firms’ sample. Second, we classify firms as independent firms based on the Bureau Van Dijk classification of independent firms (= *“any firm in which recorded shareholders have no more than 24.9% of direct or total ownership”*) and additionally exclude firms classified as independent firms but with non-zero intra-group accounts.¹²

For each firm between 1997 and 2002, we included a firm-year observation if (i) the firm has a “normal” legal status in that specific year (i.e. meaning that the firm is operating in a going-

¹² This selection criterion is necessary to control for firms in which external shareholders hold less than 25% ownership and are classified as independent by Bureau Van Dijk, but which are not operating independently *sensu stricto*.

concern way and is not involved in any potential restructuring activity like M&As, buy-out or bankruptcy), (ii) the firm is older than one year at time t and if (iii) sales and total assets are non-zero in the year of interest and in the preceding year.¹³ This resulted in a sample of 1,997 unlisted firms (9,306 firm-years) of which 187 (772 firm-years) are holding group-affiliated and 1,810 firms (8,534 firm-years) are independent firms.

4.2 Effective tax rates

To estimate the difference in relative tax burden between group firms and independent firms, we first examine effective tax rates (ETRs). We compute a firm's *ETR* as the actual taxes paid divided by the firm's pre-tax book income.¹⁴ ETRs summarize the cumulative effect of various tax incentives in one specific statistic (Gupta and Newberry (1997)). Stated alternatively, ETRs measure a firm's proficiency to reduce its current tax liability relative to its pretax result and hence reflect the relative tax burden across firms (Rego (2003)). Corporate ETRs typically vary across firms and time, and have been studied extensively in various tax studies (e.g. Buijink et al. (2002), Gupta and Newberry (1997), Porcano (1986), Rego (2003), Stickney and McGee (1982), Zimmerman (1983)).

Prior research has examined ETRs in relation to a number of firm characteristics like firm size and industry, operational, financial and investment decisions, but this has produced rather mixed conclusions. In line with the political cost hypothesis, Zimmerman (1983) expects larger firms to face higher tax costs due to their higher visibility and public scrutiny. His findings on US data show a positive but non-monotonic relation between ETR and firm size. However, Stickney and McGee (1982) conclude that size is not a significant factor for ETR variation while Porcano (1986) observes an inverse relation, the latter providing evidence consistence with the political clout hypothesis. Further, Stickney and McGee (1982) show that a firm's ETR is affected by its capital structure and asset mix, in that financial leverage and capital intensity are negatively related to a firm's ETR. Gupta and Newberry (1997) reach similar conclusions in a panel data study taking firm-specific effects into account. With

¹³ Further, 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 normal businesses.

¹⁴ Although ETRs expressed as (taxes paid/pre-tax income) is the most commonly used definition for a firm's ETR applied in the literature (Shackelford and Shevlin (2001)), we additionally calculated ETR alternatively as (taxes paid/operating cash flow). If pre-tax income is managed, ETR as a fraction of pre-tax income potentially is a biased measure and could be interpreted as a suboptimal measure of a firm's *real* tax burden (Rego (1999)). In the result description (Section 6), we report descriptive statistics and full regression results with ETR expressed as relative to pre-tax income. For completeness we additionally report results for the alternative ETR measure in Appendix 1. Results are very consistent for both measures, comforting us that we capture a firm's relative tax burden fairly well. Further tests are on accruals management/shifting and focus on a firm's marginal tax rate status, and hence should not suffer from any potential bias of this type.

respect to industry differences, most studies find that ETRs vary considerably across industry sectors (e.g. Crabbe et al. (2005), Gramlich et al. (2004), Gupta and Newberry (1997)).

We are interested in the relation between a firm's operations and ETR and therefore control for a firm's level of pre-tax profitability ($\text{Pre-Tax Income/Total Assets}$). We further control for firm size (*SIZE*) by taking the natural logarithm of total assets level. As in Stickney and McGee (1982) and Gupta and Newberry (1997), we additionally control for a firm's leverage (*LEVERAGE*), measured as $(\text{Total Liabilities/Total Assets})$ and capital intensity (*CAPINT*), measured as $(\text{Gross Property, Plant and Equipment/Total Assets})$.

4.3 Marginal tax rate status

Although the majority of studies on tax research focus on ETRs in isolation, this measure typically is less useful for examining a firm's tax costs of earning additional income.¹⁵ This relation is captured by the marginal tax rate (MTR), 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 real MTR requires the valuation of a firm's net operating loss deduction through simulations of future earnings streams. Graham (1996) and Plesko (2003) show that simulation results have a very high positive correlation with tax rates based on perfect foresight. Plesko (2003), however, 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.

In this study, we apply the binomial approach to model a firm's MTR status under Belgian tax laws. Because the Belgian tax code allows losses to be carried forward indefinitely (cf. Section 2), 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* is larger than the total value of all recorded 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 firms.

5. The empirical accruals-cash flow relation in a tax-avoidance framework

¹⁵ Plesko (2003), for instance, suggests a combination of ETR and MTR as alternative tax measures to properly assess the tax situation of a firm.

This section describes the model we use to analyze the tax-minimizing financial reporting behavior for group firms compared to independent firms. Empirical accounting research often conducts test of accruals behavior in relation to underlying cash flow and reported earnings (e.g. Dechow (1994), Land and Lang (2002), Leuz et al. (2003)). Accruals are accounting adjustments that distinguish reported profit from underlying cash flow levels. They have as a primary function to produce an earnings estimate that is less noisy than operating cash flows (Dechow (1994)). Accrual accounting matches costs and revenues in the period they are realized and hereby reduces fluctuations that would occur on a cash accounting basis. The specific features of accounting accruals have as a natural consequence that operating cash flow and accruals are contemporaneously negatively correlated (Dechow (1994), Dechow et al. (1998)). However, several studies argue that larger magnitudes of this correlation do not reflect a firm's underlying economic performance and correspond to earnings management (e.g. Land and Lang (2002), Leuz et al. (2003), Myers and Skinner. (2005)).¹⁶ In cases of high negative correlations, accounting accruals serve as a buffer in smoothing cash flow shocks and are no longer simple noise reducers to produce a more informative earnings estimate.

Authors have identified several reasons why earnings smoothing can be of interest for a firm. Trueman and Titman (1988) suggest that it might lower investors' estimates of a firm's underlying volatility and risk, eventually reducing their required rate of return. Francis et al. (2004) empirically document that earnings smoothing is rewarded through higher equity prices. These findings suggest an economic pay-off, which allures managers to smooth the reported earnings level. However, apart from capital market motivations, earnings smoothing could also be explained from a tax perspective. In countries with a high alignment between tax accounting and financial accounting – such as Belgium – high taxes are a natural consequence of reporting a high pre-tax income figure. For that reason, firms may want to restrain their pre-tax profit figure through the reporting of negative accruals, especially if they face a positive MTR.

We build on this intrinsic relation between accruals and operating cash flow, and the propensity of firms for tax-avoiding financial reporting behavior. If group firms are less dependent upon financial reporting in contracting matters, a group firm's individual tax status is a potentially important determinant of its financial reporting behavior. Hence, we

¹⁶ Myers and Skinner (2005) find for a sample of US earnings beaters (i.e. firms that are able to report abnormally long consecutive increases in quarterly EPS) a negative correlation between accruals and cash flow, which is significantly more negative than for a set of control firms. Further, Leuz et al. (2003) document that measures based on the correlation approach are highly correlated with other measures of earnings management worldwide and differ substantially across investor protection. Land and Lang (2002) find for a set of 7 countries that the accruals-cash flow negative correlations are higher for countries like Germany, Japan and France compared to Australia, Canada, UK and US and suggest that differences in institutions might explain these findings.

conjecture that the negative association between accruals and cash flows is likely to be affected by a group firm's marginal tax status. More precisely, we expect group firms to reduce their pre-tax earnings levels through reporting negative accruals when they face a positive MTR, while we predict zero MTR firms to compensate at the group level through income-increasing accruals reporting. Stated alternatively, group firms are likely to counterbalance each other's accruals reporting in pursuing low average tax burdens.

The model we apply controls for tax-avoiding accruals reporting dependent on a firm's marginal tax rate status. We run a standard piece-wise regression as adapted from Ball and Shivakumar (2005) between total accruals and operating cash flow on all sample firms, and control for a firm's marginal tax rate status:

$$TACC_t = \alpha_0 + \beta_1 MTR_t + \beta_2 OCF_t + \beta_3 (MTR_t * OCF_t) + \varepsilon_t, \quad (1)$$

With $TACC$ = Total accruals, which are calculated as: $(\Delta Inventory + \Delta Accounts Receivable + \Delta Other Current Assets) - (\Delta Accounts Payable + \Delta Other Current Liabilities) - Depreciation$ and MTR = a dichotomous variable capturing a firm's marginal tax rate status. This variable is equal to one for firms with estimated positive marginal tax rates and zero otherwise. OCF_t is a firm's operating cash flow level, computed as earnings before extraordinary items less total accruals. Total accruals as well as cash flow from operations are deflated by lagged total assets. This model captures differences in the accruals-cash flow relation depending on a firm's marginal tax rate status. Under the hypothesis that firms are more inclined to manage earnings downward when they are in a net tax paying position, a negative incremental effect for β_3 would occur. Further, in line with the intrinsic negative association between accruals and cash flow, we expect a significantly negative coefficient for β_2 and for $(\beta_2 + \beta_3)$.

Independent firms face similar tax regulations and specifications as group firms and are therefore also thought to have parallel tax-reducing earnings management incentives. However, as discussed above, we conjecture that group affiliation makes firms more prone to earnings management in relation to their own tax status, and the tax status of other group members. We therefore extend our model by differentiating between group firms and independent firms to capture differences in earnings management:

$$TACC_t = \alpha_0 + \beta_1 MTR_t + \beta_2 OCF_t + \beta_3 (MTR_t * OCF_t) + \beta_4 Group + \beta_5 (Group * MTR_t) + \beta_6 (Group * OCF_t) + \beta_7 (Group * MTR_t * OCF_t) + \varepsilon_t \quad (2)$$

Group is a dummy variable equal to one if the firm belongs to a business group and zero otherwise. The other variables are defined as above. Provided that group firms contrive their accruals reporting more in response to tax motivations than independent firms, we anticipate a significantly negative coefficient for β_7 . This would correspond to more downward-driven accruals management for group member firms compared to independent firms, provided that the firm faces a positive MTR. If zero-MTR group firms offset this downward-oriented accruals reporting of their positive MTR group affiliates, we expect to find a significantly positive coefficient for β_6 in isolation. We do not predict any specific relation for the combined effect of $(\beta_6 + \beta_7)$. This model is tested in Section 6 to disentangle our sample firms' accruals management behavior in response to their individual marginal tax status and group dependency.

6. Results

6.1 Effective tax rates

We first compare and model the difference in ETR between group-affiliated and independent firms to test the first hypothesis. Consistent with prior ETR research, we remove all firm-year observations with negative ETRs, because ETRs with negative components do not have an economic interpretation and potentially distort the real ETR findings.¹⁷ Also consistent with prior research (e.g. Rego (2003)), we recoded all ETRs greater than one into one to eliminate the effect of extreme values. Finally, we removed observations which were in the top or bottom 1 percent of the pretax income, leverage and size distribution to eliminate the effect of potential outliers. These data adjustments result in a final sample of 7,936 firm-year observations (1,716 firms) with 605 group firm-year observations (143 firms) and 7,331 independent firm-year observations (1,573 firms).¹⁸

¹⁷ Previous studies (Gramlich et al. (2004), Rego (2003), Stickney and McGee (1982), Wilkie and Limberg (1993), Zimmerman (1983)) also remove negative ETR firms from the sample for similar reasons. Negative ETRs indicate that either a firm's tax expense or the reported pre-tax profit is negative, but not both. For firms with a negative pre-tax income and a negative tax expense (corresponding to firms receiving a tax rebate), we recoded the ETR to zero, also consistent with previous studies (e.g. Gupta and Newberry (1997)). Unreported results, however, show that only a marginal fraction of firms are in this position and that including or removing them from the analyses does not alter our general findings.

¹⁸ Note that when we calculate ETR alternatively as (taxes paid/operating cash flow) we maintain 6,715 observations, of which 523 are from group firms and 6,192 are from independent firms. Results of all tests performed on ETRs are consistent for both ETR measures. For reasons of brevity, we here only report test results for ETR relative to pre-tax income and include test results of ETR relative to operating cash flow for completeness in Appendix 1.

insert Table 1 here

Table 1 presents descriptive statistics for the key variables included in multiple ETR regression models and shows differences in mean (median) values between group firms and independent firms. Panel B reports correlation coefficients between the continuous regression variables. Overall, group firms have a significantly lower ETR than independent firms. This evidence is consistent with our hypothesis that group firms, on average, face a significantly lower tax burden than independent firms. Where group firms incur a mean (median) ETR of 22.3% (12.4%), mean (median) values for independent firms reach 28.6% (35.6%). Further, group firms are significantly larger than independent firms: mean (median) total assets for group firms are EUR 2,362,981 (EUR 901,350) versus EUR 1,137,832 (EUR 518,600) for independent firms.¹⁹ Mean and median leverage of group firms is 60.2% (63.3%), being significantly lower compared to the mean (median) leverage for independent firms (70.4%, respectively 76.5%). These univariate findings on leverage suggest that differences in tax burdens between both sets of firms cannot be attributed to the favorable interest deductions, associated with higher leverage levels. Finally, group firms record a higher pre-tax profitability than independent firms, although only with respect to median levels. Within each sample there is substantial variation in size, leverage, capital intensity and pre-tax profitability. Minimum and maximum ETR is restricted to 0 and 100% due to data adjustments described above.

The Pearson (Spearman) correlations in Panel B denote that ETR is negatively related to size, leverage and capital intensity and positively to pre-tax profitability. Leverage is positively related to firm size and negatively related to pre-tax profitability. This positive association between firm size and leverage is consistent with findings in other settings, suggesting that larger firms face less financing constraints than smaller firms (Berger and Udell (1998)). The negative association between pre-tax profits and leverage is also consistent with findings in

¹⁹ The substantial difference in size might raise concern about the comparability of both group and independent firms. In unreported analyses (*available upon request*), we performed detailed descriptive analyses of potential confounding size effects which might potentially drive the differences in ETR. We ranked all sample firms in ascending order, based on ETR levels, and grouped them into 10 deciles. Within each of these 10 deciles, we compute the mean and median ETR as well as size (measured by total sales) of both our group and independent firms. Firm size differentials are statistically insignificant in each of the deciles with exception of the 10th decile where group firms are significantly larger than independent firms. In most deciles, mean (median) ETRs of group firms are significantly smaller than independent firms. To additionally ensure that differences in ETRs between group and independent firms are also measured without the minimum possible confounding effect of industry, we performed additional tests relating to the average ETR across industries. Results indicate that ETRs vary across industries, a finding consistent with Crabbe et al. (2005) in their study on average ETRs in Belgium. Moreover, group firms exhibit significantly lower ETRs than independent firms within each industry, except for the industry with the lowest average ETR, being the Services industry. These results indicate that group firms tax advantage cannot be explained by firm size nor industry membership, suggesting that other elements drive the observed phenomenon.

other institutional settings, although its magnitude is fairly high.²⁰ Larger firms have a higher capital intensity although, surprisingly, also a lower pre-tax profitability.

We employ an OLS multiple regression model to examine (i) the difference in ETR of group firms and independent firms and (ii) the differential relation between firm profitability and ETR, relative on group dependency. We therefore estimate the following equation:

$$\begin{aligned}
 \text{ETR} = & \alpha_0 + \beta_1 \text{PTI}_{it} + \beta_2 \text{GROUP}_{it} + \beta_3 (\text{GROUP} * \text{PTI})_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{LEVERAGE}_{it} \\
 & + \beta_6 \text{CAPINT}_{it} + \sum_{j=7}^{16} \beta_{jt} \text{IND}_{jt} + \sum_{k=17}^{20} \beta_{kt} \text{YEAR}_{kt} + \varepsilon_{it}, \quad (3)
 \end{aligned}$$

with the variables *SIZE*, *LEVERAGE*, *CAPINT* and *PTI* measured as described above. *GROUP* is a dummy variable equal to one for group firms while (*GROUP*PTI*) is the interaction effect of the group affiliation dummy with a firm's pre-tax profitability measure. *IND* is a vector of dummy variables for each one-digit industry sector the firm is operating in. *YEAR* is a vector of dummy variables capturing the year effects. We expect a significantly negative coefficient for β_2 as this corresponds to a lower ETR level for group firms after controlling for other firm characteristics like size, leverage, capital intensity and pre-tax profitability (Hypothesis 1). Moreover, a significantly negative coefficient on β_3 would be consistent with our second hypothesis, suggesting a less positive association between pre-tax profitability and ETRs for group firms.

insert Table 2 here

We present the regression results in Table 2. The first column displays results of the ETR regression with control variables only, the second column includes a dummy for group affiliation and the third column includes group affiliation and group interaction with pre-tax profitability. We run and tabulate regressions without group dummies (Column (1)) to test whether international findings on a firm's ETR also hold in our sample. Consistent with

²⁰ Gramlich et al. (2004) reach similar values for Japanese firms where Spearman correlations between leverage and profitability measures are up to -0.360 . Consistent with the arguments in Gramlich et al. (2004), we suggest that this rather high negative correlation might be caused by Belgian lenders who are less concerned (or are less successful in predicting) the future profitability of their borrowers. An alternative interpretation of this finding results from the self-financing capacity of profitable firms. Unprofitable firms generally have to rely more on external financing since they do not generate sufficient cash flow to finance their business operations, whereas profitable firms do not have this problem and can use these self-generated cash flow to finance future operations.

Wilkie and Limberg (1993) and Gupta and Newberry (1997), we find a positive association between ETR and pre-tax profitability. Further, all regressions yield very consistent estimates and coefficients. The adjusted R² around 14-15% and highly significant F-statistics indicate the appropriateness of our model to explain variations in ETRs. Regression (3) shows that after controlling for industry, year effects and variables relating to size, operational, financial and investment decisions, ETRs are significantly lower for group firms than for independent firms. The dummy variable for group membership has a significant coefficient of -0.066 and suggests that group firms have a 6.6% lower ETR than independent firms. The significantly negative coefficient for the interaction term (*Group*PTI*) further suggests that group firms experience a significantly less positive association between pre-tax income levels and ETR than independent firms ($\beta_3 = -0.345$; $t = -4.38$).²¹ Both findings provide evidence in line with our hypotheses (1) and (2). Further, we find that the control variables are significantly associated with the ETR levels in a way that is consistent with global findings on ETR and firm characteristics. Larger firms experience higher ETRs, while highly levered and capital-intensive firms face lower ETR levels.

6.2 Marginal tax rate status as determinant of the accruals-cash flow association

The results in Table 2 confirm that group firms have a lower tax burden than independent firms and also suggest that group firms are more able to combine high pre-tax profitability with relatively low ETR levels. The evidence based on the ETR measures in isolation, however, does not allow differentiating on tax avoiding accruals reporting behavior of group and independent firms. We investigate the role of tax-avoiding accruals reporting with the model proposed in Section 5.

 insert Table 3 here

Table 3 reports the distributional properties of total accruals, operating cash flows, leverage and total assets for group firms and independent firms (1 = group firm; 0 = independent firm), and for firms with a positive MTR and firms with a zero MTR (1 = positive MTR; 0 = zero

²¹ As described, data specifications on ETR limit its value to [0,1]. However, OLS estimations can give fitted values that are negative and values greater than one. As a robustness check, we therefore performed a logit transformation on the ETR measure and reran the regression, leading to similar conclusions.

MTR). Mean total accruals are lower for firms with a zero MTR-status, irrespective of the group membership status. However, when group firms are subject to taxation ($MTR=1$), total accruals reach the lowest in-sample values ($p1 = -0.639$). Conversely, tax-exempt group firms have the highest in-sample total accruals ($p99 = 0.778$), resulting in a right-skewed distribution. Interestingly, for positive MTR firms the average and maximum operating cash flows is higher for group firms than for independent firms. For $MTR=0$ firms, we observe the opposite: average and minimum operating cash flows are lower for group firms than for independent firms. In combination, these descriptive findings suggest that accruals are not randomly distributed across a group firm's MTR status and are potentially influenced by a firm's pre-tax operating cash flow level.

With respect to leverage, differences across the categorical variables are highest for positive MTR group firms (mean leverage = 55.7%) and zero MTR independent firms (mean leverage = 76.5%). The figures on total assets show that tax-exempt group firms ($MTR=0$) are smaller in size than group firms with a positive MTR status. For independent firms, this difference is also observed across a firm's MTR-status, although it is less clear.

We further investigate the effect of MTR status and group membership on the accruals-cash flow relation by running an OLS regression based on models (1) and (2). Results are displayed in Table 4.

insert Table 4 here

Regression (4) shows a significantly negative association between accruals and cash flow for firms with a positive MTR status ($\beta_2 + \beta_3 = -0.81$).²² The coefficient on β_3 , measuring the difference in association between accruals and cash flow for firms with a positive MTR status, is significantly positive but its magnitude is rather low ($\beta_3 = 0.07$; $t = 4.87$). These results suggest that, on average, accruals offset cash flows to a large extent and firms with a positive MTR have a slightly lower propensity to employ accruals to smooth the reported cash flow level.

However, when we differentiate between group firms and independent firms (regression (5)), we find that group membership strongly affects the relation between accruals and cash flows.

²² In Appendix 2, we provide a detailed description on the interpretation and significance levels of the combined coefficients, both for the models with and without group dependency. For reasons of fluency, we do not provide extensive detail on these calculations and their associated significance levels in this result description section.

Group firms with a positive MTR offset operating cash flows significantly more with accruals, compared to independent firms with a positive MTR ($\beta_7 = -0.13$; $t = -4.40$). By contrast, tax-exempt group firms (MTR=0) offset operating cash flows by about 10.3% less than tax-exempt independent firms (β_6). Hence, although the combined effect of ($\beta_6 + \beta_7$) is small and insignificantly different from zero ($t = 0.45$) and does not indicate a differential accruals – cash flow relation between group and independent firms, the individual effects of β_6 and β_7 in isolation highlight the potential tax-strategic accruals recognition for group firms. Whereas group firms that are subject to tax offset the pre-tax OCF substantially more than independent firms through compensating accruals, tax-exempt group firms compensate at the group level and report less counterbalancing accruals.

One might potentially be concerned that the differential pattern between group and independent firms in the observed accruals – cash flow association is potentially driven by differences in a firm's size or leverage. We therefore extend model (2) by adding size and leverage as independent variables.²³ Results of regression (6), are very similar to those of regression (5). The MTR status of group firms remains an important determinant of the accruals – cash flow relation, which suggests that group firms optimally balance their firm-level accruals to minimize taxes.

6.3 Intra-group transactions

Although the accruals – cash flow regressions suggest tax-motivated accruals reporting for group firms, we do not know whether these are facilitated and/or driven by the specific intra-group affiliations and/or transactions. To disentangle this issue, we examine the changes in intra-group transactions that affect pre-tax profits of individual group members. Intra-group transactions may be used as flexible instruments to optimally balance the firm-specific earnings level of each group member.

According to Belgian GAAP, group firms have to disclose the amount of intra-group receivables and intra-group payables in the notes accompanying the financial statement. Hence, for group firms we can verify which part of receivables and payables is group-related and which part is not. Reported intra-group receivables (payables) consist of trade receivables (payables) and financial receivables (payables). While intra-group receivables are primarily

²³ Size is measured as the rank of total assets, standardized to the interval [0,1]. We interacted size and leverage with the variables of interest, leading to similar results. We do not report these results for reasons of brevity (available upon request).

trade receivables, intra-group payables often consist to a significant extent of short-term financial debt (see Deloof and Jegers (1996) and Verschueren and Deloof (2006)). To avoid the interference of financial debt transactions, we focus on intra-group receivables only as a group-specific accruals component. Although not all intra-group receivables are discretionary, we hypothesize that business groups have substantial flexibility in adjusting these intra-group receivables.

insert Table 5 here

Panel A of Table 5 shows levels and changes in intra-group receivables for all group firms ($N=605$), expressed (1) as a proportion of total assets and (2) as a proportion of total receivables outstanding. Results show that for about 70 per cent of all group-firm observations, intra-group receivables are non-zero. On average, intra-group receivables make up 29.6% of total receivables (median = 11.9%) and 10.8% of total assets (median = 2.7%). Further, for about 25 per cent of all group firms, more than half of total receivables consist of intra-group receivables. For about 10 per cent of all group firm-years, the proportion of intra-group related receivables is even higher than 90% of total receivables. On average, year-on-year changes in these intra-group receivables are small (mean = 1.6% and median = 0.0%), but vary considerably between a minimum of -87.5% and a maximum +94.6% of its preceding year's value.

We investigate if and how changes in intra-group receivables are related to the firm's operating cash flow level, again conditioning for a firm's MTR status. This analysis can provide further insight in how group firms adjust the discretionary component of their accruals via adjustments in these intra-group receivables. Specifically, if adjustments in intra-group receivables are negatively related to a firm's OCF, this suggests that discretionary recognition of intra-group receivables potentially serves as a tool to smooth the pre-tax OCF. If this behavior is particularly observed for MTR=1 group firms, the tendency to smooth pre-tax OCF would be higher for tax paying group firms. Hence, we model the year-on-year changes in intra-group receivables for the subset of group firm-years as a function of the firm's OCF level and additionally condition for the MTR status. This results in the following model:

(4)

$$\Delta(IG_REC)_t = \alpha_0 + \beta_1 MTR_t + \beta_2 OCF_t + \beta_3 (MTR_t * OCF_t) + \varepsilon_t ,$$

$\Delta(IG_REC)$ is the year-on-year change in intra-group receivables. MTR and OCF are defined as above. We estimate this model for the sample of group firms only. Consistent with our hypothesis 4, we expect a significantly negative coefficient on $(\beta_2 + \beta_3)$, as this would imply that intra-group receivables contribute to the tax-motivated accruals management of group firms. With respect to β_3 we expect a significantly negative coefficient, suggesting a higher smoothing behavior via intra-group receivables if a firm faces a positive MTR status.

However, there are some potential dynamics that might work against our hypothesis that intra-group receivables serve as a discretionary tool in tax-adjusting the reported profit figure. Intra-group receivables are easily observable accrual components, which might be scrutinized extensively by the fiscal authorities. Moreover, group firms can use an extensive battery of other mechanisms which affect reported profit levels, and which are not clearly observable in the financial statement such as transfer pricing or pure operational decisions.

The estimation results for model (4) are reported in Panel B of Table 5. Regressions are based on group firms only ($N=605$). In Regression (7), we find a negative and significant relation between a group firm's OCF level and the changes in intra-group receivables ($\beta_1 = -0.126$; $t = -5.16$). This suggests that, on average, intra-group receivables indeed smooth a group firm's pre-tax OCF level. However, Regression (8) shows that this negative association is not significantly different for positive MTR group firms and zero MTR group firms. The coefficient for β_3 , measuring the incremental association for positive MTR group firms, is low and insignificantly different from zero. We infer from these combined results that changes in intra-group receivables indeed contribute to a smooth pre-tax OCF level, but that they do not differ across a group firm's MTR status.

Panel A of Table 5 showed that only a fraction of all group firms have substantial intra-group receivables. We therefore re-estimate model (4) for a subset of group firms with high proportions of intra-group receivables. Regression (9) is based on these group firms with values for intra-group receivables being larger than 5% of their total assets ($N=201$).²⁴ The coefficient on β_2 is significantly negative and suggests that zero MTR group firms with high

²⁴ We also estimated regressions where the cut-off point for the proportion of intra-group receivables is 7.5%, 10%, 12.5%, 13.6 (median) and 15% respectively. The results are robust to changes in the cut-off point. We additionally performed regression analyses for the total sample of group firms ($N=605$) and interacted the variables of interest, OCF and MTR with the dummy for high versus low proportions of intra-group receivables to total receivables (where this dummy was set equal to one when the proportion was above one of the predefined cut-off levels). Again, the results are qualitatively the same.

intra-group receivables levels smooth OCF levels via changes in these intra-group receivables by some 22.4%. Interestingly, we now observe a significantly stronger negative association between intra-group accruals and OCF for positive MTR firms than for zero MTR firms ($\beta_3 = -0.26$; $t = -2.32$). This suggests that net tax-paying group firms with a substantial amount of intra-group receivables use this specific accruals component by some 26.0% more, compared to similar tax-exempt group firms, in adjusting their reported profit level. The combined findings suggest that intra-group receivables adjustments indeed help in smoothing the pre-tax income levels and that specific group firms rely more on this mechanism than others.

6.4 Sensitivity checks

We performed a number of sensitivity checks to further corroborate our general findings. All results are available from the authors upon request. First, we included additional control variables in the OLS regression of model (3), which estimates the determinants of the ETR. Following Gupta and Newberry (1997), we incorporated R&D intensity (measured as R&D expenses/Total Sales) and inventory intensity (measured as Inventory/Total Assets). R&D intensity is included to capture the tax benefits resulting from the tax-deductibility of R&D expenses (Gupta and Newberry (1997)). Unlike R&D or capital intensity, inventory intensity is not likely to be associated with substantial tax benefits, which suggests higher tax rates for inventory intensive firms (Gupta and Newberry (1997)). Adding these additional control variables to our regression model (3) does not alter our results, nor does it affect the explanatory power of the model employed.

Second, we additionally controlled for the ratio of long-term equity investments to total assets. In Belgium, if a firm receives dividends from another firm, the tax rate on the dividends is reduced by 95% if a number of conditions are met. This tax exemption might have a substantial impact on the ETR if a firm has significant long-term equity investments. Group firms may on average have a larger part of their pre-tax results taxed at a reduced rate. We find that group firms on average indeed have a higher proportion of equity investments to total assets. Incorporating this variable as an additional explanatory variable in regression (3), however, does not alter the regression results on all other explanatory variables, comforting us that long-term equity investments do not drive the ETR results.

Third, since our dataset contains cross-sectional time-series data and it is well known that panel data estimations have several advantages across cross-sectional estimation methods in

this context, we additionally estimated our ETR regression models with panel data estimation techniques. Since one variable of interest, namely GROUP, remains constant over time, we cannot rely on fixed effects panel regressions (see e.g. Baltagi (2001)). The Hausman test, however, indicates that in all regression specifications performed in our analyses, fixed effects models are potentially more appropriate than random effects models. One way to overcome this problem is running Hausman-Taylor panel regressions which allow for correlation between the firm-specific characteristics and (some of) the explanatory variables in combination with a time-invariant exogenous variable.²⁵ Generally, the results do not differ substantially in the panel data regressions compared to the OLS regression, providing sufficient confidence that the OLS results reported above are robust.

Fourth, we additionally investigated the reporting of discretionary accruals for positive cash flow firms with a positive MTR. If tax-avoidance is a primary driver of financial reporting decisions, positive cash flow firms with a positive MTR are likely to apply discretionary earnings management actions to reduce the pre-tax profit. We analyzed differences in discretionary accruals management between group firms and independent firms with positive MTR status and positive pre-tax OCF. To quantify the discretionary component of a firm's accruals figure, we segregated total accruals in discretionary and non-discretionary accruals through the estimation of yearly cross-sectional sector peer regressions. More extensive details on the discretionary accruals management regressions are reported in Appendix 3. We find that positive MTR group firms reduce positive pre-tax OCF levels significantly more than independent firms via discretionary accruals. These findings provide further evidence of tax-minimizing financial reporting by group firms.

7. Conclusion

While there have been many studies on different aspects of business groups, very few studies focus on the tax effects of business groups. In this paper, we find that Belgian firms affiliated to a listed business group (=holding) face lower effective tax burdens than independent firms. Group firms also have a less positive association between pre-tax income and tax burdens. These findings suggest that earnings of individual group members are managed in order to minimize taxes at the group level. We hypothesize that group firms strategically manage firm-level earnings levels and allocate earning components across member firms depending on

²⁵ This estimation technique is similar to running an IV model in which the instruments are endogenously chosen and is a variant of a 2 stage least squared regression. For further information, we refer to Baltagi (2001)).

their marginal tax rate status. We provide evidence consistent with these hypotheses, in that (1) group firms smooth earnings significantly more (respectively: less) via accounting accruals compared to independent firms when they face a positive (respectively: zero) marginal tax rate, and (2) adjustments in intra-group receivables are detected as one of the instruments to alter the reported profit level in function of a firm's tax status.

To our knowledge, this paper is the first to show that group firms manage pre-tax earnings levels more in response to tax-incentives than independent firms, hereby providing an important contribution to the growing literature on financial reporting characteristics in business groups (Gramlich et al. (2004), Kim & Ji (2006)). The current results suggest that when firms are less dependent on financial contracts because of business group affiliations, tax avoidance incentives outweigh the financial contracting incentives to report positively adjusted income. Our results also suggest that intra-group transactions are instruments in the tax avoidance reporting behavior of group firms. All findings are robust to alternative model specifications, variable definitions and earnings management measures.

These results have important implications for several economic stakeholders. They suggest that tax incentives bias the individually reported financial statements of group firms, leading to a misrepresentation toward external users. Banks, creditors and suppliers who are not fully considering a group firm's individual tax situation, its willingness and capability to manage earnings and to shift income, may be misled by the individual financial statements. Moreover, tax-induced earnings management in business groups leads to foregone income for the tax authorities, as it results in lower overall tax payments. Finally, tax-motivated income shifts across group members may not only minimize tax payments at the group level, but may also lead to wealth expropriation of minority shareholders of those group firms for which earnings are managed downward.

8. Appendices

Appendix 1: Test results for an alternative effective tax rate measure (ETR_{OCF}): (taxes paid/operating cash flow)

Table A1.1 Difference in mean (median) ETR_{OCF}

Variable	Group Membership	N	Mean	Median	Min.	Max.	Decile 1	Decile 9
ETR_{OCF}	1	523	0.147	0.019	0.000	1.000	0.000	0.467
	0	6,192	0.166	0.044	0.000	1.000	0.000	0.498
<i>Diff. in mean (median)</i>			-0.019*	-0.025***				

Table A1.1 contains descriptive statistics for the alternative ETR measure (ETR_{OCF}), measured as (taxes paid/operating cash flow) and checks for potential confounding effects of using biased (i.e. managed) pre-tax income figures in the denominator of the variable. The number of available observations reduces from 7,936 in the initial results to 6,715 for this alternative measure. Both mean and median ETR_{OCF} are substantially lower than the original ETR measure: mean (median) ETR_{OCF} equals 14.7% (1.9%) for group firms compared to 16.6% (4.4%) for independent firms. Results remain significantly different, but only at the 10% level with respect to median values.

Table A1.2 ETR_{OCF} Regression Results

Dependent Variable: ETR_{OCF}	Regression (A1)	
$Intercept_{i,t}$	0.248***	(10.73)
$PTI_{i,t}$	1.143***	(32.27)
$Group_{i,t}$	-0.036***	(-3.72)
$Log(TA)_{i,t}$	-0.001	(-0.61)
$Leverage_{i,t}$	-0.170***	(-15.48)
$Capital Int._{i,t}$	-0.154***	(-13.25)
Sector dummies	Included	
Year dummies	Included	
Adjusted R ²	0.294	
F-statistic	164.06	
Sample size	6,715	

Table A1.2 presents coefficients (*t*-statistics) of an OLS regression model that examines determinants of average ETR_{OCF} with differential effects for group member and independent firms. We refer to Table 3, Column (1) for a full model description and definition of all variables. Further, *t*-statistics are White-corrected and significance levels are denoted by *** ($p < 0.01$), ** ($p < 0.05$) and * ($p < 0.10$). Regression results show a similar picture as the regression of the original ETR measure (Table 3, Column (1)). The group dummy equals -0.036 ($t = -3.72$), suggesting a significantly lower ETR_{OCF} for group firms compared to independent firms, after controlling for other firm characteristics like size, leverage and capital intensity. Note that we explicitly do not model the relation with pre-tax profitability (nor the interaction of profitability with the group dummy) with this alternative ETR_{OCF} measure, particularly since ETRs expressed as a fraction of operating cash flow is introduced to control for potential bias of managed pre-tax income figures. Descriptive statistics above as well as regression A1 show a consistent picture, namely that group firms face a lower ETR independent of the denominator used.

Appendix 2: *t*-Statistics and interpretation of combined coefficient effects for regression of total accruals on operating cash flow, MTR and group status

Model (2) is an extension of the model initiated in Dechow et al. (1998) and Ball and Shivakumar (2005) and models a firm's total accruals in a piece-wise linear regression framework on the level of operating cash flow, a firm's MTR status and group membership. For a detailed description of the model and sample properties, we refer to Section 4.4. We summarize the full model below, formulate expected signs for combined regression coefficients and report calculated *t* statistics on combined coefficients. The model identifying different accruals reporting behavior for positive and zero MTR firms, depending on a firm's group status, goes as follows:

$$TACC_t = \alpha_0 + \beta_1 MTR_t + \beta_2 OCF_t + \beta_3 (MTR_t * OCF_t) + \beta_4 Group + \beta_5 (Group * MTR_t) + \beta_6 (Group * OCF_t) + \beta_7 (Group * MTR_t * OCF_t) + \varepsilon_t \quad (A1-1)$$

With *TACC* = Total accruals, which are calculated as: (Δ Inventory + Δ Accounts Receivable + Δ Other Current Assets) – (Δ Accounts Payable + Δ Other Current Liabilities) – Depreciation and MTR = a dichotomous variable capturing a firm's marginal tax rate status. This variable is equal to one for firms with estimated positive marginal tax rates and zero otherwise. *OCF_t* is a firm's operating cash flow level, computed as earnings before extraordinary items less total accruals. Total accruals as well as cash flow from operations are deflated by lagged total assets. Additionally, *Group* is a dummy variable and is set equal to one if the firm belongs to a Belgian holding group and zero otherwise. The table listed below summarizes the expected sign and interpretation of combined coefficients of regression (6) in Table 4. *t*-Statistics summarizing the significance of combined coefficients are computed as follows: $(\beta_i + \beta_j) / [\text{Var}(\beta_i) + \text{Var}(\beta_j) + 2\text{Cov}(\beta_i, \beta_j)]^{1/2}$ and significance levels are denoted by *** (p<0.01), ** (p<0.05) and * (p<0.10).

Table A2.1: Significance levels and interpretation of combined coefficients for the accruals – cash flow relation, differentiating for MTR status and group dependency

Sample	Predicted Action	(Combined) Coefficient	Value (<i>t</i> statistic)
Independent firms	Independent firms use accruals to manage (i.e. smooth) pre-tax earnings levels (-)	$(\beta_2 + \beta_3) < 0$	-0.870 ^{***} (-43.74) ^{***}
	Independent firms smooth earnings more (-), respectively less (+) when they face a positive marginal tax rate (MTR) status	$(\beta_3) < \text{or} > 0$	0.073 ^{***} (4.57) ^{***}
Group firms	Group firms use accruals to manage (i.e. smooth) pre-tax earnings levels (-)	$(\beta_2 + \beta_3) + (\beta_6 + \beta_7) < 0$	-0.863 ^{***} (-16.20) ^{***}
	Group firms smooth earnings more (-), respectively less (+) when they face a positive marginal tax rate (MTR) status	$(\beta_3 + \beta_7) < \text{or} > 0$	0.016 (0.76)
Group versus independent firms	Group firms use accruals <i>more/less than independent firms</i> in the management (i.e. smoothing) of pre-tax earnings levels (- /+)	$(\beta_6 + \beta_7) < 0$	0.007 (0.45)
	Group firms manage earnings <i>less</i> via accruals smoothing when facing a <i>zero MTR status</i> , compared to independent firms (+)	$(\beta_6) > 0$	0.096 ^{***} (4.12) ^{***}
	Group firms manage earnings <i>more</i> via accruals smoothing when facing a <i>positive MTR status</i> , compared to independent firms (-)	$(\beta_7) < 0$	-0.089 ^{***} (3.13) ^{***}

Appendix 3: Sensitivity test on discretionary accruals versus accruals for positive MTR firms

We further corroborate the accruals – cash flow relation of group and independent firms by modeling a regression similar to (1) for positive cash flow firms that face a positive MTR status. For these firms, compensating (i.e. downward-oriented) accruals management is important from a tax-avoiding perspective, irrespective of a firm’s group status. If tax-avoidance is a primary driver of a firm’s financial reporting decisions, positive cash flow firms with a positive MTR are likely to apply discretionary earnings management actions to reduce the pre-tax profit, ultimately resulting in a lower tax burden. These tax-motivated actions then should show up as abnormal accrual decisions, reducing the operating cash flow levels. We analyzed differences in discretionary accruals management between group firms and independent firms.

To quantify the discretionary component of a firm’s accruals figure, we performed discretionary accruals management tests, in which we segregated total accruals in discretionary and non-discretionary accruals through the estimation of yearly cross-sectional sector peer regressions. The total extent of earnings management in our sample and control firm is estimated by running multiple cross-sectional 2-digit sector peer regressions as suggested in Jones (1991) and in Dechow et al. (1995). The cross-sectional variant of the original Jones (1991) model, estimates the firm-level discretionary accruals by regressing total accruals on a firm’s change in sales and the level of gross property, plant and equipment. Algebraically the Jones (1991) model (JM) goes as follows:

$$TotAcc_{it} = \alpha_0 + \beta(\Delta Sales)_{it} + \gamma(GPPE)_{it} + \varepsilon_{it} \quad (A2-1)$$

Where $TotAcc$ = total accruals, measured by the balance sheet approach as $(\Delta inventory + \Delta debtors + \Delta other\ current\ assets) - (\Delta creditors + \Delta other\ current\ liabilities) - depreciation$, $\Delta Sales$ is the year-on-year change in sales and $GPPE$ is the firm-level of gross property, plant and equipment. The Modified Jones model, as first applied in Dechow et al. (1995), extends this regression by removing all changes in receivables from changes in sales levels. Dechow et al. (1995) argue that not all receivables outstanding are nondiscretionary and suggest a correction for the total amount of receivables. This leads to the following Modified Jones model (MJM):

$$TotAcc_{it} = \alpha_0 + \beta(\Delta Sales - \Delta REC)_{it} + \gamma(GPPE)_{it} + \varepsilon_{it} \quad (A2-2)$$

We compute a firm's discretionary accruals by running these estimation models on 2-digit sector peers for all years separately, being 1997-2001. With respect to the yearly cross-sectional accruals regression we report the following information. There are sixty (60) 2-digit sector codes ranging from 01 (agriculture) to 99 (extra-territorial organizations).²⁶ 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 independent firms are represented in 48 two-digit sectors, resulting in 240 (=48 x 5) sector-year regressions. The mean (median) number of available sector peers used in the regressions is 473 (299) and varies between a minimum of 33 (Sector 18 (Textiles) in 1998) and 2,887 (Sector 51 (Retail) in 2000). More detailed information on regression coefficients and estimates are available on request.

We further model a firm's calculated discretionary accruals level as a function of its operating cash flow and group status. Consistent with the argumentation that if tax motivations are equally important for group and independent firms, we expect the negative association between OCF and discretionary accruals to be equal for both type of firms. However, if group firms indeed have more flexibilities to focus on tax avoidance, we expect a significantly more negative association between our discretionary accruals proxy and the OCF level. The model is similar to model (1) but replaces total accruals by its discretionary component:

$$DA_{it} = \alpha_0 + \beta_1 Group_t + \beta_2 OCF_{it} + \beta_3 (Group * OCF)_{it} + Controls + \varepsilon_{it}, \quad (A2-3)$$

Where DA = discretionary accruals, measured alternatively under the two above-defined models (i.e. Jones (1991) and Modified Jones (1995)). Group is a dummy equal to one if a firm is part of a holding and zero otherwise; OCF_t is a firm's operating cash flow level, computed as earnings before extraordinary items less total accruals. Controls are size (measured as the rank of total assets, standardized to the interval [0,1]) and leverage (total liabilities/total assets). Both earnings management proxies are highly correlated, yield very similar discretionary accruals results and do not lead to different conclusions in our multivariate regressions. Hereafter, we report the result of the model with the Modified Jones

²⁶ Note that not each 2-digit sector is assigned. E.g. Sector 01 refers to Agriculture and Fishing and 02 refers to Forestry. Sector 03 and 04 are not assigned which makes Sector 05 (Minerals) the next in line. Between the codes 01 and 99, 40 two-digit sectors are non-assigned resulting in 60 different two-digit sector classification.

(1995) discretionary accruals. Results for all three regressions (without and with control variables) all yield consistent results that the negative association between discretionary accruals and operating cash flow is more negative for group firms than for independent firms.

Table A2.1 : Discretionary accruals – cash flow relation for positive OCF and positive MTR firms.

Dependent Variable:		Regression (A2-1)		Regression (A2-2)		Regression (A2-3)	
<i>Discretionary Accruals</i>							
<i>Intercept_{i,t}</i>	(β_0)	0.059***	(25.77)	0.080***	(22.70)	0.161***	(35.57)
<i>OCF_{i,t}</i>	(β_1)	-0.548***	(-36.39)	-0.567***	(-37.47)	-0.607***	(-45.11)
<i>Group_{i,t}</i>	(β_2)	0.068***	(7.69)	0.071***	(8.16)	0.043***	(5.60)
<i>GroupxOCF_{i,t}</i>	(β_3)	-0.221***	(-5.18)	-0.202	(-4.97)	-0.158***	(-4.40)
<i>Size</i>	(β_4)	-	-	-0.039	(-7.97)	-0.032***	(-7.37)
<i>Leverage</i>	(β_5)	-	-	-	-	-0.123***	(-24.88)
Adjusted R ²			0.249		0.258		0.262
Number of observations			5,178		5,178		5,178

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9. Tables and figures

TABLE 1
*Descriptive Statistics and Correlation Matrix for Effective Tax Rate OLS Regression Variables **

Panel A: Descriptive Statistics

Variable	Group Membership	N	Mean	Median	Minimum	Maximum	Decile 1	Decile 9	Stdev.
ETR	1	605	0.223	0.124	0.000	1.000	0.000	0.503	0.253
	0	7,331	0.286	0.356	0.000	1.000	0.000	0.558	0.246
<i>Difference in mean (median)</i>			-0.063***	-0.232***					
Total Assets (in 000 EUR)	1	605	2,363	901	125	35,795	1,062	5,926	4,557
	0	7,331	1,138	519	192	14,031	2,114	2,731	1,762
<i>Difference in mean (median)</i>			1,225***	382***					
Leverage	1	605	0.602	0.632	0.003	1.536	0.156	0.957	0.292
	0	7,331	0.704	0.765	0.057	1.193	0.315	0.986	0.246
<i>Difference in mean (median)</i>			-0.102***	-0.133***					
Capital Intensity	1	605	0.210	0.115	0.000	0.986	0.001	0.559	0.238
	0	7,331	0.265	0.173	0.000	0.998	0.009	0.793	0.276
<i>Difference in mean (median)</i>			-0.055***	-0.062***					
Pre-tax Income	1	605	0.047	0.034	-0.677	0.543	-0.064	0.211	0.141
	0	7,331	0.041	0.018	-0.178	0.394	-0.003	0.129	0.066
<i>Difference in mean (median)</i>			0.006*	0.016***					

Panel B: Correlation Matrix (Pearson above, Spearman below the Diagonal)

	ETR	Log(TA)	Leverage	Pre-tax Income	Capital Intensity
ETR	1.000	-0.058 (<0.001)	-0.074 (<0.001)	0.219 (<0.001)	-0.304 (<0.001)
Log(TA)	0.026 (0.019)	1.000	0.084 (<0.001)	-0.113 (<0.001)	0.292 (<0.001)
Leverage	-0.105 (<0.001)	0.122 (<0.001)	1.000	-0.403 (<0.001)	-0.007 (0.513)
Pre-tax Income	0.341 (<0.001)	-0.159 (<0.001)	-0.503 (<0.001)	1.000	-0.152 (<0.001)
Capital Intensity	-0.233 (<0.001)	0.139 (<0.001)	-0.195 (<0.000)	-0.056 (<0.001)	1.000

* Panel A provides descriptive statistics on group and independent firm's Effective Tax Rates (ETR; measured as taxes paid divided by pre-tax income), natural logarithm of Total Assets (Log(TA)), Leverage (measured as total liabilities divided by total assets), Pre-tax income (measured as pre-tax income divided by total assets) and Capital Intensity (measured as gross property, plant and equipment as a proportion of total assets). Differences in mean (median) between holding group member firms and independent firms are displayed and *t*-tests, respectively Mann-Whitney U tests statistics are performed to determine the significance levels. Note that * denotes significance at the 10% level, ** significance at the 5% level and *** significance at the 1% level. Panel B provides Pearson and Spearman correlations between the continuous variables of interest, with Pearson correlations displayed above the diagonal and Spearman correlations below the diagonal.

TABLE 2
OLS Regression Results on Determinants of Effective Tax Rates and
Differences between Group Member versus Independent Firms *

Dependent Variable: ETR	Regression (1)		Regression (2)		Regression (3)	
<i>Intercept</i> _{<i>i,t</i>}	0.213***	(8.79)	0.206***	(8.57)	0.193***	(7.95)
<i>PTI</i> _{<i>i,t</i>}	0.590***	(15.31)	0.577***	(15.02)	0.683***	(15.07)
<i>Group</i> _{<i>i,t</i>}	-	-	-0.082***	(-8.05)	-0.066***	(-6.09)
<i>(GroupxPTI)</i> _{<i>i,t</i>}	-	-	-	-	-0.345***	(-4.38)
<i>Log(TA)</i> _{<i>i,t</i>}	0.011***	(4.56)	0.013***	(5.47)	0.014***	(5.70)
<i>Leverage</i> _{<i>i,t</i>}	-0.022*	(-1.87)	-0.031**	(-2.59)	-0.024*	(-2.04)
<i>Capital Int.</i> _{<i>i,t</i>}	-0.217***	(-18.13)	-0.237***	(-19.48)	-0.236***	(-19.44)
Sector dummies	Included		Included		Included	
Year dummies	Included		Included		Included	
Adjusted R ²	0.136		0.143		0.147	
F-statistic	79.10		78.86		75.72	
Sample size	7,936		7,936		7,936	

* This table presents coefficients (*t*-statistics) of an OLS regression model that examines determinants of average tax burdens of sample and control firms (Regression (1)) and additional differential effects for group member firms (Regression (2) and (3)). The model is defined below in its full form, i.e. containing variables that control for the differential effects for group member firms, both in the intercept and the interaction effect with pre-tax profitability. The dependent variable, ETR, measures a firm's average tax burden and is equal to the ratio of effective taxes paid on pre-tax income. Independent variables are the natural logarithm of total assets (*SIZE*), the firm's leverage ratio measured as total liabilities/total assets (*LEVERAGE*), the proportion of gross property, plant and equipment on total assets (*CAPITAL INTENSITY*) and pre-tax income on total assets (*PTI*, measure for *PROFITABILITY*). *Group* controls for differential effects in ETR between group firms and independent firms; *Group*PTI* controls for potential differences in the relationship between pre-tax profitability and ETR across group firms and independent firms. Both year- and sector dummies are included in the model but not tabulated (*available upon request*). The total sample contains 7,936 firm-year observations for the period 1997-2001. *t*-statistics are White-corrected and significance levels are denoted by *** (p<0.01), ** (p<0.05) and * (p<0.10).

Model:

$$ETR = \alpha_0 + \beta_1 PTI_{it} + \beta_2 GROUP_{it} + \beta_3 (GROUP * PTI)_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 CAPINT_{it} + \sum_{j=7}^{16} \beta_{jt} IND_{jt} + \sum_{k=17}^{20} \beta_{kt} YEAR_{kt} + \varepsilon_{it}$$

TABLE 3
*Distributional Characteristics of Variables of Interest Across Marginal Tax Rate Status and Group Membership **

Variable	MTR Status	Group membership	N	1 st	Percentile 10 th	Median	90 th	99 th	Mean	Skewness
Total Accruals	0	0	1,103	-0.359	-0.196	-0.053	0.054	0.386	-0.057	0.859
		1	213	-0.547	-0.262	-0.065	0.201	0.778	-0.046	1.697
	1	0	6,228	-0.335	-0.156	-0.019	0.125	0.431	-0.015	0.801
		1	392	-0.639	-0.209	0.012	0.205	0.579	-0.016	0.807
OCF	0	0	1,103	-0.387	-0.076	0.036	0.163	0.343	0.038	-0.965
		1	213	-0.769	-0.268	0.026	0.225	0.415	-0.001	-1.334
	1	0	6,228	-0.391	-0.082	0.067	0.228	0.406	0.064	-0.598
		1	392	-0.493	-0.074	0.111	0.324	0.750	0.098	-0.761
Leverage	0	0	1,103	0.144	0.405	0.821	0.994	1.155	0.765	1.193
		1	213	0.011	0.256	0.748	1.023	1.371	0.703	-0.277
	1	0	6,228	0.090	0.305	0.751	0.985	0.998	0.693	-0.687
		1	392	0.016	0.116	0.605	0.907	0.990	0.557	-0.374
Total Assets (in EUR 000)	0	0	1,103	393	1,466	4,371	27,545	105,890	10,752	3.835
		1	213	317	1,112	6,879	24,636	160,930	15,235	4.877
	1	0	6,228	494	2,269	5,336	27,306	97,388	11,489	3.658
		1	392	163	1,003	10,911	76,079	287,378	28,480	3.482

* This table reports the 1st, 10th, 50th (median), 90th and 99th percentiles of the continuous regression variables across marginal tax rate and group affiliation status. MTR status is a dummy variable indicating 1 if the firm faces a positive marginal tax rate when earning one additional currency unit, and zero otherwise. Group membership

status is a dummy variable, equal to one if the firm is owned by a listed Belgian holding firm (*for a detailed description see Section 4*) and zero otherwise. Total Accruals captures accounting adjustments that distinguish a firm's economic income from the reported accounting income and are calculated as: $(\Delta Inventory + \Delta Debtors + \Delta Other Current Assets) - (\Delta Creditors + \Delta Other Current Liabilities) - Depreciation$. OCF is the firm-specific level of operating cash flow and is computed as (Earnings Before Extra-Ordinary Items) – Total Accruals. Both discretionary accruals and OCF are deflated by lagged total assets. Leverage and Total Assets are defined as above.

TABLE 4***Accruals – Cash Flow Regression Results Across MTR and Group Membership Status (Full Sample) ****

Dependent Variable: Total Accruals		Regression (4)		Regression (5)		Regression (6)	
<i>Intercept</i> _{<i>i,t</i>}		-0.028***	(-15.33)	-0.022***	(-11.04)	0.052***	(17.36)
<i>MTR</i> _{<i>i,t</i>}	(β_1)	0.069***	(34.57)	0.062***	(28.22)	0.060***	(29.06)
<i>OCF</i> _{<i>i,t</i>}	(β_2)	-0.881***	(-71.63)	-0.929***	(-58.49)	-0.943***	(-63.02)
<i>MTRxOCF</i> _{<i>i,t</i>}	(β_3)	0.066***	(4.87)	0.112***	(6.66)	0.073***	(4.57)
<i>Group</i> _{<i>i,t</i>}	(β_4)			-0.025***	(-5.27)	-0.029***	(-6.56)
<i>GroupxMTR</i> _{<i>i,t</i>}	(β_5)			0.067***	(11.04)	0.059***	(10.50)
(<i>GroupxOCF</i>) _{<i>i,t</i>}	(β_6)			0.103***	(4.14)	0.096***	(4.12)
(<i>GroupxMTRxOCF</i>) _{<i>i,t</i>}	(β_7)			-0.133***	(-4.40)	-0.089***	(-3.13)
Size	(β_8)					-0.022***	(-9.11)
Leverage	(β_9)					-0.084***	(-29.75)
Adjusted R ²		0.778		0.783		0.808	
F-statistic		9,289		4,096		3,709	
Sample size		7,936		7,936		7,936	

* This table presents coefficients (*t*-statistics) of OLS regressions of total accruals (TAs) on the firm's operating cash flow (*OCF*) level, differentiating for a firm's marginal tax rate (*MTR*) status [Regression (4)] and for a firm's *MTR* status and group membership [Regression (5)]. In Regression (6), we additionally control for a firm's size and leverage. Size is measured as the rank of total assets, standardized to the interval [0,1]. We interacted size and leverage with the variables of interest, leading to similar results. We do not report these results for reasons of brevity. The full model is defined below. Total Accruals are defined as: ($\Delta Inventory + \Delta Debtors + \Delta Other Current Assets$) – ($\Delta Creditors + \Delta Other Current Liabilities$) – *Depreciation*. *OCF* is the firm-specific level of operating cash flow and is computed as (Earnings before extra-ordinary Items) – Total Accruals. Both Total Accruals and *OCF* are deflated by lagged total assets. Variance Inflation Factors are never higher than 10 and suggest that multicollinearity is not an issue in interpreting these regressions. Results are displayed for all group and independent firm-level data over the period 1997-2001 ($N=7,936$). Further, *t*-statistics are White-corrected and significance levels are denoted by *** ($p<0.01$), ** ($p<0.05$) and * ($p<0.10$).

Model:

$$TACC_{it} = \alpha_0 + \beta_1 MTR + \beta_2 OCF + \beta_3 (MTR * OCF) + \beta_4 Group + \beta_5 (Group * MTR) + \beta_6 (Group * OCF)_{it} + \beta_7 (Group * MTR * OCF)_{it} + \varepsilon_{it}$$

TABLE 5
Descriptive Statistics and Regression Results on Intra-group Receivables as Tax-Minimizing Accruals Component *

Panel A: Descriptive Statistics											
Variable	N	Min.	p1	p10	p25	Median	p75	p90	p99	Max.	Mean
IG Receivables (% Total Assets)	605	0.000	0.000	0.000	0.000	0.027	0.135	0.339	0.859	0.987	0.108
IG Receivables (% Total Receivables)	605	0.000	0.000	0.000	0.000	0.119	0.575	0.906	1.000	1.000	0.296
Δ IG Receivables	605	-0.875	-0.398	-0.058	-0.006	0.000	0.024	0.113	0.489	0.946	0.016

Panel B: OLS regressions							
Dependent Variable:	Regression (7)			Regression (8)		Regression (9)	
<i>ΔIG Receivables</i>							
<i>Intercept_{i,t}</i>	(β_0)	0.024***	(4.45)	0.064***	(2.34)	0.022***	(1.07)
<i>OCF_{i,t}</i>	(β_1)	-0.126***	(-5.16)	-0.131***	(-3.37)	-0.224***	(-2.98)
<i>MTR_{i,t}</i>	(β_2)			0.044***	(3.75)	0.123***	(4.51)
<i>MTRxOCF_{i,t}</i>	(β_3)			-0.029	(-0.57)	-0.260**	(-2.32)
Adjusted R ²			0.041		0.055		0.184
Number of observations			605		605		201

* Panel A displays descriptive detailed statistics on intra-group receivables (IG Receivables), expressed as (i) a proportion of Total Assets and (ii) a proportion of Total Receivables and (iii) the year-on-year changes in these intra-group receivables. Belgian accounting law stipulates that group firms have to report these intra-group receivables in the accompanying notes of the financial statement (*Item 931*). Panel B reports coefficients (*t*-statistics) of OLS regressions of the changes in intra-group receivables on the firm's operating cash flow (*OCF*) level (Regression (7)), differentiating for a firm's marginal tax rate (*MTR*) status [Regression (8)] for all group firms. In Regression (9), we only include group firms in the OLS regression analyses if the proportion of intra-group receivables is above 5% of total assets. Unreported analyses (*available upon request*) show similar when adjusting this arbitrary cut-off point to 7.5%, 10%, 12.5% and 15%. All *t*-statistics are White-corrected and significance levels are denoted by *** ($p < 0.01$), ** ($p < 0.05$) and * ($p < 0.10$).