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Income Shifting under Losses

BY

Arnt O. Hopland, Petro Lisowsky, Mohammed Mardan AND **Dirk Schindler**

Norges Handelshøyskole

NORWEGIAN SCHOOL OF ECONOMICS

Income Shifting under Losses*

Arnt O. Hopland† Petro Lisowsky‡ Mohammed Mardan§
Dirk Schindler¶

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Abstract

This paper examines the flexibility of multinational firms to use income-shifting strategies within a tax year to react to operating losses. We develop a theoretical model that considers how affiliate losses can be adjusted ex post (i.e., after financial outcomes are revealed) or ex ante (i.e., before financial outcomes are revealed) by using transfer prices and internal debt. Our model predicts that under ex-post income shifting, loss affiliates have lower transfer prices and internal leverage than profitable affiliates, whereas under ex-ante income shifting, affiliates feature the same transfer prices and internal capital structure, regardless of making losses. Using data on direct transfer payments and internal debt of Norwegian affiliates, we find empirical evidence that, under losses, transfer pricing provides flexibility to adjust income shifting ex post, while we do not find evidence for flexibility in the use of internal debt to shift income ex post. Our study extends prior literature on income shifting that focuses largely on profitable firms and does not consider transfer pricing and internal debt shifting concurrently.

Keywords: income shifting, losses, debt shifting, transfer prices

JEL classification: F23, H25, H87

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†Norwegian School of Economics and Norwegian Center for Taxation (NoCeT); email: Arnt.Hopland@nhh.no

‡Corresponding author: University of Illinois at Urbana-Champaign and Norwegian Center for Taxation (NoCeT); 1206 S. Sixth St., MC-706, Champaign, IL 61820 USA; email: lisowsky@illinois.edu

§ETH Zürich and Norwegian Center for Taxation (NoCeT); e-mail: mardan@kof.ethz.ch

¶Norwegian School of Economics, Norwegian Center for Taxation (NoCeT) and CESifo; email: Dirk.Schindler@nhh.no

I. INTRODUCTION

In recent years, tax avoidance using income shifting between affiliates of multinational companies has become a hotly debated issue among policymakers and academics. In its "Base Erosion and Profit Shifting" (BEPS) report, the Organisation for Economic Co-operation and Development (OECD) (2013) confirms that profit shifting is a substantial issue and states that "at stake is the integrity of the corporate income tax"(p. 8). The OECD identifies transfer pricing and debt shifting as the two main strategies for shifting income from high-tax to low-tax countries. The use of both devices to reduce multinationals' overall tax payments is an important topic examined in the accounting, finance, and economics literatures.[1] However, policymakers and the academic literature have largely ignored income-shifting strategies in firms that incur losses.

Our paper contributes to this debate by considering income shifting under losses and analyzing the degree of flexibility in two income-shifting mechanisms: transfer pricing and internal debt. By doing so, we add to the literature on income shifting that rarely considers the effect of loss-making affiliates within a multinational firm. In particular, Klassen et al. (1993) discuss distinctive features of affiliates with net operating losses and point out that there is an incentive to shift income into such affiliates. However, the authors drop loss-making affiliates in their main sample, instead of testing for their characteristics.[2] Using IRS panel data on US companies from 1980 to 1987, Grubert et al. (1993) estimate that roughly 50% of the return-rate difference between foreign and domestically controlled firms is attributable to tax-induced transfer pricing. The authors point out that foreign-controlled firms not only disclose significantly less taxable income, but also consistently achieve profitability to be concentrated around zero, with significantly less deviations compared to domestic firms. This result is taken as indirect evidence supporting the presence of active income shifting, yet the role of losses in income shifting remains unclear.

Maydew (1997) examines inter-temporal loss shifting in U.S. firms after the 1986 Tax Reform Act reduced corporate tax rates substantially. He finds that expenses were shifted back to the higher U.S. tax rate regime, consistent with incentives to report higher losses if they can be settled immediately against highly taxed income. Erickson et al. (2013) find similar loss-shifting behavior over a longer period (1981-2010) during which

[1]For a general overview, see Gresik (2001), Shackelford and Shevlin (2001), Göx and Schiller (2007), Hanlon and Heitzman (2010), and Mintz and Weichenrieder (2010). Huizinga et al. (2008) and Møen et al. (2011) introduce external debt shifting. See Blouin et al. (2014) for a discussion of thin capitalization rules related to internal debt shifting.

[2]Dropping loss firms became the dominant empirical strategy in (almost) all papers on both transfer pricing and debt shifting in order to, seemingly, avoid any bias from reversed incentives under net operating losses. Some studies include loss-making firms in their robustness analysis, but the focus is still mainly on firms making profits without isolating the role of flexibility (e.g., Dharmapala and Riedel 2013). When we take into account that 38% of the observations for MNCs in our data run losses, it seems puzzling that loss-making affiliates receive so little attention.

firms accelerated loss recognition when their allowable carryback period was set to expire. However, the availability of loss carrybacks has been massively limited both in magnitude and in time (mostly to one year) in the last 15 years, especially in European countries. The reduction of opportunities to shift losses *inter*-temporally makes *intra*-temporal loss shifting important to identify and understand.

Only a very small literature directly examines intra-temporal income shifting in the presence of losses. Gramlich et al. (2004) and Onji and Vera (2010) analyze income-shifting behavior within domestic Japanese trusts ('keiretsus') and find evidence that net operating losses in some Japanese affiliates are balanced by shifting in income from other Japanese affiliates. Onji and Vera credit this behavior to tax motives that arise from the fact that the Japanese corporate income tax did not provide group provision in order to consolidate keiretsus' overall taxable income. De Simone et al. (2015) examine whether the unexplained income of loss affiliates is correlated with tax-related factors. They find that both the potential tax savings and ability of profitable affiliates to contribute profits to loss affiliates affect unexplained profits (losses). However, these studies do not consider and compare the flexibility and effect of losses on internal debt shifting or transfer pricing strategies concurrently, including the role of intangible assets. In addition, they neither identify the mechanisms for intra-temporal income shifting, nor analyze firms' ability to react to new information about profit or loss realization.

Importantly, our study examines the flexibility of multinational firms to use income-shifting strategies – whether using transfer pricing or internal debt – within a tax year to react to operating losses. We define flexibility as the ability for a firm to adjust its income-shifting strategies after new information on financial performance outcomes is revealed within a tax year. We refer to this activity as flexibility to shift ex post. Lack of flexibility, i.e., that firms must commit to their income-shifting strategies before having information about their financial performance, is referred to as ex-ante income shifting.

We begin by setting up a model of a multinational company that owns affiliates in n countries and hosts a profit and financial center in a tax haven. The tax-haven affiliate uses its equity to lend internal debt to the other related affiliates. It charges them user fees for a fixed factor (e.g., royalties on technology) and serves as a vendor, buying an intermediate good at the world market price and reselling it with a mark-up to the productive affiliates (e.g., the Apple Sales International case, see Levin and McCain 2013). Thus, our model captures income shifting by transfer pricing both in intangibles and intermediate tangible goods, as well as internal debt shifting. Shocks to the sale price of the final good introduce the risk of incurring net operating losses at the end of the tax year.

The theoretical model suggests that flexibility in income-shifting strategies has crucial implications for firm behavior in achieving tax-efficient income reporting under losses. If firms have little flexibility, they are forced to adjust their income-shifting strategies ex ante, i.e., at the beginning of the year. For that purpose, they must consider the likelihood

of incurring losses by the end of the year before financial outcomes are observed. However, if firms have (some) flexibility, they can adjust their income-shifting strategies ex post, i.e., they can wait to observe financial outcomes before considering whether and how much income to shift between affiliates. One important insight from this model is that the standard procedure of dropping loss-making affiliates in empirical studies only works well if there is substantial flexibility in income shifting. If an income-shifting strategy features inflexibility, the procedure of dropping loss-making affiliates will not cure the estimation bias. Ignoring loss expectations when firms are inflexible will lead to an underestimation of the true effect even if the sample only includes profitable firms. This occurs because, ex ante, all firms face the same trade-off by taking into account loss expectations and hence this is also true for ex-post profitable firms.

We empirically explore flexibility in income shifting using a firm-level panel data set of all Norwegian based firms' tax returns during 1998-2005. The key advantage of the Norwegian data is that we can directly observe incoming and outgoing transfer payments between affiliates, as well as measure internal leverage ratios by affiliate, over time.[3] We separately regress intra-firm transfer payments and internal leverage ratios on an indicator variable equal to one if the firm experiences a loss position in that year, and control for a variety of other factors that may explain income shifting, including past profitability as a proxy for ex-ante expectations. If being in a loss position significantly reduces affiliates' net outgoing transfer payments and internal leverage in the current year, then we infer that at least some flexibility exists to shift income ex post.

The empirical results indicate that multinational firms exert flexibility in adjusting their transfer pricing ex post, i.e., after receiving information on financial performance, but before the end of the year. In particular, we find that, compared to profitable affiliates, loss affiliates make smaller outgoing transfer payments to other affiliates within the multinational company.[4] Further analysis indicates that firms have more flexibility to adjust transfer prices for intangible than for tangible goods. In addition, we find evidence consistent with changes in transfer prices, rather than underlying firm performance or weak customer demand, explaining the smaller net outgoing transfer payments of loss firms.

On the contrary, we do not find evidence for flexibility in the use of internal debt. However, since the estimates are imprecise, we cannot definitively rule out that some ex-post shifting in internal debt takes place. We also note that since smaller outgoing transfer payments and lower internal leverage reduce the risk of experiencing a loss, our

[3]Prior research largely identifies income shifting indirectly by regressing the foreign affiliate profitability on differences in the parent and foreign tax rates (e.g., across foreign and domestic jurisdictions). Important exceptions are, e.g., Clausing (2003), Bernard et al. (2006), and Davies et al. (2014).

[4]Consistent with findings in Dischinger et al. (2014), we find that there are important differences between multinationals' affiliates, controlled from abroad, and (Norwegian) parent companies. We point out that flexibility is more important for the subsidiary, or daughter, companies.

estimates may suffer from an attenuation bias. Therefore, it is still possible that firms have some flexibility to also adjust internal leverage ex post. Nevertheless, our results suggest flexibility occurs mostly in transfer prices rather than internal debt.

Our findings are in line with the intuition that it is easier to shift income by mispricing intra-firm trade than relying on thin capitalization (and potentially low interest rates) for reducing the tax burden. Furthermore, our results are consistent with transfer pricing generating lower concealment costs because it is more difficult to enforce the arm's-length principle for transfer prices than to enforce effective thin-capitalization rules (see Blouin et al. 2014 and De Simone 2015).

Our findings have policy implications for governments in high-tax countries that are concerned about an erosion of their tax base by income shifting in multinational firms (OECD 2013). Our results suggest that tax authorities should not only focus on transactions between profitable affiliates in high-tax countries and related parties in low-tax countries, but should also scrutinize payments made to loss-making affiliates in other high-tax countries. This is particularly true for firms that are flexible in using their income-shifting strategies, i.e., firms with large intra-firm transfer payments, especially for intangible goods. Our findings do not rule out, however, that less flexible firms could be just as tax-aggressive even though they sometimes report profits and losses. By anticipating ex ante the likelihood of incurring losses, they can still shift substantial income and it would be imprudent just to focus tax audits on firms whose income is concentrated around zero. This cautionary note matters in particular for firms with low transfer-pricing possibilities, but large amounts of financial capital, that anticipate incurring losses in the future.

The paper proceeds as follows. The theoretical model is developed in Section II. The data is presented in Section III while Section IV discusses the empirical strategy and results. Section V offers some concluding remarks.

II. THEORETICAL MODEL

The Setting

Consider a multinational company (henceforth MNC) that has affiliates in n countries. Let country 1 be the country with the lowest tax rate so that $t_i > t_1, i = 2, ..., n$ and label country 1 as the 'tax haven'.[5] As a simplification, we assume that the affiliate in the tax haven acts exclusively as a financial and profit center of the MNC and therefore does not produce any goods.[6] All other affiliates use capital K_i and an intermediate

[5]All countries $i > 1$ will be referred to as 'non-haven countries'. Because $t_i > t_1, i > 1$, any country $i > 1$ will optimally shift towards the tax haven only; hence, there is no need to differentiate between high-tax and low-tax countries.

[6]We use the terms 'financial center' and 'profit center' interchangeably. The reason is that the literature on transfer pricing often refers to a profit center as the lowest-tax affiliate, which receives shifted

good S_i to produce a homogenous final good y_i according to the production technology $y = F(K_i, S_i; \bar{X})$, which is concave in both inputs. The price p_i of the final good is stochastic and drawn from a cumulative distribution function $H(p)$ with a lower level of $\underline{p}$ and an upper threshold of $\bar{p}$. $\bar{X}$ represents a fixed factor that we interpret as acquired technological know-how (e.g., resulting from R&D investment within the MNC group).

The profit center purchases $\sum_i S_i$ units of a tangible, intermediate good S at marginal costs of q_S on the world market and re-sells them at price $G_i^S + q_S$ to the other affiliates, pretending that it has added value G_i^S to the input good. The correct arm's-length price of S, however, is q_S. Furthermore, the patent rights for the intangible, technological know-how $\bar{X}$ are also located in the profit center which claims license fees $G_i^X + q_X$, while the true arm's-length price is q_X. Any deviation from the true arm's-length price leads to convex concealment costs $C^P(P_i^X, P_i^S)$, where $P_i^X = G_i^X \cdot X$ and $P_i^S = G_i^S \cdot S_i$, with $\frac{\partial C^P}{\partial G_i^a} > (<)0$ if $G_i^a > (<)0$ and $\frac{\partial^2 C^P}{\partial (G_i^a)^2} > 0, a = \{X, S\}$. The concealment costs are defined over shifted income and correspond to the set-up in Allingham and Sandmo (1972), where a fine is calculated based on undeclared income. This concept of concealment costs in transfer pricing mirrors the 'comparable profit method' proposed by the OECD.[7]

The headquarters (henceforth HQ) of the MNC endows the financial center with equity E_1 and provides the producing affiliates with the equity necessary to reach both a tax-efficient financing structure and the optimal level of real capital.[8] Thus, productive capital K_i in affiliate i is financed by equity E_i provided by the HQ and by internal debt D_i^I borrowed from the financial center so that $K_i = E_i + D_i^I$.[9] The financial center uses its equity E_1 to finance its internal lending $\sum_i D_i^I$ to all the other affiliates so that $E_1 = \sum_i D_i^I$. We define the internal leverage ratio of the producing affiliate as $b_i = D_i^I / K_i$ and assume that both types of financing are free of risk and carry the world-market interest rate r.

In line with most tax systems, we assume that the costs of equity are not tax deductible while interest expense related to debt can be deducted from the corporate tax base. As is

income from mispriced intra-firm trade, while the debt-shifting literature often labels a financial center as the internal bank, which lends funds to and receives interest income from related affiliates. In our setting, the result is the same in that a profit/financial center can be used to shift income within the MNC.

[7]The alternative approach would be to rely on the deviation of the true arm's-length price only, featuring the 'comparable unrelated price method' (see OECD 2013, and Gresik and Osmundsen 2008, for institutional details). Qualitatively, our results do not depend on which approach is chosen.

[8]We assume central decision-making because allowing for decentralization would add complexity without providing additional insights on the tax incentives. Moreover, firms can rely on two books and multiple transfer prices in order to separate tax-driven income shifting from principal-agent problems in a decentralized structure (see Smith 2002; Nielsen and Raimondos-Møller 2012). Finally, Nielsen et al. (2008) argue that centralization is the dominant strategy when tax differentials are large and tax savings are important. Göx and Schiller (2007, p. 692) survey mixed empirical evidence, but anecdotal evidence suggests that large, tax efficient MNCs operate with multiple transfer prices. See, e.g., Daniel Kocieniewski on 'G.E.'s Strategies Let It Avoid Taxes Altogether' in The New York Times of March 24, 2011.

[9]For simplicity and without any consequences for our main results, we have assumed that there are no external capital markets for debt available.

standard in the literature (e.g., Mintz and Smart 2004; Schindler and Schjelderup 2012), the MNC needs to incur concealment costs $C^I(b_i)$ in order to conceal thin capitalization. These costs are proportional to the amount of capital employed and convex for any positive internal leverage $b_i > 0$, but zero otherwise, both in absolute terms and on the margin (i.e., $C^I(b_i) = \frac{\partial C^I(b_i)}{\partial b_i} = 0$ for $b_i \leq 0$).

Given these assumptions, the economic profit of affiliate i is given by revenue from the sales of the output good minus the license cost for the intangible good, the input cost for the tangible intermediate good, the concealment costs related to tangible and intangible goods due to deviations from the arm's length standard, concealment costs related to internal leverage (e.g., due the thin-capitalization rules), and the user cost of capital

$$\pi_i^e = p_i y_i - (G_i^X + q_X)\bar{X} - (G_i^S + q_S)S_i - C^P(P_i^X, P_i^S) - C^I(b_i)K_i - rK_i. \tag{1}$$

Taxable income differs from economic profit in that opportunity costs of equity and concealment costs are not tax-deductible. Furthermore, we assume that no loss offset is granted when the affiliate is running taxable losses.[10] Let p_i^0 be the price for which the taxable income of affiliate i is just zero. The taxable income of affiliate i can then be written as

$$\pi_i^t = \begin{cases} p_i y_i - (G_i^X + q_X)\bar{X} - (G_i^S + q_S)S_i - rb_i K_i, & \text{if } p_i > p_i^0 \\ 0, & \text{if } p \leq p_i^0. \end{cases}$$

The (after-tax) surplus of the financial center in country 1 amounts to the receipt from each non-haven affiliate of license fees, payments for goods, and interest income, less the development cost of intangibles and input costs of tangibles, as well as the financial center's aggregate cost of capital,[11]

[10] In reality, loss carry forwards allow for deducting current losses against future profits. However, loss carry forwards are not inflated with interest and their present discounted value decreases over time. Therefore, in a fully specified model, one would need to compare the discounted tax rate in the future to the net tax savings from settling losses in one affiliate with taxable profits in other affiliates in the current year. As our empirical analysis later in the study focuses on Norway in the years 1998 to 2005, the simplifying assumption of no loss carry forwards should be harmless because the average Norwegian interest rate on banks' overnight loans was 7% in this period. Furthermore, before 2005, the time limit to utilize loss carry forwards was 10 years in Norway and as short as 5 years in other major OECD countries (see OECD 2002, Table 2.2). Indeed, there is (indirect) evidence that Norwegian firms were concerned about the expiration of their loss carry forwards (see Aarbu and MacKie-Mason 2003), which further suggests that our simplifying assumption is reflective of economic conditions in Norway.

[11] In this model, all income is shifted to the financial center. Then, this center uses part of its surplus to shift income to loss affiliates in non-haven countries.

$$\begin{aligned}\pi_1 &= (1-t_1)\sum_i[(G_i^X+q_X)\bar{X}+(G_i^S+q_S)S_i+rb_iK_i-q_X\bar{X}-q_SS_i]-r\sum_i b_iK_i \\ &= (1-t_1)\sum_i\left[G_i^X\bar{X}+G_i^SS_i\right]-t_1r\sum_i b_iK_i. \qquad (2)\end{aligned}$$

The HQ of the MNC maximizes total after-tax income Π by choosing the optimal income-shifting activity, i.e., by optimizing over internal leverages b_i, and the transfer prices G_i^X and G_i^S. With respect to the timing of the tax-planning strategies of the MNC, two scenarios are applicable. First, the MNC could choose its tax-planning strategies after the realization of the output price, say, at the end of the year. We refer to this scenario as 'ex-post income shifting.' Second, it could be that the MNC has to decide on and to commit to its income-shifting activities before the revelation of the output prices. We refer to this setting as 'ex-ante income shifting'.

Ex-post Income Shifting

Taking information during the year about the output price into account, the MNC shifts income to those affiliates granting the largest tax reductions. We can distinguish the two cases $p_i > p_i^0$ (generating positive taxable income in affiliate i) and $p_i \leq p_i^0$ (generating zero income or losses in affiliate i). Therefore, we introduce an indicator function $\mathbb{1}_i$ that equals one if an affiliate reports a positive tax base ($\pi_i^t > 0$) and is zero whenever an affiliate has non-positive taxable profits ($\pi^t \leq 0$).

The overall after-tax income Π of the MNC consists of the after-tax income in the profit center π_1 plus the sum over the productive affiliates' after-tax incomes $\sum_{i>1}(\pi_i^e - \mathbb{1}_i t_i \pi_i^t)$. The tax payments $t_i\pi_i^t$ are always positive for profitable affiliates with $\pi_i^t > 0$, and zero for all affiliates reporting non-positive taxable profits $\pi_i^t \leq 0$. Hence, the maximization problem of the MNC can be written as

$$\begin{aligned}\max_{b_i,G_i^X,G_i^S}\Pi &= \pi_1+\sum_{i>1}(\pi_i^e-\mathbb{1}_it_i\pi_i^t) \quad \text{s.t.} \quad \mathbb{1}_i=\begin{cases}1, & \text{if } \pi_i^t>0,\\ 0, & \text{if } \pi_i^t\leq 0,\end{cases} \qquad (3)\\ &\quad \sum_i rb_iK_i=0, \quad \sum_i G_i^X\bar{X}=0, \quad \sum_i G_i^SS_i=0.\end{aligned}$$

Positive taxable income. In the first case, $\mathbb{1}_i = 1$ because these producing affiliates earn taxable profits and therefore face the local tax rate t_i. Differentiating the total after-tax income (3) for the three income-shifting variables under the condition $\pi_i^t > 0$ yields

$$t_i - t_1 - \frac{1}{r}\frac{\partial C^I}{\partial b_i} = 0, \tag{4a}$$

$$t_i - t_1 - \frac{\partial C^P}{\partial P_i^X} = 0, \tag{4b}$$

$$t_i - t_1 - \frac{\partial C^P}{\partial P_i^S} = 0. \tag{4c}$$

The rearranged first-order conditions state that the effective marginal concealment costs for each income-shifting device equalize in the optimum, i.e. $\frac{1}{r}\frac{\partial C^I}{\partial b_i} = \frac{\partial C^P}{\partial G_i^X} = \frac{\partial C^P}{\partial G_i^S}$. Furthermore, if the taxable income in the producing affiliates is positive, the MNC is unconstrained in the use of all income-shifting channels and effective marginal concealment costs are equal to the marginal tax savings $t_i - t_1$. The consequences are that, for affiliates with taxable profits, the MNC sets transfer prices above the correct arm's-length prices, and that the financial center lends internal debt to the non-haven affiliates in order to shift income into the tax haven.

Non-positive taxable income. Whenever the output price is equal to or below the break-even price ($p_i \leq p_i^0$), the producing affiliates have neither economic profits nor taxable income, i.e., they are in a loss position. Therefore, $\mathbb{1}_i = 0$ and tax payments drop to zero. Such affiliates will not earn any tax savings on income shifted out.

For such cases, the first-order conditions yield

$$\frac{\partial \Pi}{\partial b_i} = -t_1 - \frac{1}{r}\frac{\partial C^I}{\partial b_i} < 0, \tag{5a}$$

$$\frac{\partial \Pi}{\partial G_i^X} = -t_1 - \frac{\partial C^P}{\partial P_i^X} = 0, \tag{5b}$$

$$\frac{\partial \Pi}{\partial G_i^S} = -t_1 - \frac{\partial C^P}{\partial P_i^S} = 0. \tag{5c}$$

From condition (5a) follows that the internal debt tax shield in affiliates with $\pi_i^t < 0$ becomes negative and optimal internal debt is zero.[12] In fact, the MNC even has an incentive to use such non-haven affiliates as internal bank as long as these affiliates are in a loss position and their marginal tax rate is zero. We will, however, assume that the MNC cannot reallocate its equity.[13]

Turning to transfer pricing, the first-order conditions (5b) and (5c) state once more that the marginal concealment costs for each transfer-pricing device are equalized in the

[12] Remember that $\frac{\partial C^I(b_i)}{\partial b_i} = 0$ for $b_i \leq 0$.

[13] Note that the total interest expense and income over the entire tax year matter for global tax savings. Relocating the financial center at the end of a tax year will not generate substantial tax-free interest income there, so that inverting the financial structure (i.e., changing the financial center) at year's end will not deliver any reward.

optimum. In the case of losses ($\pi_i^t < 0$), the effective marginal concealment costs equal the marginal loss $-t_1$ from shifting out income. Accordingly, the MNC has an incentive to reduce the transfer prices for the intermediate good and license fee below the correct arm's-length price.[14]

In sum, the tax shield in affiliates that report losses on their tax return becomes negative, because there are no tax savings anymore, but potential tax payments on shifted income in the tax haven. Thus, the MNC shifts income into those non-haven countries hosting such loss affiliates. Consequently, the incentives for income shifting are completely reversed in a loss position compared to a profit position.

Tax-efficient capital structure. The mechanism at play under debt shifting is that interest income is earned in the low-tax (haven) country and deducted in higher-tax (non-haven) countries, so that the tax savings arising from the deductions in non-haven countries exceed the corresponding tax payments in the haven country.

Following the literature (e.g., Huizinga et al. 2008, Møen et al. 2011), we assume the concealment costs to be quadratic in internal leverage, i.e.,

$$C^I(b_i) = \frac{\eta_b}{2} \cdot (b_i)^2 \,. \tag{6}$$

η_b represents a constant cost parameter of debt shifting. Applying equation (6) in the first-order condition (4a), we find as optimal internal leverage in the case of a profitable producing affiliate

$$b_i^* = (t_i - t_1)\frac{r}{\eta_b} > 0. \tag{7}$$

All affiliates $i > 1$ will borrow from the financial center and, due to improved possibilities to save taxes, the internal leverage is increasing in the internal tax debt shield, i.e.,

$$\frac{\partial b_i}{\partial t_i} = \frac{r}{\eta_b} > 0 \quad \text{and} \quad \frac{\partial b_i}{\partial t_1} = -\frac{r}{\eta_b} < 0.$$

If taxable income is negative, the affiliate experiences a negative debt tax shield ($-t_1 r$) and the optimal internal leverage is zero in affiliates that are in a loss position $\pi_i^t < 0$.

Optimal transfer pricing. As in debt shifting, the literature on transfer pricing suggests quadratic concealment costs (e.g., Haufler and Schjelderup 2000; Grubert 2003; Randolph et al. 2005; Nielsen et al. 2010). Since the MNC in our model has two devices for shifting income by transfer pricing, G_i^X and G_i^S, it is reasonable to consider the two as cost substitutes, i.e., the two devices are mutually increasing each others' concealment

[14] Implicitly, we assume that there are no concealment costs related to shifting income out of a tax haven, because the tax haven does not monitor financial flows.

costs. We define the concealment cost function of income shifting as

$$C^P(P_i^X, P_i^S) = \frac{1}{2}\left[\frac{\eta_X}{2}\left(P_i^X\right)^2 + \frac{\eta_S}{2}\left(P_i^S\right)^2\right]^2, \tag{8}$$

where η_x and η_S represent constant cost parameters of transfer pricing.

Using (8) as the cost function leads to the following optimal (abusive) transfer prices for the intangible good's license fee and the tangible intermediate good[15]

$$\left(G_i^X\right)^* = \sqrt[3]{\frac{\eta_S}{\eta_S+\eta_X}\cdot\frac{2}{(\eta_X)^2}\cdot(\mathbb{1}_i t_i - t_1)}\,\frac{1}{\bar{X}}, \quad \mathbb{1}_i = \begin{cases} 1, & \text{if } \pi_i^t > 0 \\ 0, & \text{if } \pi_i^t \leq 0. \end{cases} \tag{9a}$$

$$\left(G_i^S\right)^* = \sqrt[3]{\frac{\eta_X}{\eta_S+\eta_X}\cdot\frac{2}{(\eta_S)^2}\cdot(\mathbb{1}_i t_i - t_1)}\,\frac{1}{S_i}, \quad \mathbb{1}_i = \begin{cases} 1, & \text{if } \pi_i^t > 0 \\ 0, & \text{if } \pi_i^t \leq 0. \end{cases} \tag{9b}$$

Not surprisingly, the surcharges on the correct arm's-length prices are positive in case of a profitable affiliate ($G_i^X, G_i^S > 0$). In this case, the mark-ups increase with the tax rate of the producing affiliates t_i, but decrease with the tax rate t_1 of the profit center

$$\frac{\partial G^a}{\partial t_i} > 0 \quad \text{and} \quad \frac{\partial G^a}{\partial t_1} < 0, \quad a = X, S.$$

A higher tax differential makes abusive transfer pricing more attractive, because shifting income will result in higher tax savings.

In contrast, the MNC sets transfer prices that lie below the correct arm's-length price if the affiliate is in a loss position ($G_i^X, G_i^S < 0$). This is because the effective marginal tax rate is zero, regardless of t_i. Consequently, income-shifting incentives are reversed as long as the producing affiliates have non-positive taxable income (i.e., zero tax payments). In this case, the tax rate t_i does not affect the magnitude of the transfer prices. Contrary to before, now an increase of the tax rate t_1 in the profit center leads to a further deviation from the correct arm's-length price and to more income shifted to the producing affiliates. The reason is that the tax disadvantage of the tax haven increases relative to the effectively zero tax burden in the non-haven countries.

Hence, affiliates of MNCs concentrate taxable income around zero. For profitable affiliates, the HQ has an incentive to shift income into the haven country, whereas affiliates with taxable losses will receive income from affiliates abroad (the financial center).

Ex-ante Income Shifting

If the MNC must decide ex ante on transfer prices as well as the level of internal debt, it cannot revisit these decisions after the output prices are revealed. Thus, the MNC's HQ

[15] See Appendix A.1 for complete derivations.

maximizes the *expected* overall income.

Expected income of a non-haven affiliate is

$$\begin{aligned} E(\pi_i) &= \int_{\underline{p}}^{\bar{p}} p_i h(p)\, dp \cdot y_i - (G_i^X + q_X)\bar{X} - (G_i^S + q_S)S_i - rK_i \\ &- t_i \int_{p_i^0}^{\bar{p}} p_i h(p)\, dp \cdot y_i + [1 - H(p_i^0)] \cdot t_i[(G_i^X + q_X)\bar{X} + (G_i^S + q_S)S_i + rb_iK_i] \\ &- C^P(P_i^X, P_i^S) - C^I(b_i)K_i. \end{aligned} \tag{10}$$

The first line displays affiliates' economic profits; the size of the economic profits depends on the realization of p_i which is ex ante uncertain. The second line recognizes that affiliates have to pay taxes in the case of a sufficiently high output price. This happens only with the likelihood $[1 - H(p_i^0)]$, i.e., the probability that the affiliate makes a profit. In any other case, tax payments in country i are zero. The third line shows that the MNC also incurs concealment costs for debt shifting and transfer-price manipulation.

Accordingly, overall expected income of the MNC can be written as

$$E(\Pi) = \sum_{i>1} E(\pi_i) + (1 - t_1) \sum_i \left(G_i^X \bar{X} + G_i^S S_i\right) - t_1 r \sum_i b_i K_i. \tag{11}$$

Differentiating the expected after-tax income of the MNC for the three tax-avoidance variables, taking into consideration that the price p_i^0 is affected by changes in the transfer prices and internal debt, gives[16]

$$[1 - H(p_i^0)]t_i - t_1 = \frac{1}{r}\frac{\partial C^P}{\partial b_i}, \tag{12a}$$

$$[1 - H(p_i^0)]t_i - t_1 = \frac{\partial C^P}{\partial P_i^X}, \tag{12b}$$

$$[1 - H(p_i^0)]t_i - t_1 = \frac{\partial C^P}{\partial P_i^S}. \tag{12c}$$

With uncertainty in the realization of the output price, the risk neutral MNC is more cautious in setting transfer prices and allocating internal loans. The MNC only wants to shift income to the financial center if the producing affiliate has taxable income. Therefore, it is the *expected* tax rate (as opposed to the statutory tax rate) of the producing affiliate, $[1-H(p_i^0)]\, t_i$, that matters for determining the tax savings ex ante. Consequently, overinvoicing transfer prices and internal debt shifting becomes less attractive if the probability of being unprofitable, $H(p_i^0)$, increases.

In the setting of ex-ante income shifting, this insight leads to precautionary behavior and self-insurance that can be two-fold. In order to self-insure against a low price and

[16] We deliver a full derivation of the ex-ante optimality conditions in Appendix A.2.

potential losses, firms can 'underinvest' in transfer pricing and internal leverage, which will reduce exposure to the risk of ending up with losses that are not currently tax deductible. In addition, firms being at risk of running losses can choose instruments that allow for more flexibility during the tax year.

Empirical Predictions from the Model

The main inferences from the theoretical model can be summarized in two main points. First, the model predicts that taxable income from MNCs should concentrate around zero since they have incentives to shift profits out of profit-making affiliates and in to loss-making affiliates. This intuition is consistent with the observations in Grubert et al. (1993). In the next section, we evaluate whether concentration around zero takes place in our data by comparing the profits in MNCs to profits in domestic companies.

Second, the theoretical model highlights the importance of flexibility in income-shifting strategies. If MNCs have full flexibility to decide on income shifting after realizing the outcome price (ex post), loss-making affiliates will receive net transfers and bear no internal leverage. In the other extreme, where all decisions must be made before the outcome price is known (ex ante), income shifting will not be a function of whether the affiliate ends up in a loss position. If there is some, but not full flexibility, we should observe that net outgoing transfers and internal leverage are reduced when affiliates incur losses, albeit not to the same extent as in the full flexibility case.

For the purpose of our empirical analysis, the ex-ante situation is a useful benchmark as a null hypothesis, since it suggests that there should be no effect from the loss position status on income-shifting strategies. If we can reject this null and find a significantly negative relation between losses and (1) net transfers and/or (2) internal leverage ratios, our results would imply that MNCs have at least some flexibility in making income-shifting decisions ex post.

III. DATA

Our sample is constructed by combining three unique data sources. First, Dun&Bradstreet provides data on financial statistics for all companies registered in Norway. Second, SIFON supplies information on foreign ownership of Norwegian firms. Third, the Norwegian Tax Authorities (Skattedirektoratet) and Statistics Norway provide direct data on transactions and debt relationships between Norwegian firms and their foreign affiliates (Utenlandsoppgaven). These three data sources are merged, using an identification key that identifies each Norwegian firm uniquely.

Although we do not observe the actual transfer prices, we do observe the direct transfer payments made ('outgoing') and received ('incoming') between each firm's affiliates in several categories. Thus, transfer payments are a proxy for the transfer prices predicted

in our theory model.[17] For example, outgoing transfers include payments for intangible goods (e.g., royalties, license fees, and rental expenditures), and for tangible intermediate goods (e.g., purchases) that the Norwegian firm makes to a foreign affiliate.[18] We also observe the capital structure of each affiliate. This feature allows us to measure internal debt shifting. We classify a Norwegian-based firm as a MNC if it either controls at least one daughter company abroad or is controlled by a foreign owner. That is, the Norwegian firm is a MNC if it either owns, directly or indirectly, at least 50% of a foreign affiliate, or a foreign owner controls at least 50% of the shares of the Norwegian firm.[19]

Our panel data set covers the eight-year period from 1998 to 2005, and it includes all firms except financial firms and producers of oil and gas, which are subject to special laws and regulations, including restrictions on prices.[20] Because the variation in each firm's loss/profit positions over time is limited, we try to preserve as much of the original data as possible. We only exclude very few observations with extreme values, notably negative sales and negative total assets. Finally, the measures for transfer payments are winsorized at the 1st and 99th percentiles, while we restrict the total internal leverage to the interval $[0; 1]$.[21]

In Figure 1, we start by examining the distribution of ROA, or income before taxes scaled by total assets, of both MNCs (solid bars) and purely domestic firms (striped bars). We report the proportion of MNCs and domestic firms that report ROA within intervals of 5%, focusing on firms within ROA of -50% to +50%. The data support our prediction that the income of MNCs more frequently concentrates around zero than the income of purely domestic firms. In particular, 21% of MNCs report income that is just slightly above zero, or 0 to $<$ 5% of ROA, while only 17% of domestic firms fall in the same interval of ROA. Overall, the central tendency in the ROA distribution for MNCs is more pronounced around zero than for domestic firms. These results are consistent with our first empirical prediction that MNCs have greater incentives to shift income out of profit-making affiliates and in to loss-making affiliates.

[17] Robustness checks in Section IV yield results consistent with this assumption.

[18] We use the term 'outgoing' in reference to the Norwegian entity.

[19] We focus on the Norwegian setting because all other available (European) databases do not provide the necessary information for our empirical analysis. For example, the Amadeus dataset by Bureau van Dijk does not contain information on internal debt and transfer payments. The MiDi database of German Bundesbank reports capital structures in foreign affiliates, but neither provides profit/loss statements nor any information on intra-firm trade (i.e., transfer payments). An alternative would be U.S. data on intra-firm transfers from the U.S. Bureau of Economic Analysis that contains similar information as the Norwegian data (for selected years). However, these data are proprietary and unavailable to the authors.

[20] The length of the sample period is limited by the fact that detailed data on transactions are not collected by the Norwegian tax authority or Statistics Norway for later years. We also note that the observations used in our sample can be applied directly to our theory model because Norway does not allow loss carry backs and introduced thin-capitalization rules in 2014, restricting the use of internal debt.

[21] 39 and 6 observations, respectively, are deleted from the sample of MNCs due to negative sales and negative total assets. 303 observations with an internal leverage outside the interval $[0; 1]$ are excluded from the analysis of internal debt, but are retained in the tests of transfer payments. The continuous control variables pre-tax income, total assets, and loss carry forward are also winsorized.

[Insert Figure 1 about here]

In order to test for flexibility in cross-border income shifting under losses, we now examine only MNCs. We generate a dummy variable (L_{it}) equal to 1 if the Norwegian firm i is in a loss position in year t; zero otherwise. As we explain later, this measure will be our independent variable of interest. In terms of dependent variables, we first calculate net outgoing transfer payments as outgoing transfers minus incoming transfers (using the Norwegian firm as the reference point for incoming or outgoing), where transfer payments include the sum of royalties, licenses, rent, and purchases. We scale transfer payments by the mean total assets of the Norwegian affiliate over the sample period. Second, we calculate the internal leverage ratio as affiliate (short- and long-term) debt, scaled by mean total affiliate assets over the sample period. Using the mean total assets in the denominator ensures that any changes in transfer payments or internal leverage are caused by changes in income shifting rather than assets.

[Insert Table 1 about here]

Table 1 takes an initial descriptive look at the relation between being in a loss position and income-shifting strategies (i.e., via transfer pricing or internal debt). When evaluating the full sample of MNCs, we observe no significant differences between firms with profits and losses. However, Dischinger et al. (2014a,b) offer a plausible explanation in that they find the income distribution is skewed in favor of the HQ's location and that there is less income shifted away from high-tax parent companies compared to affiliates with the same tax rate. This indicates that the HQ plays a unique role in MNCs, or to quote the title of their 2014a-paper, "There is no place like home". This is in line with theoretical studies pointing to agency costs and moral-hazard problems between the HQ and the profit/financial center.[22] Hence, we also look at the sub-sample of MNCs that are controlled by foreign owners, i.e., at Norwegian daughter companies only.[23] For this sub-sample, we obtain the expected negative sign, and the difference is statistically significant. Due to the difference in behaviors between headquarter and daughter entities, we report separate results for the full sample and sub-sample consisting of only Norwegian daughter companies of foreign parents.

The difference between the full sample of MNCs and the sub-sample of Norwegian daughters is less visible when examining internal leverage. In both cases, firms in a loss

[22] Also see O'Donnell (2000), Chang and Taylor (1999), and Hamilton and Kashlak (1999).

[23] The data source containing transfers and internal leverage aims to capture Norwegian companies with ownership abroad, and thus mainly contain Norwegian mother companies. Of the Norwegian companies with ownership abroad, about 15% are again owned by a foreign mother company. Hence, our data contain information about a relatively low number of Norwegian daughter companies.

position hold less debt than those in a break-even or profit position. In fact, this difference is larger for the sub-sample of daughters. Overall, the descriptive results suggest that there is flexibility in both devices – transfer payments and internal leverage – for income-shifting. However, it would be premature to draw any conclusions before employing multivariate regression tests.

In particular, the first concern our regression tests address is the potential for auto-correlation in performance. If losses in previous years predict the probability of running losses in the current year, firms can adjust their strategies based not only on present, but also past performance. Failing to control for such dynamics will give rise to an omitted variables bias. We report the autocorrelation of losses in Table 2. It is evident that being in a loss position in one year is a strong predictor of performance in the next two years, which indicates that managers can form some expectations of future profitability ex ante. We take this relation into account when specifying the empirical model.

[Insert Table 2 about here]

IV. EMPIRICAL ANALYSIS

Empirical Strategy

Our empirical investigation relies on OLS estimations of variations of the following equation:

$$y_{ijt} = \beta_0 + \beta_1 L_{ijt} + \beta_2 L_{ijt-1} + \beta_3 L_{ijt} * L_{ijt-1} + \boldsymbol{z_{ijt}^{'}\theta} + \delta_t + \alpha_j + \epsilon_{ijt}, \tag{13}$$

where the dependent variable y_{ijt} is either transfer payments or internal leverage in affiliate i, being active in industry j at year t. In the main specifications, we successively use gross and net outgoing transfers, as well as total internal leverage. We use variations of these variables in robustness checks, reported later.

Our key independent variable is L_{ijt}, or the loss-position indicator, making β_1 the coefficient of interest in our study. Under the null of zero flexibility, β_1 is zero while a significantly negative estimate suggests flexibility to perform ex-post shifting.

As discussed above, the substantial autocorrelation in losses means that earlier years' performance is an important control for the expectations on performance in year t. Moreover, this expectation can have a direct impact on how a firm reacts to losses in year t. Hence, in the regressions we include the lagged loss position, as well as an interaction term between the current and lagged loss position that is equal to one if a firm experienced a loss position both at time t and $t-1$. The interaction term captures the use of ex-ante strategies that allow for some flexibility during the tax year (see the discussion of precautionary behavior at the end of the discussion on ex-ante income shifting at the end of

Section II). In addition, all regressions include time and industry fixed effects, represented by δ_t and α_j, respectively. We cluster standard errors by firm (Petersen 2009).

Motivated by earlier literature, we control for several firm characteristics in the vector $\boldsymbol{z_{ijt}}$.[24] Pre-tax income as a share of total assets serves as a performance measure. The maximum tax rate differential between affiliates within the MNC captures the potential payoff from income shifting in terms of utilizing a lower tax rate. The log of total assets acts as a control for size. We include the age of the firm and control for any tax loss carry forward.

Before proceeding to the empirical results, we caution the reader when interpreting the coefficient for the current loss-position indicator. Three caveats must be taken into account. First, since the income-shifting decisions affect the probability of being in a loss position, and thus, L_{ijt}, β_1 can be subject to simultaneity bias. In Appendix A.3 the bias is derived and studied formally. The conclusion is that the simultaneity is likely to contribute to an attenuation bias in our main results, suggesting that ours are conservative estimates.

Second, the interpretation of our results depends on the ability to control for relevant firm characteristics. Since the data do not contain enough variation to use firm fixed effects, one may fear that the results are driven by unobservable characteristics. Specifically, we recognize that the baseline regressions compare companies with very different performances. Companies with large profits or losses can be very different from those that are close to break-even, despite being on the same side of zero. In order to investigate whether our results are sensitive to this issue, we also estimate the model using subsamples consisting only of firms close to break-even in order to reduce problems related to unobservable characteristics.

Third, affiliates with persistent losses might be unique and could be treated differently by MNCs. Running persistent losses should feature a high risk of bankruptcy. However, in case of bankruptcy, all income shifted to such an entity would be lost for the MNC. Though unlikely, it could also be that affiliates with persistent losses were set up to generate losses deliberately. Alternatively, it could simply be that these firms are badly managed and feature strong agency problems between the affiliate's management and the HQ. In order to be sure that persistently loss-making affiliates are not driving our results, we exclude them from the regressions in a final robustness test.

Despite our attempts to address the shortcomings in the data, we remain reluctant to interpret the point estimates as marginal effects from being in a loss position. Rather, we restrict ourselves to a discussion about how the direction of the effects corresponds to the predictions from the theoretical model, and the extent to which the estimated effects are robust.

[24]See, e.g., Møen et al. (2011), Büttner and Wamser (2013), Huizinga et al. (2008), and Rajan and Zingales (1995) for debt shifting as well as Grubert (2003) and Huizinga and Laeven (2008) for transfer pricing.

Descriptive Statistics

Panel A in Table 3 presents descriptive statistics for the explanatory variables for each of our four main regression specifications (i.e., transfer payment and internal leverage tests using the full MNC and daughters-only samples). Importantly, we observe that losses occur in 38% percent of our observations, and that this proportion is remarkably stable across all four samples. We also observe that the average tax rate differential is close to zero, reflecting that Norwegian parent companies do not face a particularly different corporate income tax rate from the non-Norwegian affiliates.

In Panel B, we report the number of observations and the number of observed losses [in brackets] for each year.[25] Due to missing data in the control variables, the number of observations is much lower in 2005 than in the earlier years. We have investigated whether this lack of observations affects our results. First, we imputed missing values in 2005 by replacing those missing with the values for 2004. Second, we excluded the year 2005. In both tests, our results are unaffected (untabulated).

[Insert Table 3 about here]

Multivariate Results

Transfer prices

Table 4 presents the main results for testing whether transfer-pricing and payment strategies are a function of losses. Columns (A) and (B) present results for our main empirical model identified in equation (13); this specification will also be used in all robustness analyses. In Column (A), we include all Norwegian based MNCs in our estimation of net outgoing transfers. In line with our descriptive evidence, there is no significant difference in transfer payments between companies with profits and losses when including all MNCs. Consistent with the findings in Dischinger et al. (2014a,b), we assume that this result, at least to some extent, is explained by the unique behavior of parent companies. Thus, we devote Columns (B)-(G) to studying daughter companies only.

[Insert Table 4 about here]

Column (B) reports our main estimates for Norwegian daughters. Recall that in the descriptive statistics, we found a statistically significant raw difference of -2.08 between

[25]Note that the empirical model technically starts with time t being 1999 rather than 1998, because we require a one-year lag to capture prior losses. Therefore, the total counts in Panel B, which include observations in 1998, as a share of each respective sample do not correspond to the share of total losses in each sample as reported in Panel A (as well as in Table 1), with the Panel B observations in 1998 accounting for the difference.

profit and loss daughter entities. After conditioning on the control variables in our multivariate tests, the effect from being in a current loss position is about -2.8. These results are consistent with loss affiliates making smaller net outgoing transfer payments than profitable affiliates.

In Column (C), we only include the loss position variables (as well as the industry and year fixed effects) and exclude the controls. We observe that omitting the control variables reduces the size (in absolute terms) and significance of the coefficient for the loss position indicator compared to Column (B). This result illustrates the importance of the control variables, even though they are individually mostly insignificant.

In Column (D), we exclude the interaction term between losses at time t and $t-1$ and instead, add a second lag of the loss position indicator (i.e., at time $t-2$) as an additional control for persistence. We observe that the coefficient for the main loss position indicator at time t is almost identical to the main estimate in Column (B), despite the fact that we lose observations by adding an extra lag.

In Column (E), we estimate an ambitious model, including two lags for the loss position indicator, in addition to interactions both between losses at t and $t-1$ and t and $t-2$. This formulation should capture persistence in losses and the effect it may have on present-day decisions, although we consider it to be too data demanding to serve as our main specification given the lower observation count. Interestingly, the coefficient for the current loss position indicator becomes more negative and significant than in Column (B). The fact that the effect of losses on net outgoing transfers seems to be stronger after we control for more variables suggests that our main estimate in Column (B) is likely a conservative estimate of the true effect.

In Columns (F) and (G), we split the net outgoing transfers into gross outgoing and gross incoming transfers. We find that our model explains much more of the variation in outgoing transfers than for incoming transfers. Moreover, we observe that the effect on net outgoing transfers is entirely driven by a reduction in gross outgoing transfers as reported in Column (F), while the incoming transfers remain unchanged as reported in Column (G). Collectively, our results suggest that loss firms engage in ex-post income shifting by reducing the amount of net outgoing transfer payments compared to profitable firms.[26]

We note that the control variables seem to have little effect on the transfer payments. However, the industry and time fixed effects capture a substantial amount of the variation, ultimately yielding an R-squared of almost 21%. Moreover, the variation in the data is rather limited. In fact, out of the 609 observations, 481 take a zero value for transfers.

[26]We have also tested other specifications based on the within-daughter variation in tax rates. In principle, the incentives to shift in to a loss-making Norwegian daughter should be stronger for affiliates in high-tax countries. Unfortunately, the within-daughter variation in tax rates is not sufficient to draw reliable inferences.

The observations with zero net transfers not only lead to little variation in our data, but leads to concern over how useful they are when estimating the effect of the transfers. Thus, in Table 5, we report results from regressions where the observations with zero transfers are omitted. Even though the precision is lower due to the large reduction in sample size, we observe that the coefficients for the loss position grow in absolute value and remain significant. In the remaining tests, we include the observations with zeroes, keeping in mind that these seem to work in the direction of conservative estimates.

[Insert Table 5 about here]

Given our results above that daughter companies experience lower outgoing transfer payments under losses than profits, in our next set of tests we explore more deeply whether the flexibility in transfer payments is higher due to the internal transfer pricing of intangibles or tangibles. It is reasonable to assume that the flexibility is greater for intangible goods, as arm's length prices are more difficult (or impossible) to observe for intangibles (e.g., trademarks and patents) compared to tangibles (e.g., cost of materials). In addition, payments for intangibles are typically due at the end of the tax year instead of being a regular expenditure during the year as for tangibles, thus affording intangibles more flexibility to respond to losses using income shifting. To explore this issue, we successively re-estimate our main regression by using the two transfer payment types as the dependent variable. In particular, we measure net outgoing transfers related to intangibles as the sum of royalties, licenses, and rent; we measure net outgoing transfers related to tangibles as the sum of cost of materials. We continue to scale these transfer payments by the firm's average total assets over the period. The results in Table 6 indicate that there is more flexibility in pricing of intangible than tangible goods; being in a loss position only has a significant effect on the former type of good.

This result is also important since it reduces concerns that our results are driven, at least in part, by market-demand effects, in that affiliates with lower demand for their products might mechanically make fewer outgoing transfer payments due to poor performance and lower intermediate inputs, rather than through the manipulation of transfer prices. In particular, if demand were a significant factor, the result on tangibles should be significant.[27]

[Insert Table 6 about here]

[27]In our second set of robustness checks at the end of Section IV, we follow up on the issue of demand-side effects and decreasing sales revenues by estimating the effects on transfer payments and internal leverage only for affiliates with non-decreasing sales revenues. The findings in that test give us confidence that our main results are driven by a reduction in transfer prices rather than a reduction in sales revenue.

Our findings reflect anecdotal evidence on transfer prices. Following conventional wisdom among practitioners, it is very expensive to change transfer prices ad hoc, particularly on tangible goods. In fact, the OECD recommends that such changes should trigger audits by tax authorities, at least in profitable affiliates. In Germany, for example, the highest fiscal court ('Bundesfinanzhof') decided in 1997 that any transfer payment benefitting a controlling owner and not being contracted on in detail in advance should be treated as a disguised dividend and fully taxed.[28]

However, for invoicing the use of intangibles, there is still some flexibility. In 2012, the German Bundesfinanzhof ruled that its earlier 1997 decision cannot be applied to international transactions that are sheltered by a double tax treaty following the standard principles for 'dealing at arm's length' in the OECD Model Convention. In the 2012 case, a German affiliate was allowed a tax-deductible transfer payment for management services by a Dutch parent company for the tax year 2004, even though a retrospective contract on the management service was agreed upon on December 29, 2004.[29]

Furthermore, MNCs have possibilities to incorporate some undisputed flexibility in setting transfer prices. For example, instead of using a fixed fee, firms can invoice licenses for intangibles by royalty payments that depend on sales revenues at the end of the tax year (or use a combination of both fixed and variable fees). As sales revenues and income are highly correlated, variable royalty payments ensure that transfer payments will decrease when being in a loss position. Combining this feature with a fixed-fee component allows for ad-hoc calibration if the fee itself can be adjusted during the tax year.

Indeed, empirical studies document that only about 10 to 30% of firms rely on fixed license fees only, while the rest either exclusively use variable royalty payments, or a combined invoicing systems (i.e., royalties plus a fixed fee).[30] One prominent example is IKEA, which levies a 3% franchise fee on sales revenue in all affiliates worldwide and channels the royalty payments to a foundation in Liechtenstein (see http://www.thelocal.se/20110126/31650). A second example is Wal-Mart, which in a dispute with the New Mexico Taxation and Revenue Department, relied on sales-dependent royalty payments in order to generate tax-preferred intangible income in Delaware (see Hecht 2006).

Internal debt

Table 7 reports our main results for internal leverage. Similar to Table 4, we analyze the full sample of MNCs in Column (A), and only daughter companies in Columns (B)-(G). Recall from the descriptive statistics that there was a negative raw difference in total in-

[28]See Bundessteuerblatt 1998 Teil II Nr. 17, p. 545. Law scholars agreed with this decision, although they were pointing to the need for some discretion in order to register the actual, 'right' costs (e.g., Schön 1998, p. 291).

[29]The companies claimed that there was an unwritten agreement settled end of 2003. See Bundessteuerblatt 2013 Teil II Nr. 23, p. 1046.

[30]See San Martín and Saracho (2010, p. 284) for a brief summary.

ternal leverage for loss versus profit firms, in both the full sample of MNCs and daughters only. However, Column (A) reports that after controlling for a wide set of covariates in a regression framework, the coefficient for our current loss position indicator is insignificant. The control variables seem to be of some more importance when estimating internal leverage, most likely because this variable contains more information than the transfer payments. In particular and as expected, the maximum tax rate differential yields a significantly positive sign in Column (A), suggesting that debt tax shields increase as tax rate differences between affiliates increase. In addition, large companies have more internal leverage than smaller firms.

[Insert Table 7 about here]

When studying the total internal leverage in Norwegian daughter companies in Columns (B)-(G), we continue to yield insignificant coefficients for the current loss-position indicator. However, even though we cannot reject that the true coefficient is zero, the large standard error suggests that we cannot definitively reject that at least some ex-post debt shifting takes place in the daughter companies.

Among the control variables, only the pre-tax income as share of assets is significant. The negative coefficient suggests, as expected, that more profitable affiliates report lower internal debt (after conditioning on all other variables). Re-estimating our models without controls in Column (C), with additional lags in Column (D), and an ambitious model with multiple lags and interaction terms in Column (E), we continue to find insignificant coefficients on the loss position indicator. Finally, in Columns (F) and (G), respectively, we report the results for splitting internal leverage into short-term and long-term maturities. Again, the coefficient for the loss-position indicator is not significant at any conventional level of significance in either of the two splits.

Robustness checks

Table 8 presents the first of three sets of robustness tests for our transfer payment and internal leverage estimations. In our first set of tests, we use sub-samples of daughter firms close to break-even. Using these sub-samples helps to reduce concerns related to unobservable characteristics, since here we only compare firms with similar performance. Just as splitting on tangibles and intangibles, this set of tests should help alleviate concerns that our results are driven, at least in part, by market-demand effects, in that affiliates with lower demand for their products might mechanically make fewer outgoing transfer payments due to poor performance, rather than through the manipulation of transfer prices. Thus, by focusing on a sub-sample of affiliates just above and just below zero income, we attempt to rule out that performance simply explains our empirical results, and endeavor to make stronger inferences that transfer pricing is a significant component

explaining the differences we observe in transfer payments between profitable and loss-making affiliates.

[Insert Table 8 about here]

In Columns (A) and (B), we restrict the sample to daughter companies with pre-tax income over assets between the 25th and 75th percentile, i.e., we exclude the highest and lowest performers in year t. In Columns (C) and (D), we go further and keep only daughter companies with pre-tax income over assets between -1.5% and 1.5%. We observe that the number of observations is reduced heavily in both cases.

The results for net outgoing transfers are displayed in Columns (A) and (C). Interestingly, we see that the coefficient on the loss position indicator becomes more negative and significant compared to the main regressions in Table 4. Specifically, when using the less restrictive cut-off in Column (A), the coefficient is more than twice as negative as in the main tests (i.e., Column (B), Table 4), while it is more than three times as negative when using the more restrictive cut-off in Column (C).

Results for total internal leverage are reported in Columns (B) and (D). We observe that even though the coefficients also become more negative compared to the main tests in Table 7, they are still far from being significant at any conventional statistical level. Accordingly, we continue to conclude that companies seem to use internal leverage to a lesser extent than transfer pricing when shifting losses ex post. This interpretation is in line with both our model and Büttner and Wamser (2013) who suggest that the adjustment costs of a firm's capital structure are high. However, since the simultaneity bias might lead to an attenuation bias, we cannot definitively conclude that internal leverage is not changed as a response to losses. Nevertheless, transfer pricing seems to be the more flexible tool of the two income-shifting strategies.

In our second set of robustness tests, we again try to rule out that a reduction in demand (which may be more acute in loss firms), rather than reduction in transfer prices, is driving our main results. This concern arises because our data only report total transfer payments and not their components (i.e., changes in quantities versus changes in prices). We re-estimate Eq. (13) after dropping firms with decreasing sales revenue from period $t-1$ to t. Dropping these firms reduces the likelihood that a drop in quantities caused the loss, which in turn could have reduced total transfer payments, while transfer prices in fact remained unchanged. Our results are reported in Table 9. We continue to find evidence consistent with our main results that loss firms make lower outgoing transfer payments (see column (A)); in fact, the coefficient on our loss indicator is very similar in size to the coefficient we report in our main specification in column (B) of Table 4. Importantly, because quantity demand is likely constant or increasing in these tests, we can now more reliably interpret our results as loss firms reducing transfer *prices* to shift

income. Also consistent with our previous findings, we do not find a significant coefficient for the effect of losses on internal leverage (see column (B)).

[Insert Table 9 about here]

In our third set of robustness tests, we exclude affiliates with persistent losses. As discussed with our empirical strategy in Section IV, affiliates that are unable to generate any profits might be unique and treated differently from other affiliates. Table 10 reports our results after re-estimating our main tests on the sub-sample of daughter companies. In Columns (A) and (B), we exclude affiliates generating losses in all years they appear in the data, while in Columns (C) and (D), we exclude firms that generate losses in at least 75% of the years. These results remain similar to our baseline results.

[Insert Table 10 about here]

V. CONCLUSION

This paper examines multinational firms' flexibility to adjust their income-shifting strategies during the tax year when some affiliates incur losses. The theory portion of our study suggests that flexibility in adjusting income shifting has important implications for firm behavior in achieving efficient tax reporting under losses. Under full flexibility, firms can adjust their payments ex post, i.e., before the end of the tax year but after observing profit or loss realization, and ensure zero taxable income. Without flexibility, firms have to decide ex ante on their income-shifting strategies and cannot revisit these decisions once they are taken.

According to our empirical estimation using data on Norwegian multinationals and affiliates, we conclude that transfer-price manipulation provides firms with flexibility to adjust their income-shifting strategies ex post, while we cannot reject zero flexibility for internal leverage. Transfer pricing also seems to be the more important income shifting tool, with intangibles driving most of the flexibility. Our robustness tests are consistent with changes in transfer prices, rather than underlying firm performance or weak customer demand, explaining our results.

Based on the empirical evidence, our finding of flexibility in transfer pricing complements empirical studies that find large effects on the tax sensitivity of transfer pricing (e.g., Swenson 2001; Clausing 2003; Bartelsman and Beetsma 2003; and Langli and Saudagaran 2004). Given high flexibility, the anticipation of losses to come within the tax year does not matter as much for the behavior of affiliates that report positive income at year's end.

Accordingly, the standard procedure by researchers to exclude affiliates reporting negative income seems to work well for transfer pricing settings and eliminates the offsetting effects of reverted income-shifting strategies under losses.

However, if taken at face value, our results for internal leverage may cause some concern for the empirical literature on debt shifting that omits loss making affiliates. If flexibility is low, the probability of running losses is taken into account when deciding on internal leverage and one thus risks underestimating the true effect of the tax rate differential by disregarding loss-making affiliates.

While most of the existing empirical work investigates income shifting of profitable affiliates to low-tax countries, income shifting to unprofitable non-haven affiliates seems to have escaped the attention of most researchers and policymakers. Namely, understanding and regulating firms' incentives to adjust income shifting largely overlooks the scenario of firms' flexibility in shifting income to non-haven affiliates with operating losses. Therefore, tax authorities and policymakers (e.g., OECD 2013) should both increase their focus on firms whose income concentrates around zero, and scrutinize payments to non-haven affiliates that disclose operating losses.

A. APPENDIX

A.1. Derivation of the Ex-post Optimal Abusive Transfer Prices

Differentiating the concealment cost function given in equation (8), we obtain as marginal concealment costs for manipulating the transfer prices of the license fee and the intermediate input good, respectively,

$$\frac{\partial C^P}{\partial P_i^X} = \left[\frac{\eta_X}{2}\left(P_i^X\right)^2 + \frac{\eta_S}{2}\left(P_i^S\right)^2\right]\eta_X P_i^X, \tag{A.1}$$

$$\frac{\partial C^P}{\partial P_i^S} = \left[\frac{\eta_X}{2}\left(P_i^X\right)^2 + \frac{\eta_S}{2}\left(P_i^S\right)^2\right]\eta_S P_i^S. \tag{A.2}$$

By equating the two expressions (A.1) and (A.2), we find an 'inverse-cost rule' for transfer-pricing devices,[31]

$$\frac{P_i^S}{P_i^X} = \frac{\eta_X}{\eta_S}, \tag{A.3}$$

Relying on equation (A.3) in order to substitute for P_i^S in equations (A.1) and using (4b) leads to the optimal (abusive) transfer prices in the case of a profitable affiliate

$$\left(G_i^X\right)^* = \sqrt[3]{\frac{\eta_S}{\eta_S+\eta_X}\cdot\frac{2}{(\eta_X)^2}\cdot(\mathbb{1}_i t_i - t_1)}\,\frac{1}{\bar{X}}. \tag{A.4}$$

Analogously, we can determine the optimal transfer price for the intermediate good and obtain

$$\left(G_i^S\right)^* = \sqrt[3]{\frac{\eta_X}{\eta_S+\eta_X}\cdot\frac{2}{(\eta_S)^2}\cdot(\mathbb{1}_i t_i - t_1)}\,\frac{1}{S_i}. \tag{A.5}$$

[31] Note that, in the optimum, marginal concealment costs will be equalized for both transfer-pricing strategies.

A.2. Derivation of the First-order Conditions for Ex-ante Tax-planning

In the following, we report the first-order condition for the license-fee transfer price in the case that all income-shifting decisions need to be taken ex ante (i.e., before the true sales price is revealed). This first-order condition is given by

$$\begin{aligned}\frac{\partial E(\Pi)}{\partial G_i^X} &= -\bar{X} + (1 - H(p_i^0))t_i\bar{X} - \frac{\partial C^P}{\partial P_i^X}\bar{X} + (1-t_1)\bar{X} + h(p_i^0)t_i p_i^0 y_i \frac{\partial p_i^0}{\partial G_i^X} \\ &- h(p_i^0)t_i[(G_i^X + q_X)\bar{X} + (G_i^S + q_S)S_i + rb_iK_i]\frac{\partial p_i^0}{\partial G_i^X} = 0. \end{aligned} \tag{A.6}$$

Rearranging the terms gives

$$\begin{aligned}&\left[(1 - H(p_i^0))t_i - t_1 - \frac{\partial C^P}{\partial P_i^X}\right]\bar{X} \\ &- h(p_i^0)t_i[p_i^0 y_i - (G_i^X + q_X)\bar{X} - (G_i^S + q_S)S_i - rb_iK_i]\frac{\partial p_i^0}{\partial G_i^X} = 0. \end{aligned} \tag{A.7}$$

Recall that the price p_i^0 is defined as the price for which taxable income is zero. Hence, the term in the second line vanishes as the value of the squared brackets is zero. Therefore, we obtain

$$[1 - H(p_i^0)]t_i - t_1 = \frac{\partial C^P}{\partial P_i^X}. \tag{A.8}$$

A.3. Simultaneity Bias

Our aim is to estimate the effect from being in a loss position ($L_{it} = 1$ if firm i experiences a loss in year t, zero otherwise) on transfer payments and internal leverage in year t, y_{it}. z_{it} is an exogenous control variable (or a vector of such) that is potentially correlated with both y_{it} and the probability of experiencing a loss.

$$y_{it} = \alpha_1 L_{it} + \beta_{10} + \beta_{11} z_{it} + u_{1it},\ \alpha_1 < 0 \tag{A.9}$$

The problem is that reducing outgoing transfer prices and/or lowering internal leverage also lowers the probability of experiencing losses. We thus also have the following relationship

$$L_{it} = \alpha_2 y_{it} + \beta_{20} + \beta_{22} z_{it} + u_2,\ \alpha_2 > 0 \tag{A.10}$$

This is an example of two-way causality, where both variables have an effect on the other. (A.9) and (A.10) present the model in structural form. The reduced form presentation is found by solving the system for the two endogenous variables and finding quantity and price as functions of the exogenous variable(s). The solution for y_{it} is then given by

$$y_{it} = \underbrace{\frac{\beta_{10} - \alpha_1\beta_{20}}{1 - \alpha_1\alpha_2}}_{\pi_{10}} + \underbrace{\frac{\beta_{11} - \beta_{22}}{1 - \alpha_1\alpha_2}}_{\pi_{11}} z_{it} + \underbrace{\frac{u_{1it} - \alpha_1 u_{2it}}{1 - \alpha_1\alpha_2}}_{e_{1it}}$$

By introducing some auxiliary notation, this reduces to

$$y_{it} = \pi_{10} + \pi_{11} z_{it} + e_{1it} \tag{A.11}$$

Similarly, we find the solution for the loss position indicator as

$$L_{it} = \underbrace{\frac{\beta_{20} + \alpha_2\beta_{10}}{1 - \alpha_1\alpha_2}}_{\pi_{20}} - \underbrace{\frac{\beta_{11} + \beta_{22}}{1 - \alpha_1\alpha_2}}_{\pi_{21}} z_{it} + \underbrace{\frac{u_{2it} + \alpha_2 u_{1it}}{1 - \alpha_1\alpha_2}}_{e_{2it}}$$

Again, auxiliary notation helps to make the notation more compact

$$L_{it} = \pi_{20} + \pi_{21} z_{it} + e_{2it} \tag{A.12}$$

(A.11) and (A.12) give the reduced form presentation of the model, since transfer prices and loss position are given as functions only of exogenous variables.

In this paper, we estimate the structural equation (A.9). The problem by estimating this equation directly is that L_{it} is endogenously decided within the model and thus

correlated with the error term u_{1it}. The covariance between L_{it} and u_{1it} is

$$\text{cov}\left(L_{it},\, u_{1it}\right) = E\left[\left(\pi_{20} + \pi_{21} z_{it} + e_{2it}\right) u_{1it}\right] = E\left(e_{2it} u_{1it}\right)$$

since the z-variable(s) is/are exogenous. If we insert for e_{2it}, and assume that u_{1it} and u_{2it} are uncorrelated, we obtain

$$\text{cov}\left(L_{it},\, u_{1it}\right) = E\left(\frac{u_2 + \alpha_2 u_1}{1 - \alpha_1 \alpha_2} u_1\right) = \frac{\alpha_2 \sigma_1^2}{1 - \alpha_1 \alpha_2} > 0 \tag{A.13}$$

since $\alpha_2 > 0$, and $1 - \alpha_1 \alpha_2 > 0$. $\sigma_1^2 = E\left(u_{1it}^2\right)$, the variance of u_1, assuming homoscedasticity. Importantly, OLS is likely to give a positive bias in the estimator for α_1. Keep in mind that this parameter is negative, meaning that OLS will underestimate the effect from losses on transfer payments/internal leverage.

A.4. Definition of Variables

Dependent variables	
Net outgoing transfer payments	The net outgoing transfer payments to royalties, license fees, rental expenditures, and purchases, standardized by mean total assets over the period in order to adjust for size.
Gross outgoing transfer payments	The gross outgoing transfer payments over all categories, standardized by mean total assets over the period in order to adjust for size.
Gross incoming transfer payments	The gross incoming transfer payments over all categories, standardized by mean total assets over the period in order to adjust for size.
Net outgoing transfer payments for intangible goods	The net outgoing transfer payments to royalties, license fees and rental expenditures, standardized by the mean total assets over the period in order to adjust for size.
Net outgoing transfer payments for tangible goods	The net outgoing transfer payments for purchases (cost of materials), standardized by mean total assets over the period in order to adjust for size.
Total internal leverage	Total internal debt divided by mean total assets.
Short-term internal leverage	Short-term internal debt divided by mean total assets.
Long-term internal leverage	Long-term internal debt divided by mean total assets.
Explanatory variables	
Loss position indicator	A dummy equal to 1 if a firm runs a loss in year t, zero otherwise.
Loss position at t and $t-1$	A dummy equal to 1 if a firm runs a loss in both year t and $t-1$, zero otherwise.
Loss position at t and $t-2$	A dummy equal to 1 if a firm runs a loss in both year t and $t-2$, zero otherwise.
Pre-tax income	The firm's taxable income (result) as share of total assets.
Maximum tax rate differential	The Norwegian business tax rate (28%) less the tax rate for the affiliate with the lowest tax rate.
Log of total assets	The natural logarithm of the firm's total assets (in 1,000 NOK).

Company age (in years)	The age of the company.
Loss carry forward	Loss carry forward as share of pre-tax income.

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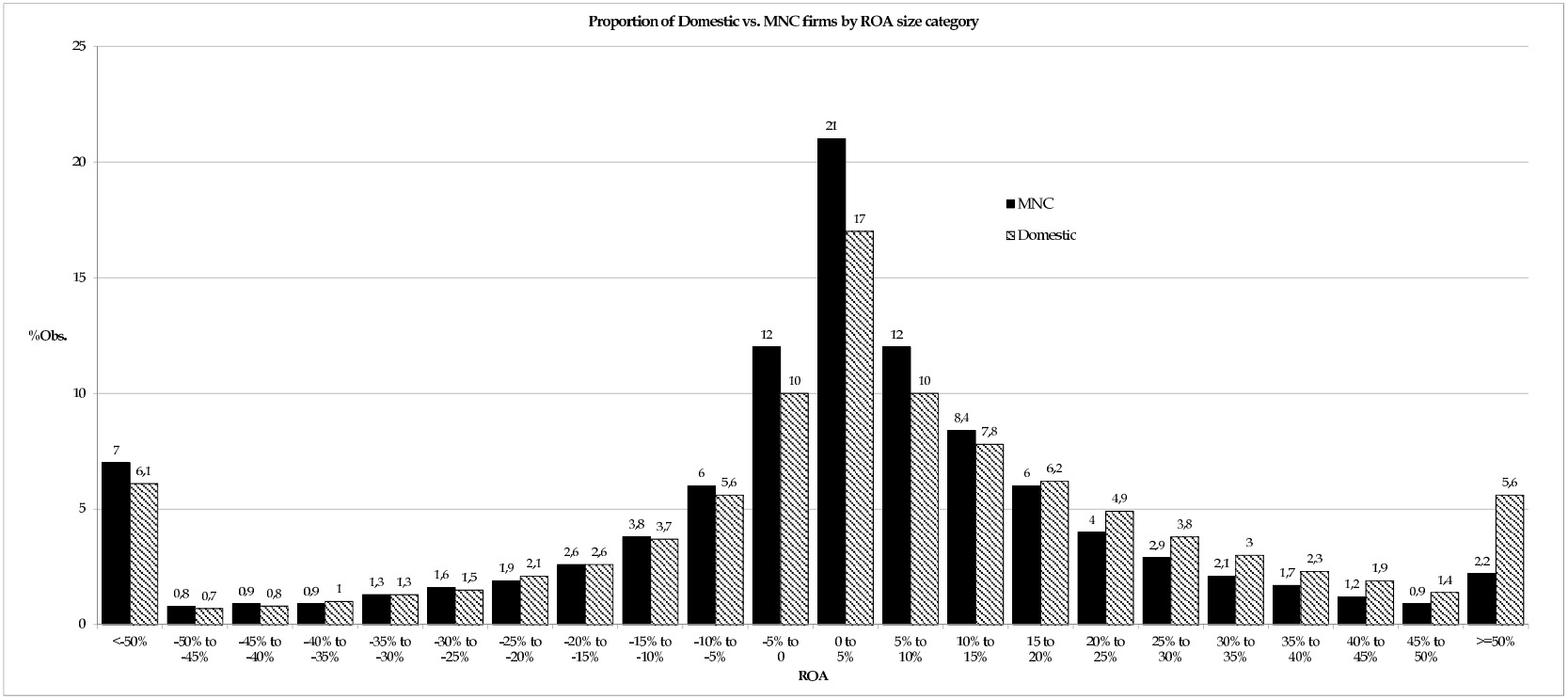
Figure 1: Distribution of pre-tax income over assets



This figure plots the proportion of Norwegian multinational firms (solid bars) and purely domestic firms (striped bars) with return on assets (ROA, or income before taxes scaled by total assets) within 5% increments from -50% to +50%. The 5% increments are inclusive of the lower value, but exclusive of the upper value, e.g., [-10%; -5%), [-5%; 0), [0;+5%), [5%; 10%), etc. Outliers are summarized in the ROA categories of <-50% and >50%. We use data from Dun & Bradstreet for years 1998-2005.

Table 1: Descriptive statistics, main dependent variables.

	Full sample	In loss position	Not in loss position	Difference
Net outgoing transfer payments				
All MNCs	-1.68	-1.39	-1.85	0.46
(St.dev.)	(10.19)	(9.15)	(10.77)	
Number of obs.	5,455	2,088	3,367	
Norwegian daughters	0.63	-0.65	1.43	-2.08***
(St.dev)	(8.39)	(5.50)	(6.69)	
Number of obs.	609	234	375	
Total internal debt				
All MNCs	4.61	4.09	4.94	-0.85**
(St.dev.)	(14.67)	(13.83)	(15.16)	
Number of obs.	5,226	1,989	3,237	
Norwegian daughters	4.66	3.12	5.60	-2.48*
(St.dev)	(15.22)	(12.14)	(16.77)	
Number of obs.	583	221	362	

This table reports the mean, standard deviation, and number of observations for transfer payments and internal leverage for our sample of Norwegian multinationals and daughter (subsidiary) companies. Transfer payments and internal leverage are standardized as a percent of the firm's average total assets over the sample period (1998-2005) and winsorized at the 1 percent level. *, **, and *** denote statistical significance levels of $p < 0.10$, 0.05, and 0.01, respectively (two-tailed) using a t-test. See Appendix A.4 for full variable definitions.

Table 2: Autocorrelation in loss positions

All MNCs	Loss at time t	Loss at time $t-1$
Loss at time $t-1$ ($N = 5,455$)	0.40***	
Loss at time $t-2$ ($N = 4,680$)	0.28***	0.39***
Daughters	Loss at time t	Loss at time $t-1$
Loss at time $t-1$ ($N = 609$)	0.37***	
Loss at time $t-2$ ($N = 528$)	0.29***	0.41***

This table reports the correlation of losses at times t, t-1, and t-2 for our sample of Norwegian multinationals and daughter (subsidiary) companies. *, **, and *** denote statistical significance levels of p $<$ 0.10, 0.05, and 0.01, respectively (two-tailed).

Table 3: Descriptive statistics, explanatory variables.

Panel A: Descriptive statistics for main regression samples.				
Regression Sample:	Net outgoing transfer payments, all MNCs ($N = 5,455$)	Net outgoing transfer payments, only daughter companies ($N = 609$)	Total internal leverage, all MNCs ($N = 5,226$)	Total internal leverage, only daughter companies ($N = 583$)
Loss position indicator	0.38	0.38	0.38	0.38
	(0.49)	(0.49)	(0.49)	(0.49)
Losses both at time t	0.25	0.25	0.25	0.24
and $t-1$	(0.43)	(0.43)	(0.43)	(0.43)
Pre-tax income as share	-0.03	-0.01	-0.03	-0.01
of total assets	(0.45)	(0.32)	(0.45)	(0.32)
Maximum tax rate	0.02	0.01	0.02	0.003
differential	(0.09)	(0.07)	(0.08)	(0.07)
Log of total assets	11.13	11.49	11.13	11.49
	(1.60)	(1.44)	(1.58)	(1.44)
Company age	17.81	14.47	17.81	14.60
	(19.24)	(14.31)	(19.17)	(14.11)
Loss carry forward as	0.01	0.11	0.02	0.12
share of pre-tax income	(0.77)	(0.87)	(0.78)	(0.89)
Panel B: Number of observations in each year for the main regressions [number of obs. in loss position in brackets]				
1998	494 [190]	42 [20]	491 [190]	42 [20]
1999	536 [171]	53 [17]	536 [171]	53 [17]
2000	786 [295]	89 [39]	785 [295]	89 [39]
2001	958 [444]	101 [45]	956 [443]	101 [45]
2002	996 [443]	107 [44]	993 [441]	107 [44]
2003	973 [371]	110 [46]	883 [332]	110 [41]
2004	942 [284]	120 [35]	853 [248]	120 [30]
2005	264 [80]	29 [8]	220 [59]	29 [5]

This table reports descriptive statistics for our four main regressions using transfer payments and internal leverage for our sample of Norwegian multinationals and daughter (subsidiary) companies. Panel A reports mean values; standard deviations are reported in parentheses. Panel B reports the total number of observations and loss observations (in brackets) by year. Pre-tax income, total assets, and loss carry forward are winsorized at the 1 percent level. See Appendix A.4 for full variable definitions.

Table 4: Estimation of transfer payments.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
	All MNCs	Norwegian daughters					
	Net outgoing transfers	Net outgoing transfers	Net outgoing transfers	Net outgoing transfers	Net outgoing transfers	Gross outgoing transfers	Gross incoming transfers
Loss position at time t	-0.0300	-2.813**	-1.748*	-2.752**	-3.381**	-3.123*	0.421
	(0.452)	(1.324)	(0.929)	(1.220)	(1.510)	(1.618)	(0.720)
Loss position at time $t-1$	0.198	-1.259	-1.019	-0.636	-0.527	-2.093*	-0.188
	(0.380)	(0.830)	(0.684)	(0.541)	(0.911)	(1.081)	(0.388)
Loss position at time $t-2$				-0.678	-1.449		
				(0.688)	(0.946)		
Loss position both	0.674	0.448	0.190		-0.118	1.020	0.370
at t and $t-1$	(0.650)	(1.075)	(0.930)		(1.201)	(1.183)	(0.717)
Loss position both at					1.753		
t and $t-2$					(1.405)		
Pre-tax income as share	-0.0739	-0.874		-1.727	-1.509	-0.883	-0.00938
of total assets	(0.203)	(1.244)		(1.190)	(1.165)	(1.886)	(0.444)
Maximum tax rate	-3.028	5.896		7.890	8.103	15.32	2.801
differential	(3.046)	(7.931)		(9.842)	(9.790)	(13.79)	(2.090)
Log of total assets	-0.309*	-0.678		-0.680	-0.664	-0.695	0.418**
	(0.167)	(0.422)		(0.464)	(0.466)	(0.660)	(0.189)
Company age	-0.00338	-0.0109		-0.00184	-0.00146	-0.0603	-0.0157
	(0.0128)	(0.0482)		(0.0511)	(0.0510)	(0.0721)	(0.0138)
Loss carry forward as	0.244	-0.208		-0.241	-0.158	-0.109	0.00642
share of pre-tax income	(0.161)	(0.414)		(0.420)	(0.401)	(0.550)	(0.262)
Observations	5,455	609	720	528	528	609	609
R-squared	0.087	0.208	0.176	0.232	0.234	0.188	0.082

This table reports the results of estimating OLS regressions of transfer payments using Eq. (13). Column (A) uses all Norwegian multinational companies. Columns (B) through (G) use Norwegian daughter (subsidiary) companies only. The transfer payment dependent variables are reported along the top of each column. The variable of interest is Loss position at time t, calculated as an indicator equal to one if the firm reported a loss for the period; zero otherwise. A constant term and time and industry dummies (not reported) are included in all regressions. The transfer payments are standardized as a percent of the firm's average total assets over the sample period (1998-2005) and winsorized at the 1 percent level. *, **, and *** denote statistical significance levels of $p < 0.10$, 0.05, and 0.01, respectively (two-tailed). Reported t-statistics are based on robust standard errors clustered by firm. See Appendix A.4 for full variable definitions.

Table 5: Net transfer payments. Observations where net transfers equal to zero excluded, only daughter companies

	(A)	(B)	(C)
Loss position at time t	-11.26*	-13.38**	-15.52**
	(6.528)	(6.115)	(7.092)
Loss position at time $t-1$	-0.638	0.0262	1.292
	(3.121)	(2.550)	(3.415)
Loss position at time $t-2$		-0.894	-4.357
		(3.175)	(4.808)
Loss position both	2.907		-2.599
at t and $t-1$	(5.991)		(5.506)
Loss position both at			10.22
t and $t-2$			(8.499)
Pre-tax income as share	0.416	-14.26	-12.59
of total assets	(13.01)	(11.67)	(10.08)
Maximum tax rate	36.86	29.19	19.88
differential	(22.52)	(26.76)	(31.78)
Log of total assets	-5.099**	-3.881*	-3.028
	(2.288)	(2.218)	(2.805)
Company age	0.0326	-0.0280	-0.0336
	(0.100)	(0.142)	(0.150)
Loss carry forward as	-2.867	-3.488*	-3.035
share of pre-tax income	(1.886)	(1.977)	(1.991)
Observations	128	110	110
R-squared	0.712	0.741	0.749

This table reports the results of estimating OLS regressions of non-zero net transfer payments using Eq. (13) on only Norwegian daughter (subsidiary) companies. The dependent variable is net outgoing transfer payments made by Norwegian daughter companies. The variable of interest is Loss position at time t, calculated as an indicator equal to one if the firm reported a loss for the period; zero otherwise. A constant term and time and industry dummies (not reported) are included in all regressions. The transfer payments are standardized as a percent of the firm's average total assets over the sample period (1998-2005) and winsorized at the 1 percent level. *, **, and *** denote statistical significance levels of $p < 0.10$, 0.05, and 0.01, respectively (two-tailed). Reported t-statistics are based on robust standard errors clustered by firm. See Appendix A.4 for full variable definitions.

Table 6: Transfer payments split on net outgoing payments for intangibles and tangibles. Only daughter companies included.

	(A) Intangibles	(B) Tangibles
Loss position at time t	-0.0155*	-0.00691
	(0.00909)	(0.00663)
Loss position at time $t-1$	-0.00655	-0.00158
	(0.00494)	(0.00369)
Loss position both	0.00513	-0.00148
at t and $t-1$	(0.00627)	(0.00598)
Pre-tax income as share	-0.0125*	0.00409
of total assets	(0.00740)	(0.00434)
Maximum tax rate	0.0711	-0.0402**
differential	(0.0500)	(0.0190)
Log of total assets	-0.00164	-0.00207
	(0.00221)	(0.00162)
Company age	2.73e-06	8.77e-05
	(0.000342)	(0.000109)
Loss carry forward as	-0.00280	0.000471
share of pre-tax income	(0.00188)	(0.00243)
Observations	609	609
R-squared	0.250	0.137

This table reports the results of estimating OLS regressions of transfer payments using Eq. (13) on only Norwegian daughter (subsidiary) companies. The dependent variable in Column (A) is net outgoing transfers related to intangible assets, or the sum of royalties, license fees, rental expenses, and research and development costs. The dependent variable in Column (B) is net outgoing transfer related to tangible assets, or purchases (i.e., cost of materials). The variable of interest is Loss position at time t, calculated as an indicator equal to one if the firm reported a loss for the period; zero otherwise. A constant term and time and industry dummies (not reported) are included in all regressions. The transfer payments are standardized as a percent of the firm's average total assets over the sample period (1998-2005) and winsorized at the 1 percent level. *, **, and *** denote statistical significance levels of $p < 0.10$, 0.05, and 0.01, respectively (two-tailed). Reported t-statistics are based on robust standard errors clustered by firm. See Appendix A.4 for full variable definitions.

Table 7: Estimation of internal leverage.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
	All MNCs	Norwegian daughters					
	Total internal leverage	Total internal leverage	Total internal leverage	Total internal leverage	Total internal leverage	Short-term internal leverage	Long-term internal leverage
Loss position at time t	0.00547	-0.520	0.505	-1.857	-0.444	0.694	-1.214
	(0.624)	(2.313)	(2.195)	(1.467)	(2.735)	(1.937)	(0.856)
Loss position at time $t-1$	-0.118	0.381	0.247	-1.881	0.796	1.713	-1.332
	(0.612)	(2.118)	(1.796)	(1.457)	(2.753)	(1.785)	(0.810)
Loss position at time $t-2$				-1.513	-2.788		
				(1.866)	(2.340)		
Loss position both	0.319	-3.862	-3.648		-5.750	-4.605	0.743
at t and $t-1$	(0.947)	(3.690)	(3.133)		(4.573)	(3.258)	(1.024)
Loss position both at					2.661		
t and $t-2$					(2.919)		
Pre-tax income as share	0.358	-3.511**		-4.245**	-4.406**	-2.414	-1.097*
of total assets	(0.360)	(1.623)		(1.798)	(1.761)	(1.508)	(0.605)
Maximum tax rate	16.82***	-0.816		1.910	0.895	1.808	-2.624
differential	(3.698)	(10.16)		(12.04)	(12.05)	(9.029)	(3.428)
Log of total assets	0.295*	-0.0113		-0.0413	0.0222	-0.0257	0.0144
	(0.170)	(0.510)		(0.587)	(0.595)	(0.484)	(0.130)
Company age	-0.00795	-0.0836		-0.117*	-0.117*	-0.0329	-0.0507*
	(0.0154)	(0.0572)		(0.0655)	(0.0660)	(0.0427)	(0.0259)
Loss carry forward as	-0.334	-0.328		-0.217	-0.304	-0.345	0.0170
share of pre-tax income	(0.288)	(0.867)		(0.890)	(0.867)	(0.576)	(0.452)
Observations	5,226	583	688	504	504	583	583
R-squared	0.151	0.214	0.214	0.221	0.226	0.174	0.210

This table reports the results of estimating OLS regressions of internal leverage using Eq. (13). Column (A) uses all Norwegian multinational companies. Columns (B) through (G) use Norwegian daughter (subsidiary) companies only. The internal leverage dependent variables are reported along the top of each column. The variable of interest is Loss position at time t, calculated as an indicator equal to one if the firm reported a loss for the period; zero otherwise. A constant term and time and industry dummies (not reported) are included in all regressions. Internal leverage is calculated as debt standardized as a percent of the firm's average total assets over the sample period (1998-2005) and winsorized at the 1 percent level. *, **, and *** denote statistical significance levels of $p < 0.10$, 0.05, and 0.01, respectively (two-tailed). Reported t-statistics are based on robust standard errors clustered by firm. See Appendix A.4 for full variable definitions.

Table 8: Estimations on sub-samples close to break-even. Only daughter companies included.

	(A) Net outgoing transfers	(B) Total internal leverage	(C) Net outgoing transfers	(D) Total internal leverage
Loss position at time t	-6.331**	-1.369	-9.230**	-9.998
	(2.469)	(3.131)	(4.535)	(11.49)
Loss position at time $t-1$	-1.674*	0.362	-0.581	-2.673
	(0.869)	(2.373)	(1.175)	(3.866)
Loss position both	1.511	-5.567	1.471	7.829
at t and $t-1$	(1.458)	(4.754)	(2.624)	(8.824)
Pre-tax income as share	-21.39**	-28.47	-383.4**	-193.3
of total assets	(10.19)	(20.75)	(190.0)	(571.3)
Maximum tax rate	6.540	-12.00	12.68	-2.131
differential	(8.370)	(11.50)	(18.83)	(24.83)
Log of total assets	-0.659	0.429	-1.666**	-0.559
	(0.546)	(0.505)	(0.797)	(1.040)
Company age	-0.00877	-0.0833	-0.0105	-0.242
	(0.0601)	(0.0752)	(0.0615)	(0.150)
Loss carry forward as	-0.791	-1.088	-0.500	2.400*
share of pre-tax income	(0.537)	(1.013)	(0.678)	(1.383)
Observations	410	396	104	102
R-squared	0.307	0.254	0.442	0.511
Sample	Pre-tax income over assets between -6% and 18% (25th-75th percentile)	Pre-tax income over assets between -6% and 18% (25th-75th percentile)	Pre-tax income over assets between -1.5% and 1.5%	Pre-tax income over assets between -1.5% and 1.5%

This table reports the results of estimating OLS regressions of transfer payments and internal leverage using Eq. (13) on only Norwegian daughter (subsidiary) companies that are close to break-even. The break-even criterion in Columns (A) and (B) is that the firm is within the 25th and 75th percentile of the sample's pre-tax income over assets. The break-even criterion in Columns (C) and (D) is that the firm is within -1.5% and 1.5% of the sample's pre-tax income over assets. The variable of interest is Loss position at time t, calculated as an indicator equal to one if the firm reported a loss for the period; zero otherwise. A constant term and time and industry dummies (not reported) are included in all regressions. The transfer payments and debt are standardized as a percent of the firm's average total assets over the sample period (1998-2005) and winsorized at the 1 percent level. *, **, and *** denote statistical significance levels of $p < 0.10$, 0.05, and 0.01, respectively (two-tailed). Reported t-statistics are based on robust standard errors clustered by firm. See Appendix A.4 for full variable definitions.

Table 9: Estimations on sub-sample with non-decreasing sales revenue. Only daughter companies included.

	(A) Net outgoing transfers	(B) Total internal leverage
Loss position at time t	-2.939*	-2.463
	(1.735)	(2.344)
Loss position at time $t-1$	0.271	-1.982
	(0.964)	(2.285)
Loss position both	0.200	-1.199
at t and $t-1$	(1.490)	(3.293)
Pre-tax income as share	-1.833	-3.019
of total assets	(1.808)	(2.999)
Maximum tax rate	3.651	17.32*
differential	(6.817)	(9.832)
Log of total assets	-0.364	-0.253
	(0.369)	(0.601)
Company age	0.0264	-0.143***
	(0.0522)	(0.0523)
Loss carry forward as	-0.513	-0.347
share of pre-tax income	(0.488)	(0.762)
Observations	389	367
R-squared	0.211	0.360

This table reports the results of estimating OLS regressions of transfer payments and internal leverage using Eq. (13) on only Norwegian daughter (subsidiary) companies that do not feature a decrease in sales revenue from period $t-1$ to period t. The variable of interest is Loss position at time t, calculated as an indicator equal to one if the firm reported a loss for the period; zero otherwise. A constant term and time and industry dummies (not reported) are included in all regressions. The transfer payments and debt are standardized as a percent of the firm's average total assets over the sample period (1998-2005) and winsorized at the 1 percent level. *, **, and *** denote statistical significance levels of $p < 0.10$, 0.05, and 0.01, respectively (two-tailed). Reported t-statistics are based on robust standard errors clustered by firm. See Appendix A.4 for full variable definitions.

Table 10: Omitting companies with persistent losses. Only daughter companies included.

	(A) Net outgoing transfers	(B) Total internal leverage	(C) Net outgoing transfers	(D) Total internal leverage
Loss position at time t	-3.076**	-0.122	-2.842*	-0.450
	(1.515)	(2.304)	(1.525)	(2.421)
Loss position at time $t-1$	-1.098	0.230	-0.314	0.849
	(0.813)	(2.152)	(0.729)	(2.294)
Loss position both	0.0805	-3.751	-1.018	-3.332
at t and $t-1$	(1.102)	(3.823)	(1.172)	(4.139)
Pre-tax income as share	-1.524	-1.910	-2.149	-3.159
of total assets	(2.077)	(2.367)	(3.054)	(3.231)
Maximum tax rate	6.647	-1.993	5.709	-8.451
differential	(8.301)	(11.19)	(7.879)	(10.94)
Log of total assets	-0.674	0.0911	-0.752	0.524
	(0.431)	(0.521)	(0.518)	(0.458)
Company age	-0.0101	-0.0911	-0.00723	-0.0811
	(0.0482)	(0.0576)	(0.0503)	(0.0610)
Loss carry forward as	-0.415	-0.276	-0.426	-1.320
share of pre-tax income	(0.475)	(0.910)	(0.512)	(0.878)
Observations	573	549	504	484
R-squared	0.218	0.221	0.250	0.216
Companies excluded	Loss in all years	Loss in all years	Loss in at least 75% of years	Loss in at least 75% of years

This table reports the results of estimating OLS regressions of transfer payments and internal leverage using Eq. (13) on only Norwegian daughter (subsidiary) companies that report persistent losses. The criterion for persistent losses in Columns (A) and (B) is that the firm has a loss in all years it appears in the sample. The criterion for persistent losses in Columns (C) and (D) is that the firm has a loss in at least 75% of the year it appears in the sample. The variable of interest is Loss position at time t, calculated as an indicator equal to one if the firm reported a loss for the period; zero otherwise. A constant term and time and industry dummies (not reported) are included in all regressions. The transfer payments and debt are standardized as a percent of the firm's average total assets over the sample period (1998-2005) and winsorized at the 1 percent level. *, **, and *** denote statistical significance levels of $p < 0.10$, 0.05, and 0.01, respectively (two-tailed). Reported t-statistics are based on robust standard errors clustered by firm. See Appendix A.4 for full variable definitions.