

Profit shifting and the effect of stricter transfer pricing regulation on tax revenue

BY Julia Tropina Bakke, Arnt Ove Hopland and Jarle Møen

DISCUSSION PAPER

NHH



Institutt for foretaksøkonomi
Department of Business and Management Science

FOR 11/2019

ISSN: 1500-4066

October 2019

Profit shifting and the effect of stricter transfer pricing regulation on tax revenue*

September 30, 2019

Julia Tropina Bakke, Arnt Ove Hopland and Jarle Møen

NHH Department of Business and Management Science

and the Norwegian Center for Taxation

Abstract

Using a 20-year-long, population-wide panel with detailed firm and group level data from Norway, we study the profitability change in companies that shift from being domestic to being multinational as well as companies that shift from being multinational to being domestic. Profitability falls when domestic companies become multinational and increases when multinational companies become domestic. The average change in profitability is about 24 %, all else equal. We attribute our findings to the profit shifting opportunities that are available for multinational companies, and we display several patterns in the data that are consistent with this interpretation. We find that the extent of profit shifting decreases after the introduction of stricter transfer pricing regulations, and an increase in transfer pricing audits, starting in 2007/2008. Our best estimate of the total corporate tax revenue lost due to profit shifting is about 6 % in the last year of the sample, 2012. We estimate that the revenue loss would have been twice as large in absence of the new regulatory framework.

JEL classification: F23, H25, H26

Keywords: Multinational companies, profit shifting, BEPS, Transfer pricing, Tax gap

Corresponding author: Jarle Møen, NHH Department of Business and Management Science, Hellevevn. 30, 5045 Bergen, Norway. *E-mail:* jarle.moen@nhh.no, *Tel:* + 47 55 95 96 12

*We are grateful for useful comments and suggestions from Annette Alstadsæter, Richard Blundell, Aline Bütikofer, Tim Dowd, John Langli and Guttorm Schjelderup as well as participants at the Research Council of Norway's Forum on Taxation in 2019, Nordic Tax Research Council meeting in Reykjavik in 2016, the National Tax Association's Annual Conference in Boston in 2015 and seminar participants at ETH Zürich, NHH Norwegian School of Economics, NTNU Norwegian University of Science and Technology, the University of Augsburg and the University of Bergen. All views expressed and all remaining errors are the sole responsibility of the authors. The project is financed by the Research Council of Norway, Grant No. 267423. The Norwegian Center for Taxation also receives base funding from the Norwegian Tax Administration.

1 Introduction

The importance of multinational companies (MNCs) in the world economy is increasing. This is good for technology diffusion and growth, but MNCs can shift income from high-tax to low-tax countries, thus reducing the corporate tax base in high-tax countries. MNCs frequently use manipulation of prices on cross-border internal transactions and financing of affiliates in high-tax countries with internal debt to shift income. These practices have spurred a recent OECD initiative to curb base erosion and profit shifting (BEPS).

At first sight, there seems to be massive evidence that BEPS is a first order problem and that tax havens play a particularly destructive role. Large companies such as Google, Apple, and Starbucks, have received extensive media coverage for successful legal tax avoidance strategies, and many cases of illegal tax schemes have also been uncovered by tax authorities. However, the academic literature does not provide a unified answer as to how widespread profit shifting behavior is in the total population of firms; whether the overall welfare loss associated with such behavior is large; and whether the magnitude of the problem is increasing or decreasing.

We investigate the profitability differential between MNCs and domestic companies in Norway, a country with a corporate tax rate that is not particularly high and whose industry structure consists of many small firms. Having a 20-year-long panel of the entire population of firms, we are able to study what happens to taxable income for companies that shift from being domestic to being multinational and companies that shift from being multinational to being domestic. Due to the size of the dataset and the long time period covered, we can in many instances observe the same company changing its multinational status several times. This could be the case if the company is sold from a domestic to a multinational group or the opposite, or if the company itself invests or disinvests abroad. We also study how the observed profit differentials vary with the MNCs' scope for profit shifting – most notably their volume of cross border internal trade. Finally, we study the effect of the introduction of stricter transfer pricing regulations and an increase in the Norwegian tax authorities' effort to audit transfer pricing from 2007/08 onward.

Our main sample consists of 13,000 firms that change their status from domestic to multinational or the other way around over the years 1993-2012. These shifts constitute quasi experiments where we observe the same company with and without profit shifting opportunities in different years. With firm-fixed effects and a rich set of firm characteristics, we can control for potential confounding factors, and we can also control for changes in unobserved macroeconomic conditions by comparing the change in profitability for companies that change their status to companies that do not in the same period. In order to avoid that our estimates become biased by short-term dynamics and mean reversion problems, we use 'long differences' rather than 'short differences' when we estimate the change in profitability. More specifically, we remove observations from $t - 3$ through $t + 3$

for firms that change their MNC status in year t . Omitting seven years around the status shift is possible because of the very long panel.

We find that the return on total assets in financial report data drops by 2.0 percentage points when domestic firms become MNCs. This represents a drop in taxable income of about 24 %. Our estimates are about the same whether the firms become MNCs because they expand abroad or because they are acquired by foreign companies. Moreover, we find that the effects of shifts to and from being a multinational company are approximately symmetric.

The estimated effect on profitability and tax revenue is relatively large, but in line with the most recent findings in the literature. Bilicka (2019) is a notable example. She finds that the profitability reported by foreign controlled MNCs in the UK is half that of comparable domestic standalones.¹ Similarly, Tørsløv, Wier and Zucman (2018) compare profits booked by foreign and local firms in tax havens and non-havens using macroeconomic foreign affiliates statistics. They find that close to 40 % of multinationals' profits globally are shifted to tax havens. Also Clausing (2016), estimating the effect of profit shifting on corporate tax base erosion for the United States, finds that the problem is large and increasing. As discussed by Dharmapala (2019), these studies challenge the conclusion of Dharmapala (2014) who states that “in the more recent empirical literature, which uses new and richer sources of data, the estimated magnitude of BEPS is typically much smaller than that found in the earlier studies”.

We find that the difference between domestic and multinational companies increases with the amount of cross-border internal trade. The reduction in profits when firms become MNCs is partly explained by an increase in the share of intermediate goods in total costs and higher internal interest expenses. Our main findings are robust to using different performance measures, to changes in functional form and to using ‘short differences’ rather than ‘long differences’. In line with what one would expect if lower profitability is caused by income-shifting, we do not find significantly lower profitability for loss making firms, nor for firms with minority foreign ownership or minority ownership in foreign companies. Based on the sum of evidence, we attribute the estimated taxable income differential to the profit shifting opportunities that are available for MNCs.

We find that the extent of profit shifting increases from 1993 to 2007 and decreases thereafter. This shift coincides with an increase in the tax authorities' efforts to monitor transfer pricing, starting in 2007/08. Our results also suggest that firms targeted by the new policy reduced their profit shifting behavior, and thus that the new policy helped to curb transfer pricing activity.

Our findings suggest that the change in profitability is particularly large for medium

¹Another very recent contribution is Bustos, Pomeranz, Vila-Belda and Zuckman (2019) who give preliminary results from a similar study of firms in Chile. They, too, find a large difference in profitability between domestic and multinational firms.

size firms. This is consistent with some fixed costs in setting up profit shifting schemes and that variable concealment costs are increasing in firm size because the tax authorities monitor the transfer pricing of large firms most closely.²

We end the paper with a tax gap analysis and estimate that the overall lost corporate tax revenue due to profit shifting is about 6 % in the last year of the sample. This is similar to Tørsløv, Wier and Zucman (2018) who estimate that 8 % of the Norwegian corporate tax revenue is lost due to profit shifting, and to Alvarez-Martinez et al. (2018) who find that the corporate tax losses for the EU amounts to 7.7 % of the total corporate tax revenues. It is also in the same range as recent OECD estimates. OECD (2015, Action 11) summarizes work performed since 2013 and assesses that the global corporate income tax revenue loss is in the interval 4 % to 10 % of global revenues.

Each year, the Norwegian Tax Administration uncovers about a hundred cases of what they claim is manipulation of transfer prices and false invoicing between closely related companies. These cases alone represent about 0.6 % of total taxable corporate income. In light of this, our estimate might seem low, in particular since it includes legal tax avoidance in addition to illegal tax evasion. However, while the tax authorities are only concerned about income leaving Norway, our net estimate takes into account that income can be shifted into Norway. Our tax gap analysis also highlights the importance of the new and stricter regulations. If we calculate the potential 2012 tax gap using the difference between MNCs and domestic firms observed in the period just prior to the new regulations, we obtain an estimated tax gap of 13 %. Our findings in this respect are in line with Riedel, Zinn and Hofmann (2015) as well as Beer and Loeprick (2015). Both find that transfer pricing documentation rules reduce profit shifting by about 50 %.

The paper proceeds as follows: The next section reviews related literature. Section 3 gives an overview of the institutional setting. Section 4 presents the empirical specification and our data. Section 5 contains our main empirical analysis while Section 6 presents robustness tests. Section 7 provides a brief tax gap analysis and section 8 concludes.

2 Related literature

Our approach relates most closely to the literature started by Grubert, Goodspeed and Swenson (1993) who analyze the differential in the profitability of foreign-controlled and domestically controlled companies in the US. Controlling for a large number of potential factors, they conclude that the differential that is attributed to transfer pricing represents a 35 % reduction in taxable income.³ They also find that foreign controlled companies

²Transfer pricing filing requirements and transfer pricing documentation requirements only apply to large transaction volumes and large firms, see section 3.

³Grubert (1998, 2008) attributes a smaller share of the profit differential detected by Grubert, Goodspeed and Swenson (1993) to transfer pricing. Also Collins, Kemsley and Shackelford (1997) and Kinney and Lawrence (2000) question whether tax management can explain the differential unaccounted for in

have rates of returns that are heavily concentrated around zero, and that they tend to persist in this region. In the most recent addition to this literature, Bilicka (2019) develops the bunching idea further and finds similar evidence for UK firms. Moreover, Bilicka demonstrates that there are far more companies reporting exactly zero profit in tax returns data than in financial accounting data. This implies that profit shifting may be underreported in studies based on accounting data. Bilicka uses matching on observables as empirical strategy. She makes clear that her results are conditional on the assumption that unobserved firm characteristics do not affect the dependent variable and that she cannot directly test this assumption. In general, however, we should expect there to be unobserved differences between firms that are correlated with their multinational status, and such differences may potentially bias the results. Unobserved firm characteristics that give rise to permanent differences in profitability will represent a particular concern to the empirical strategy.⁴

Blouin, Collins and Shackelford (2005) criticize the Grubert et al. approach along these lines pointing out that an “inherent weakness ... is that shareholder domicile cannot be randomly assigned among firms.” In order to better isolate the influence of domicile on taxes they suggest a difference-in-differences approach and utilize data for 62 large US firms that were acquired in 1996.⁵ More specifically, they compare the corporate tax returns of 31 U.S.-domiciled companies before and after they are acquired by foreign firms to the corporate tax returns of 31 similar U.S.-domiciled companies before and after they are acquired by other U.S. firms. Using a difference-in-differences strategy implies that they account for unobserved firm characteristics that may affect profitability. Their results do not support claims that foreign acquisitions result in disproportionate tax reductions compared to domestic acquisitions.⁶

Grubert, Goodspeed and Swenson (1993). Other early papers in this literature include Oyelere and Emmanuel (1998) who find that foreign controlled companies in the UK report lower profitability than domestically controlled companies, while their dividends outstrip those of the domestically controlled. In a follow-up study, they explain the lower profitability partly by higher trading expenses in the foreign controlled companies (Oyelere and Emmanuel, 2002). Using Norwegian data and a similar approach, Langli and Saudagaran (2004) find that MNCs report lower profitability than the domestically controlled companies.

⁴It is likely that some domestic companies have long-lasting profitability advantages related to e.g. technology, quality of management or location. Affiliates of foreign companies, on the other hand, should typically earn a normal rate of return even if they exploit a competitive advantage. This is because the strategic asset that they are set up to exploit belongs to the mother company. A foreign affiliate should rightfully pay a royalty, licence or service fee to use the asset even in absence of profit shifting incentives. Bilicka acknowledges the potential for unobserved firm characteristics along another dimension, noting as a puzzle that she “cannot identify any major differences in the observable firm level characteristics between tax-payers and non tax-payers”. She suggests that this may be related to differences in unobservable characteristics such as ability to shift profits, reputational costs of aggressive tax planning or differences between the CEOs’ attitude to tax planning.

⁵Grubert, Goodspeed and Swenson (1993) present an analysis of acquisitions, but not a full before and after comparison of foreign and domestic acquisitions. This approach is, however, suggested in an accompanying comment to the paper by MacKie-Mason (1993).

⁶Studying European mergers and acquisitions, Belz, Robinson, Ruf and Steffens (2013) also find the tax effect of national and international takeovers to be of similar magnitude. However, they find that the

We take account of the critique by Blouin, Collins and Shackelford (2005) and use a fixed effects panel data estimator to control for unobserved firm specific effects in profitability that may be correlated with being an MNC. Compared to Blouin, Collins and Shackelford, we have a much longer panel with far more identifying observations and also much more variation in firm size. This allows us to both pre-screen the sample in order to base the analysis on comparable observations and to cancel out the potential for intermediate dynamics around the time when a firm becomes multinational. Importantly, our paper also adds to a small literature that evaluates the effect of transfer pricing regulation, see e.g Beer and Loeprick (2015), Riedel, Zinn and Hofmann (2015) and De Mooij and Liu (2017).

By linking differences in taxable income to firm characteristics conducive to transfer pricing manipulation, such as having a high level of cross-border internal trade, we also connect with the literature started by Grubert and Mutti (1991) and Hines and Rice (1994) studying how tax incentives affect profit shifting. In addition, we distinguish between domestic MNCs and purely domestic companies. In countries with a territorial tax regime such as Norway and most other OECD countries, only the latter group is unable to shift income across borders.⁷

A third strand of the literature compares transfer prices to third party prices directly.⁸ There are obvious advantages to having price data, but, importantly, the total extent of profit shifting cannot be estimated using this approach. This is because comparable arm's length prices on internal trade in services and intellectual property will never be observed. Exactly for this reason, trade in immaterial products is thought to be a more important vehicle for profit shifting than trade in physical products. Despite this limitation, Bernard, Jensen and Schott (2006) find that the prices US exporters set for their arm's length customers are on average 43 % higher than the related party price. For differentiated goods, the estimated price gap is even larger, and the gap varies systematically with the tax incentive. Their back-of-the-envelope calculations suggest that mispricing of internal trade led to a \$ 5.5 billion loss of U.S. corporate tax revenue in 2004.

Cristea and Nguyen (2016) point out that firms can also adjust their arm's length prices to conceal their transfer pricing manipulation and propose a triple difference method to counter the downward bias that this may cause. They find that Danish MNCs reduce the unit values of their exports to low tax countries in the range 5.7-9.1 %. In another recent contribution to this literature, Liu, Schmidt-Eisenlohr and Guo (2017) find that

increase in tax avoidance of targets post deal is driven by targets facing a higher statutory tax rate relative to their acquirer, and that the degree of tax aggressiveness of the acquiring firm plays an important role.

⁷Other pioneering studies in this strand of the literature include Harris, Morck, Slemrod and Yeung (1993) and Klassen, Lang and Wolfson (1993). More recent influential papers include Huizinga and Laeven (2008), Dharmapala (2014) who reviews the literature and, Dowd, Landefeld and Moore (2017) who show that prior estimates which ignore nonlinearities understate the extent of profit shifting.

⁸Early studies in this strand of the literature include Lall (1973), Bernard and Weiner (1990), Swenson (2001) and Clausing (2003).

transfer mispricing increases with a firm’s R&D intensity and that “tax-motivated transfer mispricing is concentrated in countries that are not tax havens and have low-to-medium-level corporate tax rates”.

While we compare the taxable income of MNCs and domestic companies, recent studies by Markle and Shackelford (2012) and Dyreng, Hanlon, Maydew and Thornock (2017) study effective tax rates (ETRs). Both Markle and Shackelford, and Dyreng, Hanlon, Maydew and Thornock find that ETRs have declined substantially over the last two decades. Neither paper, however, finds that there is a significant difference between the ETRs of MNCs and purely domestic firms. This finding is puzzling in light of the BEPS debate and the profit shifting literature. One way to reconcile their finding with the general perception that MNCs have an increasing cost advantage over purely domestic firms, is to think in terms of a general equilibrium model where investors demand the same after tax return on assets whether they invest in domestic or multinational firms. Firms with a high domestic tax burden and a large potential for profit shifting will then establish subsidiaries in low tax countries. Those that do not follow this strategy will either be out-competed or move to sectors where domestic tax planning opportunities and tax benefits are available. Such endogenous responses may explain both the sharp increase in the share of MNCs and the substantial decline in the average ETR experienced by both MNCs and purely domestic firms.

3 Institutional background⁹

Companies resident in Norway are in principle subject to corporation tax on worldwide profits and capital gains. Non-resident companies are subject to corporation tax on Norwegian sourced profits. Exemption applies to corporate shareholders for all investments within the European Economic Area (EEA). From 2008 onward, the exemption method only applies if the subsidiary abroad fulfills an additional substance requirement. The 2008 rule was established to curb profit shifting to low tax countries within the EEA. For investments outside the EEA, exemption only applies if the shareholder controls 10% or more of a foreign company and if the foreign tax is above 1/3 of the Norwegian tax that would have been due if the foreign company had been resident in Norway. A company is regarded as resident in Norway when it is incorporated under Norwegian law and registered in the Norwegian Registry of Business Enterprises, or if its central management and control is carried out in Norway.

Taxable income shall, to the extent possible, match actual company profits. The determination of taxable income is based on the results shown by the annual accounts,

⁹This section draws on Ministry of Finance (2011, 2014), OECD (2012, 2013) and KPMG (2014) in addition to annual reports from the transfer pricing team in the Norwegian Tax Administration 2009-2012 available at www.skatteetaten.no/no/Bedrift-og-organisasjon/Drive-bedrift/Aksjeselskap/Internprising/arsrapporter/. The 2011 report is available in English.

adjusted by legislation. As a general principle, all expenses incurred for the purpose of obtaining, maintaining or securing taxable income are deductible. The deduction of certain expenses is limited by legislation, including expenditure on donations and representation. Dividend distributions are not deductible for tax purposes.

Following a fundamental tax reform in 1992, company profits in Norway were taxed at a flat rate of 28 % until 2013.¹⁰ Losses can be carried forward and deducted from subsequent profits. After the Norwegian 1992 tax reform, the corporate tax rate was significantly below the average statutory corporate tax rate in both the OECD countries and the EU member states. Gradually, however, other countries also reduced their rates. In 2005 the Norwegian statutory corporate tax was about on par with the OECD and EU averages. Thereafter, the OECD and EU averages have been somewhat below the Norwegian rate.¹¹ The average ETR will be lower than the statutory tax rate if investments are tax relieved, for example through generous depreciation rules. According to Spengel, Endres, Finke and Heckemeyer (2014), the average ETR in Norway was about 26.5 % in the years 2005-2012 and the marginal ETR was 23.3 %. The downward trend in the OECD tax level implies that the incentive to shift profit to ordinary OECD countries has increased over time. The incentive to shift profit to tax havens has probably been stable.

Norway introduced more explicit transfer pricing regulations in 2007/08. Besides the substance requirement for exemption mentioned above, an explicit reference to the OECD transfer pricing guidelines was built into the the Tax Act and became effective for the fiscal year 2008. In addition, two transfer pricing documentation requirements were introduced in 2007. First, a special transfer pricing filing requirement implies a duty to file a separate form (RF-1123), in which the nature and scope of transactions and accounts outstanding with associated companies or entities are specified. RF-1123 shall be filed as an attachment to the annual tax return for firms that have a transaction volume with associated firms above NOK 10 million (approximately USD 1.25 million). Second, firms are required to submit special transfer pricing documentation upon request from the tax authorities. The documentation shall be retained for a minimum of ten years after the end of the income year. If requested, the documentation shall be submitted to the Tax Administration within 45 days. The documentation regulation applies to companies with more than 250 employees and sales above NOK 400 mill or total assets above NOK 350 mill. (The last two numbers correspond to approximately USD 50 and 44 million.)

The Norwegian Tax Administration also increased its auditing effort, and established an internal transfer pricing network in 2006. In 2008 a national transfer pricing team was established, and at the same time the largest regional tax administrations established their own transfer pricing units. In 2009 the Tax Administration started to issue annual reports

¹⁰Income from petroleum extraction was subject to a special tax of 50 % on top of the ordinary tax on profits. Our sample does not include companies subject to this tax.

¹¹The average tax rates in the EU and OECD were around 35 % and 37 %, respectively, in the first year of our sample and 23 % and 25 % in the last year of our sample.

on their transfer pricing control efforts. These reports show that they used 53 man-years on transfer pricing audits in 2009. This number increased gradually and was 87 in 2012. The Tax Administration reports that 114 cases of what they claim is manipulation of transfer prices and false invoicing between closely related companies were uncovered that year. These cases were very large and involved taxable income of about 7.2 billion NOK. This amounts to an increase in the corporate tax revenue in 2012 of about 2.4 %, or 0.6 % if including the revenue from tax on income from petroleum extraction in the base. 22 % of the added income was not disputed by the companies. In 42 more cases involving an additional taxable income of 8.0 billion NOK, the Tax Administration issued warnings about income that may be changed later. The average annual income added due to audits over the years 2009-2012 was 10.3 billion NOK.

4 Empirical specification and data

4.1 Empirical strategy

Our main specification is

$$\Pi_{it} = \beta_0 + \beta_1 MNC_{it} + X_{it}\gamma + \lambda_t + \alpha_i + \varepsilon_{it}$$

Profitability for firm i in year t , Π_{it} , is measured as taxable income in percentage of total assets from unconsolidated financial reports. The variable of main interest is MNC_{it} , which is a dummy variable denoting whether firm i belongs to a multinational group or not in year t . MNCs can either be foreign controlled (FMNC) or domestically controlled (DMNC). Without other control variables, the OLS estimate of β_1 will capture the average difference in profitability between MNCs and purely domestic companies. X_{it} is our set of control variables, and λ_t , α_i and ε_{it} are error components. We estimate λ_t by including year dummies that capture time effects. α_i are firm specific fixed effects which we control for using the within-groups estimator. In addition, most regressions include industry-year fixed effects. All monetary variables in the analysis are in fixed 1998 NOK.

The assumption that the change in MNC status is uncorrelated with the idiosyncratic errors, ε_{it} , is not innocuous, and implies that shocks to profitability do not systematically affect the probability of changing MNC status. We thus impose two restrictions on the dataset used in the analysis.

First, we secure comparable observations by studying only firms that change their status from being domestic to being multinational or the other way around. These shifts constitute quasi experiments where we observe the same company with and without profit shifting opportunities in different years. Obviously, restricting attention to firms that are observed both as MNCs and as purely domestic companies reduces the sample signifi-

cantly. Most of the firms we leave out, however, are relatively small domestic companies that most likely are very different from the MNCs.

Second, we take into account that if, e.g., temporary, positive profitability shocks stimulate domestic companies to expand abroad, we will underestimate profit shifting. Likewise, we will overestimate profit shifting if expansion abroad typically is followed by a period of temporarily low returns due to high investments and aggressive pricing strategies. If foreign MNCs tend to acquire troubled domestic companies in order to restructure them, we may also overestimate profit shifting, but, if foreign MNCs tend to acquire growth companies, we may underestimate profit shifting.¹² In order to avoid that our estimates become biased by such short-term dynamics and mean reversion problems, we use ‘long differences’ rather than ‘short differences’ when we estimate the change in profitability. More specifically, we remove observations from $t - 3$ through $t + 3$ for firms that change their MNC status in year t . Omitting seven years around the status shift is possible because we have a very long panel.

Relying on long differences is also beneficial because it reduces measurement error bias due to erroneous timing of shifts. Sometimes, changes in MNC status will be captured in the data by a lag due to slow updating of the registers we rely on. Such errors contaminate the treatment and control groups and bias the profit shifting coefficient towards zero.

4.2 Data and descriptive statistics

4.2.1 Main dataset 1993-2012

Our main dataset is constructed by combining several data bases for the years 1993-2012. Our profitability measure and control variables come from non-consolidated financial reports submitted to the governmental Register of Company Accounts in Brønnøysund and provided to us by Dun & Bradstreet (D&B). These are the same data that are supplied to Bureau van Dijk and included in the Amadeus database. Coverage increases over time, but for companies above the size threshold used in our analysis, we have quite comprehensive data even from the beginning of our sample period. D&B also collect information on ownership which we use to construct corporate groups.

Second, we have data on foreign ownership in Norwegian companies (inbound FDI) from the SIFON register compiled by Statistics Norway. In 2004, the Norwegian Tax Administration established a national ownership register which is shared with Statistics Norway and from about 2006 information about ultimate ownership and corporate groups should be close to perfect.

We use data on outbound FDI from two different sources to identify domestic MNCs. In the period 1993-2006, we use the Survey of Outward Foreign Direct Investment (FDI)

¹²See, e.g., Grubert, Goodspeed and Swenson (1993) and Grubert (1998) for a discussion. Balsvik and Haller (2009) find that foreign take-overs in Norway are most frequently directed at growth companies.

(*Utenlandsoppgaven*) which was jointly collected by the Norwegian Tax Administration and Statistics Norway. This joint data collection effort ended in 2006. After 2006, Statistics Norway have collected data on outward FDI from a new survey called “Investments Abroad”.¹³ Although this represents a break in the data series, we are able to combine the two sources to construct a coherent classification of domestic companies with affiliates abroad. We have reason to believe that both before and after 2006 there are companies with foreign affiliates that are not registered, however. Because of this uncertainty regarding the quality of the outbound FDI data, we classify firms that are multinational at two points, t and $t + s$ in these two datasets as MNCs also in the intervening years, even though they appear to be domestic in the raw data. Our results do not hinge on this modification, however.

The various data sources are merged using unique company identification numbers produced by Statistics Norway based on original organization numbers administered by the governmental Brønnøysund Register Centre.

We classify domestically controlled companies as MNCs (DMNC) if they belong to a corporate group where the ultimate mother company own, directly or indirectly, at least 50 % of a foreign affiliate. Companies where the largest ultimate owner is foreign and directly or indirectly controls at least 50 % of the shares, are defined as foreign controlled MNCs (FMNC).

4.2.2 Supplementary data 2006-2012

We have access to a shorter panel containing additional information from tax returns made available for research by the Norwegian Tax Administration. This dataset contains financial report variables and a classification of foreign and domestic MNCs similar to the main dataset. In addition, we have information about licensing costs and the number of related trading partners in Norway and abroad with a transaction volume above the cutoff that makes transfer pricing documentation required.¹⁴ The cutoff is trade with associated foreign or domestic partners of more than NOK 10 million during the income year (approximately USD 1.25 million). In addition, the dataset includes a dummy variable that marks companies where the manager is also chairman of the board. These companies typically have a managing owner, and such owners have an incentive to shift labor income to capital income which is taxed at a lower rate, see Alstadsæter and Wangen (2010) and Alstadsæter and Thorsen (2010). Although this is not our main focus, we want to control for such behavior to avoid bias. Unfortunately, the within firm variation in the variables of interest in this supplementary dataset is not sufficient to accommodate fixed

¹³The Norwegian Tax Administration also started to collect data on their own. Their new data series is based on the form “Controlled transactions and accounts outstanding” (form RF-1123). We use this source in the supplementing 2006-2012 dataset described in the next section.

¹⁴This information is collected in the form RF-1123.

effects estimation, but the extra variables enable us to explore whether the difference in profitability between purely domestic and multinational companies varies systematically with their scope for profit shifting.

4.2.3 Sample selection and trimming procedures

Firms in oil extraction, mining and financial industries are excluded. This is because the performance of firms in the financial sector is difficult to compare to other industries as their capital structure tends to be very different, and because the oil extraction and mining industries include almost no purely domestic companies that can be used as control companies. In addition, firms in oil extraction and financial industries are subject to special laws and regulations, including a separate tax scheme.

We perform some data trimming procedures in order to reduce problems with outliers, as summarized in Table 1. First, we restrict the sample to limited liability companies. Second, we exclude companies with average total assets below NOK 1,000,000 (approximately USD 125,000). Third, we exclude observations with non-positive sales. Fourth, we exclude observations with return on assets or with a profit margin outside the $\pm 100\%$ interval or a difference between taxable income and ‘net income before taxes’ of more than 50 % of sales. The latter restriction excludes observations with large changes in deferred tax liabilities and assets. Fifth, we exclude observations with short-term or long-term debt exceeding three times total assets.

The sample restrictions described so far leave us with 1,455,988 observations of which 6 % are MNCs. We will refer to this as the “full sample”. In the main analysis we make two more restrictions, as discussed in Section 4.1. First, we restrict the regression sample to firms that change their multinational status during the sample period. Since we have two different sources for outbound FDI, we impose the shift restriction separately on both sources. This way we avoid false shifts related to the break in the data series in 2006. Second, we remove observations from $t - 3$ through $t + 3$ for firms that change their MNC status in year t from our regression sample.

From the last line in Table 1, we see that our regression sample consists of 79,170 observations. These observations come from 12,813 firms. Even though every purely domestic firm in this sample is also observed as an MNC at some stage, only 25 % of the observations are of MNCs. This implies that the majority of the changes are observed in the latter half of our sample period, and shows that the speed of globalization has been increasing. Among the MNCs, about 75 % are affiliates of foreign controlled companies.

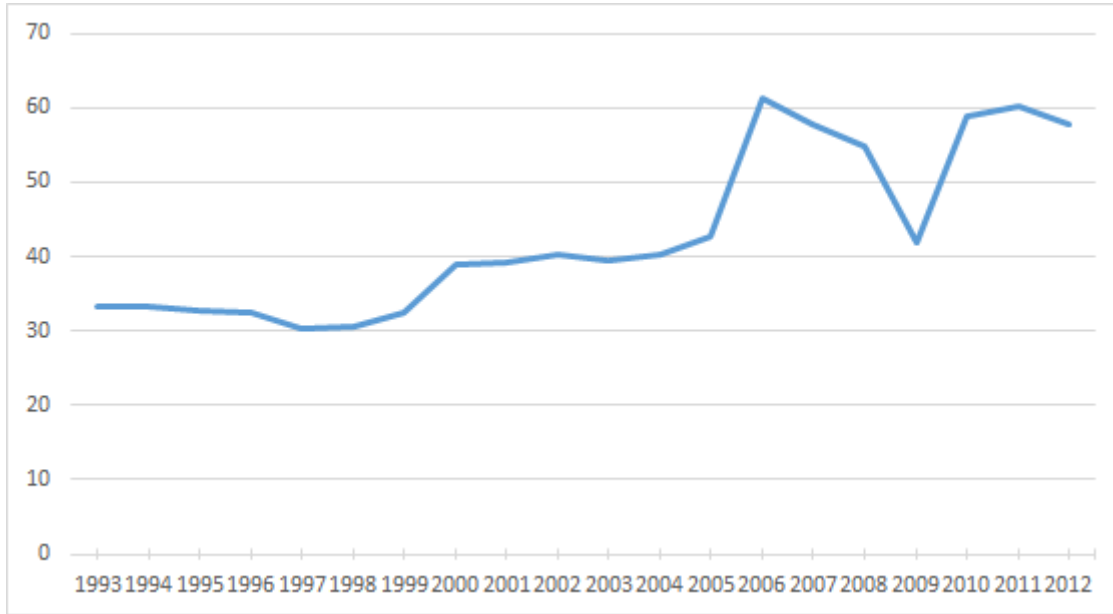
Figure 1 illustrates further the importance of MNCs in the Norwegian economy, using the full sample. In the early years roughly 30 % of the total income of firms operating in Norway was generated in firms classified as MNCs by our sources. From the late 1990s, this share increased steadily until 2005 when we observe a sharp increase followed by a significant decrease at the height of the financial crisis. In the last few years of the sample,

Table 1: Sample restrictions

	Total	MNC	FMNC	DMNC	Domestic
Original dataset	3,400,048	146,508	106,785	39,723	3,253,540
All industries except oil, mining, and finance	3,207,402	136,905	100,196	36,709	3,070,497
Limited liability companies	2,869,637	133,139	99,608	33,531	2,736,498
Mean total assets ≥ 1 mill NOK	1,910,885	114,335	82,440	31,895	1,796,550
Positive sales	1,657,124	94,706	69,343	25,363	1,562,418
$ TI/\text{total assets} < 1$, $ TI/\text{total income} < 1$ and $ (TI-NIBT)/\text{total income} > 0.5$	1,464,911	81,432	62,217	19,215	1,383,479
Debt ratios ≤ 3	1,455,998	80,745	61,622	19,123	1,375,253
Firms that shift status	158,143	59,456	42,288	17,168	98,687
Remove years around status shift ($t - 3$, through, $t + 3$)	79,170	19,994	15,527	4,467	59,176

The table displays the number of affiliate (i.e. firm) level observations after each sample restriction. The two main categories of firms are multinationals (MNC) and domestic, referred to as “purely domestic” in the text. Multinational companies are split into foreign controlled (FMNC) and domestically controlled (DMNC) based on the location of the ultimate majority owner. What we in the text refer to as the full sample, is the 1,455,998 observations before the two final restrictions in the last rows. The 79,170 observations left after the two final restrictions are what we refer to as the regression sample.

Figure 1: Total income of MNCs as percentage of total income for all firms



The graph is based on the full sample as described in Section 4.2.3.

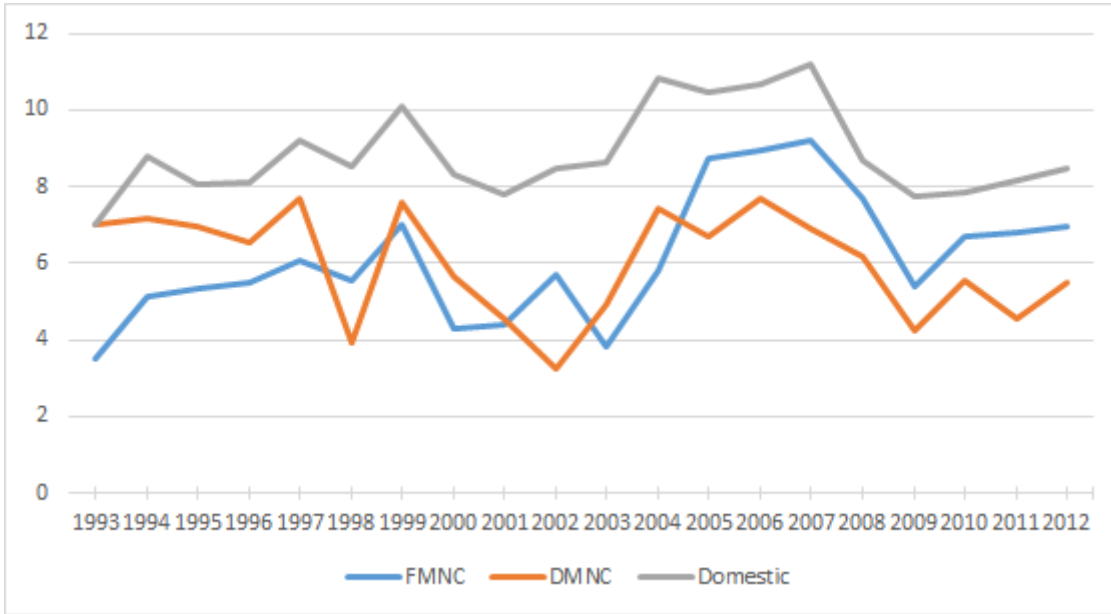
the percent of income in MNCs recovers to about 60. This is the level it had before the financial crisis. The substantial increase in this share over the period illustrates that MNCs are becoming increasingly important in a globalized world. Some of the sharp increase from 2005 to 2006 may also reflect improved classification of firms associated with the national ownership register that was established by the Norwegian Tax Administration in 2004.¹⁵ Aggregate statistics for inbound and outbound FDI, produced by Statistics Norway, however, confirm a sharp increase in globalization from 2004 onward, when the official series start. See Figure A1 in the Appendix.

In Figure 2 we take a first descriptive look at differences in return to assets, using the full sample. The figure displays the development over time for purely domestic firms, foreign controlled MNCs (FMNC) and domestically controlled MNCs (DMNC). We see that purely domestic firms always have higher profitability on average than either of the two categories of MNCs. There is no clear difference between DMNCs and FMNCs.

In Table 2 we present more detailed descriptive statistics on profitability for the firms in our regression sample. In Panel A we tabulate the averages, and see that domestic firms have an average return to assets of 8.50 % while MNCs have an average return to assets of 6.31 %, i.e. 2.19 percentage points or 26 % lower than that of domestic firms. We note that the average returns in the regression sample used in Table 2 correspond well with the averages displayed for the full sample in Figure 2. A formal t-test shows that the difference between MNCs and domestic companies is strongly significant in statistical terms. When we split the MNCs into foreign and domestically controlled, we see some

¹⁵Our results are robust to leaving out all firms that shift multinational status between 2005 and 2006.

Figure 2: Comparison of taxable income as percentage of total assets



The graphs are based on the full sample as described in Section 4.2.3.

indication that the foreign controlled are slightly more profitable.

In Table 2, Panel B, we look at various percentiles in the return distribution. As pointed out by Hopland, Lisowsky, Mardan, and Schindler (2018b), tax optimizing MNCs should have profits closer to break even than purely domestic companies, while it is less obvious what the distribution should look like for loss-making affiliates. In our data, positive profits are closer to zero for MNCs than for domestic companies, while the MNCs seem to have somewhat larger losses than domestic firms.

Table 2, Panel C, shows the share of observations that have positive taxable income. Again, we see a clear difference between purely domestic companies and MNCs, while there is little difference between the two categories of MNCs. The raw difference between domestic companies and MNCs is just above three percentage points.

4.2.4 Control variables

Our vector of control variables includes key characteristics that are commonly included in the earlier literature.¹⁶ We include the long-term and short-term interest-bearing debt as well as the short-term non-interest bearing-debt, all as shares of total assets. Since interest expenditure is tax deductible, we expect a negative effect from the interest-bearing debt, while the effect from non-interest-bearing debt is uncertain. Note that when including

¹⁶We draw in particular on Grubert, Goodspeed and Swenson (1993), Oyelere and Emmanuel (1998), Langli and Saudagaran (2004) and Grubert (1998, 2008). Descriptive statistics for the control variables are given in Appendix Table A1.

Table 2: Descriptive statistics for profitability

Panel A: Return to assets (%)	Total	MNC	FMNC	DMNC	Domestic
Mean	7.95	6.31	6.47	5.76	8.50
St.error	(19.66)	(19.10)	(19.97)	(15.68)	(19.82)
Panel B: Percentiles for return to assets (%)	Total	MNC	FMNC	DMNC	Domestic
10th percentile	-9.05	-11.08	-12.46	-7.63	-8.31
25th percentile	-0.11	-0.62	-0.68	-0.50	-0.02
50th percentile	5.31	4.54	4.80	3.77	5.56
75th percentile	16.59	14.99	15.90	12.26	17.18
90th percentile	30.94	27.71	29.07	23.05	32.04
Panel C: % of obs. with positive taxable profits	Total	MNC	FMNC	DMNC	Domestic
	72%	70%	70%	69%	73%
Observations	79,170	19,994	15,527	4,467	59,176

interest-bearing debt, we control for profit shifting related to internal loans.¹⁷ We control for tangibility by including the ratio of fixed assets to total assets in the regressions. There are two reasons why this is considered an important control variable. First, it can be easier for firms with a high tangibility ratio to obtain financing, as tangible (fixed) assets can be used as collateral when borrowing funds. Better investment opportunities thus suggest that we might expect a positive relationship between this ratio and profitability. However, since depreciation allowances reduce taxable income, the overall sign is ambiguous. Finally, we control for firm size by including sales up to the fourth power, and age by dividing age into five categories with corresponding dummy variables.

5 Main results

Table 3 reports our main results. Column (A) reports a simple specification having only an MNC dummy together with year and industry effects. The coefficient for the MNC dummy comes out as negative and large. MNCs are on average -3.9 percentage points less profitable than purely domestic companies and the difference is significant at the 1 % level. The coefficient is larger than the raw difference reported in Table 2. The specification reported in column (B) includes firm fixed effects, i.e., it utilizes only within-firm variation. We see that the coefficient is reduced substantially when we include firm fixed effects, but it is still highly significant both in statistical and economic terms.

In column (C) we extend the FE regression to include the full set of control variables

¹⁷Excluding interest-bearing debt as a control variable has little effect on the estimates. In their meta-analysis, Heckemeyer and Overesch (2017) find that transfer pricing and licensing are far more important profit shifting channels than inter-company debt.

described in section 4.2.4. We see that including control variables leads to an increase in the coefficient of interest, and that the return to total assets is reduced by 2.0 percentage points when purely domestic firms become MNCs. This represents a 24 % drop as compared to the mean return to assets of 8.5 % for purely domestic firms given in Table 2. We consider this our baseline estimate.

Grubert (1998, 2008) finds that firms with 25 % to 50 % foreign ownership exhibit similar levels of profitability as majority owned FMNCs. He points out that transfer pricing manipulation is less likely to be an explanation for the low profitability of these “non-controlled” companies because of the resistance by other shareholders. Hence, his findings for firms with foreign minority owners cast doubt on profit shifting as an explanation for the observed profit differential between domestically and foreign controlled companies. In order to explore this issue in our sample, we define a dummy variable for ‘25-50 % MNC’ which is one if a Norwegian company either has a foreign owner with an ownership share in this range or if a Norwegian company controls a share within this interval in a foreign company. The result of including this variable in our main regressions is presented in column (D). We see that the extra variable do not affect our main results and that the profitability of “minority MNCs” does not differ significantly from purely domestic companies.

In column (E) we split the MNC dummy into FMNCs and DMNCs. Interestingly, the coefficients suggest that both categories shift income roughly to the same extent, contradicting the finding in Dischinger, Knoll and Riedel (2014a, 2014b) on Amadeus data. They find that MNC headquarters are systematically more profitable than foreign subsidiaries, and that MNCs are reluctant to shift profits away from their headquarters even if these are located in high-tax countries.

In Column (F) we check whether the differences in profitability can be explained by systematic differences in risk, by using the squared residuals from the main regression in Column (C) as the dependent variable. If investments in affiliates of MNCs are systematically less risky than domestic companies, this could mean that investors demand lower returns to assets. However, our results indicate no significant differences in risk.

If what we observe is truly driven by profit shifting, and not by other factors that are systematically correlated with how firms change when they become multinational, reported profit should not only decrease when firms become multinational, but should also increase for those that cease to be multinational. So far, we have implicitly assumed that this symmetry holds but, in Figure 3, we put this assumption to the test. We do this by replacing the MNC dummy by a set of dummies that indicate not only the MNC status, but also the path to get there. For example, a firm might start out as domestic ($DC0 = 1$), then change to MNC ($MNC1 = 1$), then turn domestic again ($DC2 = 1$), become MNC once more ($MNC3 = 1$) and finally shift back to being domestic ($DC4 = 1$). If the firm starts as MNC, we may have the mirrored picture with $MNC0 = DC1 = MNC2 =$

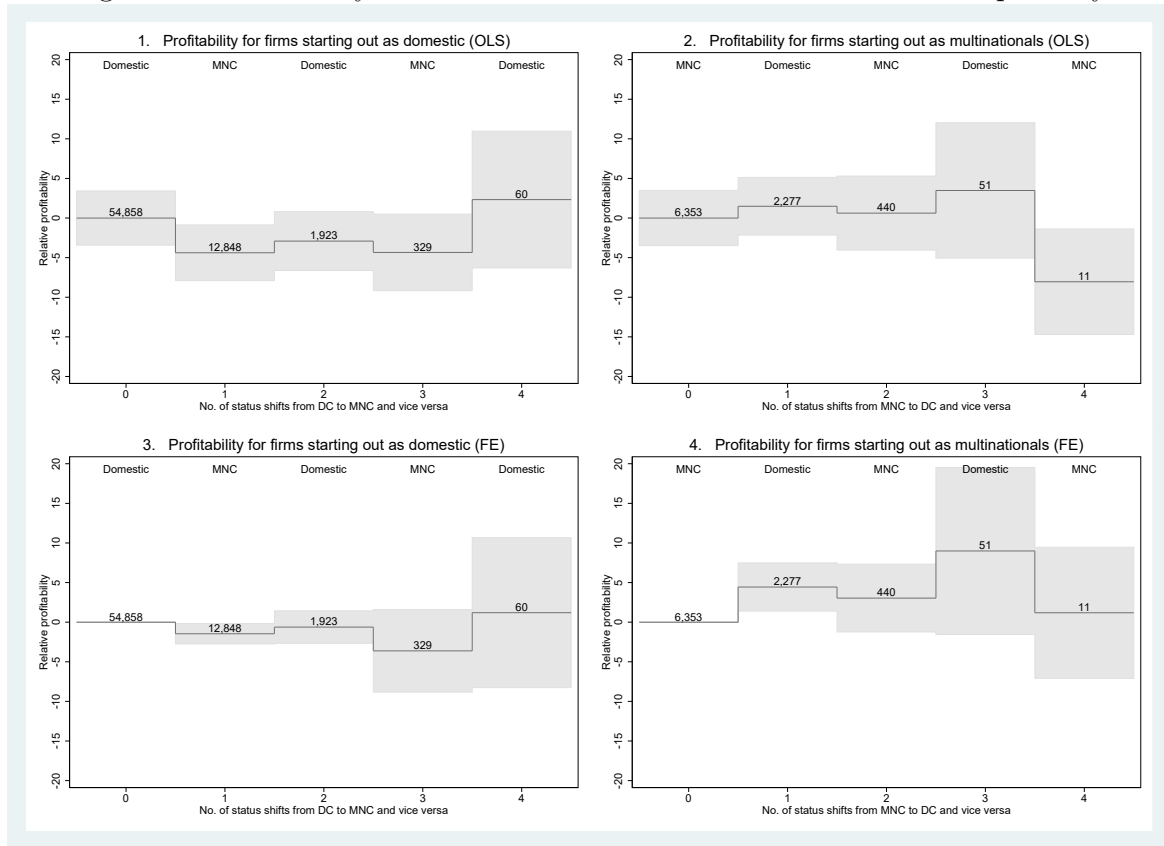
Table 3: Main regressions

Dependent variable	(A)	(B)	(C)	(D)	(E)	(F)
	Taxable income as % of total assets	Taxable income as % of total assets	Taxable income as % of total assets	Taxable income as % of total assets	Taxable income as % of total assets	Squared residual from column (C)
MNC	-3.851*** (0.315)	-1.671*** (0.543)	-2.043*** (0.522)	-2.038*** (0.521)		-22.62 (21.09)
MNC minority ownership (25-50 %)				0.187 (1.137)		
FMNC					-1.951*** (0.613)	
DMNC					-2.195*** (0.619)	
Long term debt/total assets			-21.10*** (0.808)	-21.10*** (0.808)	-21.11*** (0.808)	257.0*** (50.21)
Short term debt (w/interest)/total assets			-20.24*** (0.918)	-20.24*** (0.918)	-20.24*** (0.918)	566.2*** (52.95)
Short term debt (interest-free)/total assets			-11.28*** (0.777)	-11.28*** (0.777)	-11.28*** (0.777)	720.0*** (43.06)
Fixed assets/total assets			-6.582*** (0.641)	-6.581*** (0.641)	-6.584*** (0.642)	-203.3*** (34.12)
Total income/10 ¹⁰			98,931*** (11,350)	98,946*** (11,347)	99,106*** (11,367)	-468,050 (437,277)
Total income ² /10 ¹⁵			-1,353*** (282.7)	-1,353*** (282.5)	-1,356*** (283.1)	5,207 (9,541)
Total income ³ /10 ²²			635.1*** (189.4)	634.9*** (189.3)	636.3*** (189.7)	-1,758 (5,749)
Total income ⁴ /10 ³⁰			-912.8*** (327.7)	-912.4*** (327.5)	-914.4*** (328.1)	1,944 (9,505)
Age 0-5 years			1.609*** (0.613)	1.610*** (0.613)	1.611*** (0.613)	-28.91 (26.05)
Age 6-10 years			1.842*** (0.528)	1.842*** (0.527)	1.845*** (0.528)	-41.64* (22.19)
Age 11-20 years			0.982** (0.405)	0.982** (0.405)	0.986** (0.406)	-27.17 (16.75)
Observations	79,170	79,170	79,170	79,170	79,170	79,170
R-squared	0.024	0.012	0.076	0.076	0.076	0.031
Number of firms	12,813	12,813	12,813	12,813	12,813	12,813
Method	OLS	FE	FE	FE	FE	FE

Robust standard errors clustered on the firm level in parenthesis. Industry×year fixed effects are included, but not reported.

*** p<0.01, ** p<0.05, * p<0.1.

Figure 3: Profitability differences with each status shift modelled separately



The number of identifying observations behind each graphed regression coefficient is given above the respective line segments.

$DC3 = MNC4 = 1$. Because of the very low number of observations with more than four observed shifts, we limit this analysis to firms that have shifted up to four times. We have run OLS and FE regressions both for the case where we start with $DC0 = 1$ and for the case where we start with $MNC1 = 1$. In order to ease interpretation, we standardize the initial profitability to zero in all cases. We see from the figure that the data clearly supports our interpretation of the results in Table 3, as taxable income consistently shifts down as firms become MNCs and then bounce back when they return to domestic ownership. In Figures A2 and A3 in the appendix we investigate the robustness of our finding by splitting the sample into firms that shift exactly one, two, three, and four times. The pattern persists, although it becomes slightly less clear due to fewer observations behind each coefficient.¹⁸

The results presented so far are clearly consistent with cross-border profit shifting in MNCs, but the results cannot be taken as absolute proof of such behavior. For this reason, we devote Tables 4 to 7 to further inquiries.

The scope for profit shifting increases with the volume of internal transactions and is

¹⁸In a further robustness test we have restricted the sample to firms where we have at least one valid observation behind each line segment graphed, and the main pattern still persists.

typically thought to be larger for transactions related to intellectual property. In Table 4 we make use of supplementary data from the Norwegian Tax Administration to study whether the difference in profitability between domestic and multinational companies increases with the amount of cross-border internal trade. Our best available proxy for the volume of internal trade is a dummy variable which is one if a company has a transaction volume with at least one foreign affiliate that is above the cutoff that makes it necessary to file form RF-1123 (see section 3 and section 4.2.2). We have this variable from 2008 onward. Note that the filing requirement applies for domestic as well as cross-border trade.

Since the within variation in the variables of interest is limited in the supplementary data, we rely exclusively on OLS in this section and also omit the industry-specific time trends. Columns (A) and (C) are baseline regressions and include only the standard set of control variables. The coefficient indicates that MNCs on average have 3.4 or 2.9 percentage points lower profitability than domestic firms, depending on the number of years available for analysis. If the reduction in taxable income is driven by profit shifting, we should find firms reporting large internal transactions to be less profitable.¹⁹ In column (B) we see that this is indeed the case. MNCs that have internal transactions with foreign affiliates above the documentation cutoff have 2.3 percentage points lower profitability than other MNCs. Since an MNC below the cutoff is 3.1 percentage points less profitable than a domestic firm below the cutoff, a multinational above the cutoff is $3.1 + 2.3 = 5.4$ percentage points less profitable than a domestic firm below the cutoff. Interestingly, we see also that having internal transactions above the documentation cutoff with domestic affiliates does not reduce profitability.

Finally, we take into account the fact that domestically controlled firms with a managing owner have an incentive to shift labor income to capital income, which is taxed at a lower rate under the Norwegian dual tax system. If this practice is widespread, the low profitability of MNCs relative to purely domestic firms can be due to an artificially high return to assets in the comparison group of purely domestic firms. In order to explore this, we use a dummy variable that marks companies where the manager is also chairman of the board to proxy firms with managing owners. We see in column (D) that the coefficient does indeed come out as significantly positive both statistically and economically. This is consistent with labor income being shifted to capital income in these firms. However, the most important finding in our context is that controlling for the potential bias from this type of income shifting does not affect the estimated coefficient on the MNC dummy.

In Table 5 we present more evidence that is consistent with profit shifting. In Column

¹⁹Grubert (1998) performs a similar analysis based on US Form 5472, on which foreign-controlled companies report on transactions with offshore affiliates. He finds that foreign-controlled companies that buy more from offshore affiliates, particularly those in low-tax countries, have somewhat lower U.S. taxable income than those having more limited inter-firm involvement. His results on this account, however, are not very robust.

Table 4: Profit shifting incentives. OLS

	(A)	(B)	(C)	(D)
MNC	-3.367*** (0.430)	-3.063*** (0.451)	-2.886*** (0.384)	-2.444*** (0.397)
MNC*dummy for internal transactions with foreign affiliates		-2.253*** (0.667)		
Dummy for internal transactions with domestic affiliates		0.197 (0.482)		
Dummy for CEO and chairman being the same person in domestically controlled firms				2.268*** (0.576)
Observations	16,383	16,383	27,552	27,552
R-squared	0.079	0.080	0.084	0.085
Period	2008-2012	2008-2012	2007-2012	2007-2012

Robust standard errors clustered on firm level in parenthesis. Control variables, year and industry dummies, and a constant term are included, but not reported. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

(A) we test whether MNCs have lower taxable income because they have lower turnover than domestic firms. For this we use total income in percentage of total assets as our dependent variable. The coefficient is negative, but far from being significant at any conventional significance level. If firms shift income by paying too much for their imports, the share of materials in total costs should rise when a firm becomes multinational. This is exactly what we find in Column (B). Finally, if firms start to shift income by increasing internal debt, or charging too high interest rates on internal debt, the share of internal interest payments in total costs should rise, which we find in Column (C). Untabulated regressions indicate that total interest expenditures do not increase, however. Rather, it seems that firms shift from external to internal debt as they become multinational. Our findings in Table 5 are largely consistent with findings in a companion paper by Bakke (2015). Bakke uses a matching methodology combined with a difference-in-differences estimator and studies foreign acquisitions in Norway in the years 1994-2005. She finds a negative effect of foreign acquisitions on profitability, and that this negative effect is mainly driven by increased material costs. In terms of operating efficiency, liquidity, solvency, investments and sales growth, acquired firms do not seem to perform worse than comparable non-acquired firms.

In Table 6 we investigate size heterogeneity by splitting the sample into size quintiles based on size in the years the firms are observed as MNCs. We do it in this way in order to get the number of MNC observations evenly distributed. Looking at the total number of observations, we note that in general large firms must have become MNCs earlier than small firms since the total number of observations is more than halved from Column (A) to Column (E). The coefficient for the MNC dummy is negative in all specifications, but only significant for the four largest quintiles. Taken at face value, there seems to be a U-shape,

Table 5: The effect on turnover, material costs and interest expences. FE

	(A)	(B)	(C)
	Total income as percentage of total assets	Cost of materials as percentage of total costs	Internal interest payments as percentage of total costs
MNC	-0.603 (3.358)	2.009*** (0.578)	0.472*** (0.181)
Observations	79,170	79,170	52,578
R-squared	0.110	0.076	0.023
Number of firms	12,813	12,813	11,550

Robust standard errors clustered on firm level in parenthesis. Industry \times year fixed effects are included, but not reported. The number of observations is lower in column (C) due to some missing observations for the internal interest payment variable. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6: Regressions by size quintiles for MNCs. Dependent variable is taxable income as percentage of total assets. FE

	(A)	(B)	(C)	(D)	(E)
Size quintiles	0%-20%	20%-40%	40%-60%	60%-80%	80%-100%
MNC	-1.761 (1.221)	-4.097*** (1.245)	-4.030*** (1.119)	-3.907*** (1.186)	-1.897* (1.006)
Observations	22,736	18,528	15,283	12,310	10,313
Observations with MNC= 1	3,993	4,007	3,997	3,986	4,011
R-squared	0.109	0.124	0.138	0.132	0.092
Number of firms	4,494	3,006	2,195	1,694	1,424

Robust standard errors clustered on the firm level in parenthesis. Industry \times year fixed effects are included, but not reported. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

where medium sized firms are the most aggressive profit shifters. This is consistent with some fixed costs in setting up profit shifting schemes and with variable concealment costs that are increasing in firm size because the tax authorities monitor the transfer prices of large firms more closely.²⁰

In Table 7 we study how the differential between domestic firms and MNCs has developed over time, and in particular whether we observe changes that coincide with the new regulatory framework from 2007/08. In order to have as many shifts and observations as possible, we only exclude one year before and after status changes in this table.²¹ In Columns (A) and (B) we interact the MNC dummy with 5-year interval dummies, using OLS in Column (A) and fixed effects in Column (B). Both estimation techniques reveal the same pattern where we observe that the profit differential increases throughout the

²⁰Our results contrast those of Bilicka (2019) who studies UK multinationals and finds that the largest firms report the lowest taxable profits.

²¹We get very similar results if we use the main regression sample.

1990s and early 2000s, before it declines from 2008 onwards.²² In Column (C) we introduce a more crude time split, and contrast only the profit differential before and after 2007. The results indicate that while the difference between MNCs and domestic firms was about 2.3 percentage points in the period 1993-2007, the difference was cut by almost one half to about 1.2 percentage points in the period 2008-2012. A possible explanation for the increase in the first part of the sample period is continuous globalization with increased outsourcing and internal trade in both physical and immaterial goods as a result. Awareness of tax planning opportunities may also have increased. The decline from 2008 onwards coincides with the new regulations.

Column (D) consists of a rather complicated set of interactions with the aim of exploring the effect of the new regulations in 2008. To aid interpretation, we summarize these effects separately in Table 8. We consider firms that have been required to submit the form “RF-1123 Controlled transactions” at least once after its introduction in 2008 as affected by the new regulations. We label these, mostly large, firms, as ‘controlled firms’, and give them the value 1 on the dummy called ‘Controlled’.²³

We see that until 2007, the MNCs that later were controlled had a profitability that was -0.120 percentage points below that of other multinationals. This changed substantially in the period from 2008 onwards. For the controlled firms, the profitability *increased* by 1.228 percentage points in the period after the implementation of the new regulatory framework, while for the non-controlled firms, the profitability dropped by -0.688 percentage points. Consequently, the profitability differential between the two groups was reversed, with the non-controlled group being 1.796 percentage points less profitable than the controlled group in the last years. Taken together, this adds up to a total treatment effect of 1.916 percentage points.

If we interpret the differences in profitability as profit shifting, the results suggest that MNCs that were too small to be affected by the tax authorities’ new regime, increased their profit shifting, while those that had to submit the RF-1123 form at least once reduced their income shifting substantially. At first sight, this seems to contradict the finding from Column (B) in Table 4, where we found that firms reporting large international transactions in the form RF-1123 had particularly low taxable income. However, this effect is captured by the variables “MNC controlled in year t ” and “Domestic company controlled in year t ”. Consistent with the finding in Table 4, we see that in the years in which MNCs are actually controlled (in the sense that they have to file RF-1123), they do have substantially lower profitability. Our results thus suggest that while the MNCs that are affected by the new regime (i.e. they have filed RF-1123 at least once) have increased their profitability overall, they have lower taxable income in the specific years when their

²²Using annual interaction terms, we find that the decline is particularly strong from 2009 onwards.

²³Note that the term “controlled transaction” as used in RF-1123 does not imply that a transaction has been audited by the Tax Administration, but that one of the parties in the transaction has a controlling ownership stake in the other or that they are both controlled by a common owner.

Table 7: Effects of the new regulatory framework from 2008 onwards

	(A)	(B)	(C)	(D)
MNC			-2.277*** (0.373)	-2.176** (0.940)
MNC * 1993-1997	-2.985*** (0.406)	-0.477 (0.611)		
MNC * 1998-2002	-4.592*** (0.414)	-2.265*** (0.508)		
MNC * 2003-2007	-4.732*** (0.386)	-2.919*** (0.414)		
MNC * 2008-2012	-1.483*** (0.354)	-1.179*** (0.392)		
Controlled * 2008 onward				-2.094*** (0.573)
MNC * Controlled				-0.120 (1.023)
MNC * 2008 onward			1.230*** (0.459)	-0.688 (1.015)
MNC * Controlled * 2008 onward				3.322*** (1.156)
MNC controlled in year t				-2.226*** (0.671)
Domestic company controlled in year t				0.904* (0.501)
Observations	115,622	115,622	115,622	115,622
R-squared	0.107	0.078	0.077	0.078
Number of firms	15,867	15,867	15,867	15,867
Method	OLS	FE	FE	FE

Robust standard errors clustered on the firm level in parenthesis. Industry \times year fixed effects are included, but not reported. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

internal trade is above the RF-1123 filing threshold.

Overall, the results are consistent with profit shifting being increasing in the extent of international internal trade, but with the new regulatory framework having a disciplinary effect on the large firms that are affected by it. Even though our results suggest that the new regulatory framework is working as intended, the results also highlight that it is important to actually audit MNCs with large internal transactions. Moreover, the government should pay more attention to firms that are below the RF-1123 threshold, and consider stricter regulations also for these. One possibility could be to implement a second threshold that is related to internal transactions relative to total turnover, in addition to the current threshold that only considers the absolute level of internal trade and firm size.

Table 8: Effects of the new regulatory framework. Summary from 2008 onwards

	Non-controlled MNCs	Controlled MNCs	Difference (controlled - non-controlled)
Until 2007	-2.176	$-2.176 - 0.120 = -2.296$	-0.120
After 2007	$-2.176 - 0.688 = -2.864$	$-2.176 - 0.120 - 2.094 + 3.322 = -1.068$	1.796
Difference (after - before)	-0.688	1.228	1.916

Table 9: Are results driven by loss making firms or firms that have the same status in almost the whole sample period? Dependent variable is taxable income as percentage of total assets

	(A) Baseline	(B) Omit loss making observations	(C) Only loss making observations	(D) Firms observed at least 5 years as MNC and domestic
MNC	-2.043*** (0.522)	-1.604*** (0.442)	0.0447 (0.856)	-2.997*** (0.705)
Observations	79,170	57,399	21,771	28,095
R-squared	0.076	0.062	0.114	0.078
Number of firms	12,813	11,344	8,378	4,079
Method	FE	FE	FE	FE

Robust standard errors clustered on the firm level in parenthesis. Industry \times year fixed effects are included, but not reported. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6 Robustness tests

In Table 9, we conduct two robustness tests. First, we acknowledge that a substantial part of our observations is of firms that incur losses (28 % in our main regression sample). Hopland, Lisowsky, Mardan and Schindler (2018a,b) discuss how the incentives for profit shifting are reversed when affiliates of MNCs incur losses. Hence, if our results are driven by loss-making affiliates, our results can almost certainly not be attributed to profit shifting. We therefore rerun the main regression, first without loss making firms, and then on a sample consisting only off loss making firms. The results are reported in column (A) and (B) respectively. We see that we obtain a result that is quite similar to the baseline when we omit loss-making affiliates, while we get a coefficient very close to zero when we only include loss makers. This is as expected and implies that our results are not driven by loss-making affiliates.

Second, we address a potential worry that our results may be driven by firms that are domestic or MNCs in almost the whole sample period. Hence, in Column (D) we restrict the sample to firms that are observed for at least five years as purely domestic and at least five years as MNCs. We see that even though this reduces the sample substantially, the effect not only remains, but actually increases.

In order to avoid potential biases from temporary dynamics around the shifts and classification errors from possible lags in the updating of the ownership registers, we removed observations from $t - 3$ through $t + 3$ for firms that change MNC status in year t in the main analysis. We now explore the sensitivity of the results to this choice. Removing fewer years around the status introduces additional identifying shifts, but comes at the cost of potential selection problems and additional measurement errors that are likely to attenuate our results.

In Table 10, we see that when moving from our baseline result in column (A), to column (B) where we only exclude the year of the status change and one year before and one year after, the coefficient is reduced as expected, but the difference is not dramatic and the coefficient is still significant at the 1 % level. This is particularly important, since we have already used this increased sample in some of the analysis above. In Column (C), we do not exclude any years. In absence of errors with respect to the timing of the shifts, MNCs will on average have had half a year to shift profit in year t . We observe that including this year reduces the coefficient further, but that it is still significant at the 1 % level. Hence, we may safely conclude that our results do not critically depend on the fact that we have dropped several years with observations around the status shifts. In column (D), we explicitly explore the profitability dynamics by including dummies for the years around the status shifts. We see that the main coefficient is robust to this specification change and that the profitability of firms that become multinational starts to decrease already before the shift. This is consistent with a delay in the registration of multinational status for some firms, and this measurement error problem is one of the reasons for leaving out the years around the status shifts in the main specification.²⁴ The observed pattern is also consistent with acquisitions being caused by negative profitability shocks.

Finally, we acknowledge that performance can be measured in various ways and that it is not obvious which performance measure is the most relevant for our purposes. In Table 11 we estimate our model using three alternative measures of profitability.²⁵

Our baseline is taxable income scaled by total assets. Grubert, Goodspeed and Swenson (1993) argue in favor of this measure because conceptually it is expected returns on assets that should be equalized across investments. Grubert (1998), however, scales taxable income by sales and notes that sales have an advantage as a capital proxy in that they are not subject to the valuation problems associated with the book values that appear on corporate balance sheets. In column (B) we scale with total income (sales) rather than total assets. We observe that the effect is somewhat smaller compared to the baseline results, but still clearly negative and significant. In column (C) we use operating result

²⁴Note that this interpretation is only relevant for firms that shift from domestic to multinational status, but as can be seen from Figure 3, this is by far the most common direction of the shifts.

²⁵Descriptive statistics for the alternative measures of profitability are given in Appendix Table A2.

Table 10: Sensitivity to omitting years around status shift. Dependent variable is taxable income as percent of total assets. FE

	(A) Baseline	(B) $t - 1$ to $t + 1$ omitted	(C) No years omitted	(D) Include dummies for years around status shifts
MNC	-2.043*** (0.522)	-1.742*** (0.304)	-1.405*** (0.163)	-1.506*** (0.176)
Dummy for				
Three years before shift				-0.217 (0.170)
Two years before shift				-0.521*** (0.168)
One year before shift				-0.688*** (0.168)
Year of shift				-0.231 (0.181)
One year after shift				-0.0311 (0.182)
Two years after shift				0.000629 (0.187)
Three years after shift				-0.351* (0.199)
Observations	79,170	115,622	158,143	153,939
R-squared	0.076	0.077	0.079	0.078
Number of firms	12,813	15,867	17,531	17,342

Robust standard errors clustered on the firm level in parenthesis. Industry \times year fixed effects are included, but not reported. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 11: Alternative measures of profitability (%). FE

	(A)	(B)	(C)	(D)	(E)
	Baseline	TI/tot.inc.	Op.res./tot.ass.	EBITDA/tot.ass.	ln(TI)
MNC	-2.043*** (0.522)	-1.361** (0.568)	-1.950*** (0.553)	-1.510** (0.612)	-0.193* (0.0989)
Observations	79,170	79,170	79,170	79,170	57,047
R-squared	0.076	0.055	0.059	0.053	0.062
Number of firms	12,813	12,813	12,813	12,813	11,301

Robust standard errors clustered on the firm level in parenthesis. Industry×year fixed effects are included, but not reported. *** p<0.01, ** p<0.05, * p<0.1.

rather than taxable income in order to avoid potential systematic differences between firms domestic and MNCs with respect to receipt or payment of dividends, interest, and royalties. This hardly changes the coefficient. Finally, in column (D) we use EBITDA (earnings before interest, tax, depreciation and amortization) in the numerator, and see that our main finding is still robust. In column (E) we replace return on assets by log taxable income as dependent variable, thus using the same functional form as is common in the literature following Hines and Rice (1994). When including log total assets as a control variable, the MNC coefficient gives the percentage change in taxable income for a given level of total assets directly. We see that profit is reduced by 19 % when firms become MNCs. This corresponds well with the 24 % we calculated based on our baseline regression. With this specification the coefficient on log total assets is close to unity, suggesting that taxable income grows proportionally with total assets as one would expect. Log taxable income is missing for observations with non-positive profit, but the results are very similar if these are included with log taxable income set to zero.

7 Tax gap analysis

For policy purposes, a central question is what our results imply in terms of lost tax revenues. Before calculating this, we must consider to what extent our results can be generalized. Since our main sample consists only of firms that change their status, we do not use any information about firms that are multinational throughout the sample period. The income differential between these firms and domestic firms is not identified when using fixed effects estimation. In Table 12, we compare permanent MNCs to companies that change their status, using only the years in which the latter group is domestic, and then estimate the taxable income differential using OLS. We see that the coefficient for the MNC-dummy in column (A) is quite similar to the corresponding OLS-estimate in Table

Table 12: Permanent MNCs vs companies that change their status, using only the years in which the latter group is domestic. Dependent variable is taxable income as percentage of total assets. OLS

	(A)	(B)
MNC	-3.293*** (0.233)	-3.301*** (0.221)
Permanent MNCs	-0.338 (0.493)	0.289 (0.471)
Observations	132,142	132,142
R-squared	0.021	0.108
Control variables	No	Yes

Robust standard errors (clustered at the firm level) in parenthesis.

Year and industry dummies, industry×year fixed effects, and a constant term (not reported) included.

*** p<0.01, ** p<0.05, * p<0.1.

3.²⁶ This lends support to the interpretation of our FE regressions as having out of sample relevance and to using them for overall tax gap analyses.

In order to calculate the overall tax gap we construct a counterfactual profit for all MNCs in the last year of the full regression sample *as if* they were domestic. We do this using the MNC coefficients in Table 7, column (B). We measure the tax gap as the sum of the difference between the factual and the counterfactual profit for MNCs in percentage of the sum of total profits including the counterfactual MNC profit. Using the MNC estimate for the latest period, 2008-2012, we find that the gap for 2012 was 6 % of total profits. Using instead the MNC estimate from the period before new regulations to curb profit shifting came into force in 2007/08 (i.e. using the coefficient for the period 2003-2007), we find that the tax gap for 2012 would have been as high as 13 %.

8 Concluding remarks

We have estimated the taxable income differential between multinational and purely domestic companies in Norway, controlling for observable and unobservable firm characteristics. We find that taxable income declines by more than two percentage points when purely domestic companies become multinational. We attribute this to profit shifting behavior and estimate that about 6 % of the corporate tax revenue in Norway is lost each year. This estimate includes both legal tax avoidance and illegal tax evasion. Stricter transfer pricing rules introduced in 2007/08 and followed up by more resources devoted to transfer pricing audits by the Tax Administration coincide with a reduction in the profit

²⁶Although not reported due to space constraints, adding control variables to the the OLS regression in Table 3 also gives an MNC-coefficient that compares well with Table 12, column (B).

differential. If MNCs had shifted income to the same extent in 2012 as they did just before the new regulations came into force, our estimates suggest that 13 % of the tax revenue would have been lost in that year. Hence, the potential for increased tax revenue, using a combination of stricter transfer pricing rules and more monitoring, seems to be substantial.

At a more detailed level, our results suggests that medium sized firms are the most aggressive profit shifters and should be considered for closer scrutiny. One possibility could be to implement a reporting threshold that is related to internal transactions relative to total turnover, in addition to the current threshold that only considers the absolute level of internal trade and firm size.

References

Alstadsæter, A. and Thor O. Thoresen (2010). Shifts in organizational form under a dual income tax system. *FinanzArchiv*, **66**(4), 384-418.

Alstadsæter, Annette and Knut Reidar Wangen, (2010). Small Corporations' Income Shifting through Choice of Ownership Structure - a Norwegian Case. *Finnish Economic Papers*, **23**(2), 73-87.

Alvarez-Martinez, Maria T., Salvador Barrios, Diego d'Andria, Maria Gesualdo, Gaetan Nicodeme and Jonathan Pycroft (2018). How Large is the Corporate Tax Base Erosion and Profit Shifting? A General Equilibrium Approach. CEPR Discussion Papers No 12637.

Bakke, Julia Tropina (2015). The effect of foreign acquisitions on performance of firms in Norway: Profit shifting or real economic effects? Mimeo, Norwegian School of Economics.

Balsvik, Ragnhild, Stefanie A. Haller (2010). Picking "lemons" or picking "cherries"? Domestic and foreign acquisitions in Norwegian manufacturing. *Scandinavian Journal of Economics*, **112**(2), 361–387.

Beer, Sebastian and Jan Loeprick (2015): Profit shifting: drivers of transfer (mis)pricing and the potential of countermeasures. *International Tax and Public Finance*, **22**(3), 426-451.

Belz, Thomas, Leslie Robinson, Martin Ruf and Christian Steffens (2013). Tax avoidance as a driver of mergers and acquisitions. Mimeo.

Bernard, Andrew B., J. Bradford Jensen, and Peter K. Schott (2006). Transfer Pricing by US-based Multinational Firms. NBER Working Paper No. 12493.

Bernard, Jean-Thomas and Robert J. Weiner (1990). Multinational corporations, transfer prices and taxes: Evidence from the US petroleum industry. In A. Razin and J. Slemrod (eds.), *Taxation in the Global Economy*, University of Chicago Press, 123-154.

Bilicka, Katarzyna Anna (2019). Comparing UK Tax Returns of Foreign Multinationals to Matched Domestic Firms. *American Economic Review*, **109**(8), 2921-2953.

Blouin, Jennifer L., Julie H. Collins and Douglas A. Shackelford (2005). Does Acquisition by Non-U.S. Shareholders Cause U.S. Firms to Pay Less Tax? *Journal of the American Taxation Association*, **27**(1), 25-38.

Bustos, Sebastian, Dina Pomeranz, Jose Vila-Belda and Gabriel Zuckman (2019). Challenges of Monitoring Tax Compliance by Multinational Firms: Evidence from Chile. *AEA Papers & Proceedings*, **109**, 500-505.

Clausing, Kimberly A. (2003). Tax-motivated transfer-pricing on intra-firm trade, *Journal of Public Economics*, **87**(9-10), 2207-2223.

Collins, Julie, Deen Kemsley, and Douglas Shackelford (1997). Transfer pricing and the persistent zero taxable income of foreign-controlled U.S. corporations. *Journal of the American Taxation Association*, **19** Supplement, 68-83.

Cristea, Anca D. and Daniel X. Nguyen (2016). Transfer pricing by multinational firms: new evidence from foreign firm ownerships. *American Economic Journal: Economic Policy*, **8**(3), 170-202.

De Moij, Ruud and Li Liu (2017). At a cost: the Real Effect of Transfer Pricing Regulations on Multinational Investment. Mimeo.

Dharmapala, Dhammika (2014). What Do We Know About Base Erosion and Profit Shifting? A Review of the Empirical Literature. *Fiscal Studies*, **35**(4), 421-448.

Dharmapala, Dhammika (2019). Profit Shifting in a Globalized World. *AEA Papers & Proceedings*, **109**, 488-492.

Dischinger, M., Budo Knoll, and Nadine Riedel (2014a). There's no place like home:

the profitability gap between headquarters and their foreign subsidiaries. *Journal of Economics and Management Strategy*, **23**(2), 369-395.

Dischinger, Matthias, Bodo Knoll and Nadine Riedel (2014b). The role of headquarters in multinational profit shifting strategies. *International Tax and Public Finance*, **21**(2), 248-271.

Dowd, Tim, Paul Landefeld and Anne Moore (2017). Profit shifting of U.S. multinationals. *Journal of Public Economics*, **148**(1), 1-13.

Dyreng, Scott, Michelle Hanlon, Edward L. Maydew, and Jacob R. Thornock (2017). Changes in Corporate Effective Tax Rates Over the Past 25 Years. *Journal of Financial Economics*, **124**(3), 441-463.

Grubert, Harry (1998). Another look at the low taxable income of foreign-controlled corporations in the United States. Proceedings. Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association, 91, 157-175.

Grubert, Harry (2008). Debt and Profitability of Foreign-Controlled Domestic Corporations in the United States. OTA Technical Working Paper No 1., US Department of the Treasury, Washington DC.

Grubert H., Timothy Goodspeed, and Deborah L. Swenson (1993). Explaining the low taxable income of foreign controlled companies in the United States. In A. Giovannini, R. G. Hubbard and J. Slemrod (eds.) *Studies in International Taxation*, University of Chicago Press, 237-70.

Grubert, Harry and John Mutti (1991). Taxes, tariffs and transfer pricing in multinational corporate decision making. *Review of Economics and Statistics*, **73**(2), 285-93.

Harris, David, Randall Morck, Joel Slemrod, and Bernard Yeung (1993). Income shifting in US multinational corporations. In A. Giovannini, R. G. Hubbard and J. Slemrod (eds.) *Studies in International Taxation*, University of Chicago Press, 277-307.

Heckemeyer, Jost H. and Michael Overesch (2017). Multinationals' profit response to tax differentials: Effect size and shifting channels. *Canadian Journal of Economics*, **50**(4), 965-994.

Hines, James R. and Eric M. Rice (1994). Fiscal Paradise: Foreign Tax Havens and

American Business. *Quarterly Journal of Economics*, **109**(1), 149-82.

Hopland, Arnt O., Petro Lisowsky, Mohammed Mardan, and Dirk Schindler (2018a). Flexibility in income shifting under losses. *The Accounting Review*, **93**(3), 163-183.

Hopland, Arnt O., Petro Lisowsky, Mohammed Mardan, and Dirk Schindler (2018b). Implications of losses for multinationals' income shifting. Working paper.

Huizinga, Harry and Luc Laeven (2008). International profit shifting within multinationals: A multi-country perspective. *Journal of Public Economics*, **92**(5-6), 1164–1182.

Kinney, Michael and Janice Lawrence (2000). An Analysis of the Relative U.S. Tax Burden of U.S. Corporations Having Substantial Foreign Ownership. *National Tax Journal*, **53**(1), 9-22.

Klassen, Ken, Mark Lang, and Mark Wolfson (1993). Geographic Income Shifting by Multinational Corporations in Response to Tax Rate Changes. *Journal of Accounting Research*, **31**, 141-173.

KPMG (2014). Tax Facts Norway 2014, A survey of the Norwegian Tax System. Oslo.

Lall, Sanjaya (1973). Transfer-Pricing by Multinational Manufacturing Firms. *Oxford Bulletin of Economics and Statistics*, **35**(3), 173-195.

Langli, John Christian and Shabrokh M. Saudagaran (2004). Taxable Income Differences Between Foreign and Domestic Controlled Corporations in Norway. *European Accounting Review*, **13**(4), 713-741.

Liu, Li, Tim Schmidt-Eisenlohr and Dongxian Guo (2017). International Transfer Pricing and Tax Avoidance: Evidence from Linked Trade-Tax Statistics in the UK. CESifo Working Paper No. 6594.

MacKie-Mason, Jeffrey (1993). Comment. In A. Giovannini, R. G. Hubbard and J. Slemrod (eds.) *Studies in International Taxation*, University of Chicago Press, 270-75.

Markle, Kevin S. and Douglas A. Shackelford (2012). Cross country comparisons of corporate income taxes. *National Tax Journal*, **65**(3), 493–528.

Ministry of Finance (2011). Evaluation of the 2006 Tax Reform. Report No. 11 to

the Storting 2010-2011, Oslo.

Ministry of Finance (2014). The Norwegian tax system - main features and developments, Chapter 2 of the budget proposal on taxes 2015, Oslo.

OECD (2012). Transfer Pricing Country Profile Norway. Available at www.oecd.org/tax/transfer-pricing/.

OECD (2013). Addressing base erosion and profit shifting. OECD Publishing.

OECD (2015). OECD/G20 Base Erosion and Profit Shifting Project Executive Summaries 2015 Final Reports. OECD.

Oyelere, Peter B. and Clive R. Emmanuel (1998). International transfer pricing and income shifting: Evidence from the UK. *European Accounting Review*, **7**(4), 623-635.

Oyelere, Peter B. and Clive R. Emmanuel (2002). Differences in the reported performances of foreign-controlled and domestically-controlled firms: some U.K. evidence. *Journal of International Accounting, Auditing and Taxation*, **11**(1), 1-17.

Riedel, Nadine, Theresa Zinn and Patricia Hofmann (2015). Do Transfer Pricing Laws Limit International Income Shifting? Evidence from Europe. Mimeo.

Spengel, Christoph, Dieter Endres, Katharina Finke and Jost Heckemeyer (2014). Effective tax levels using the Devereux/Griffith methodology. Project for the EU Commission TAXUD/2013/CC/120, Final report, ZEW Mannheim.

Swenson, Deborah L. (2001). Tax reforms and evidence of transfer pricing. *National Tax Journal*, **54**(1), 7-25.

Tørsløv, Thomas R., Ludvig S. Wier and Gabriel Zucman (2018). The Missing Profits of Nations. NBER Working Paper No. 24701. Cambridge MA.

Appendix

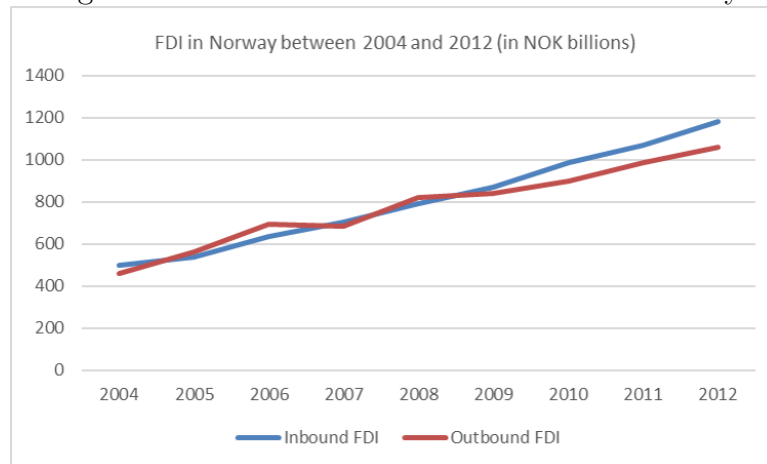
Table A1: Descriptive statistics, key characteristics

	Total	MNC	Domestic
Total income	106,427 (585,139)	210,119 (964,890)	71,393 (372,370)
Fixed assets/TA	0.20 (0.30)	0.12 (0.24)	0.23 (0.32)
Long term debt (int.)/TA	0.22 (0.31)	0.15 (0.28)	0.24 (0.31)
Short term debt (int.)/TA	0.08 (0.19)	0.12 (0.23)	0.07 (0.16)
Short term debt (non-int.)/TA	0.42 (0.30)	0.42 (0.30)	0.42 (0.30)
Age	13.87 (15.53)	16.71 (15.11)	12.91 (15.56)
Observations	79,170	19,994	59,176

Table A2: Descriptive statistics, alternative measures of profitability

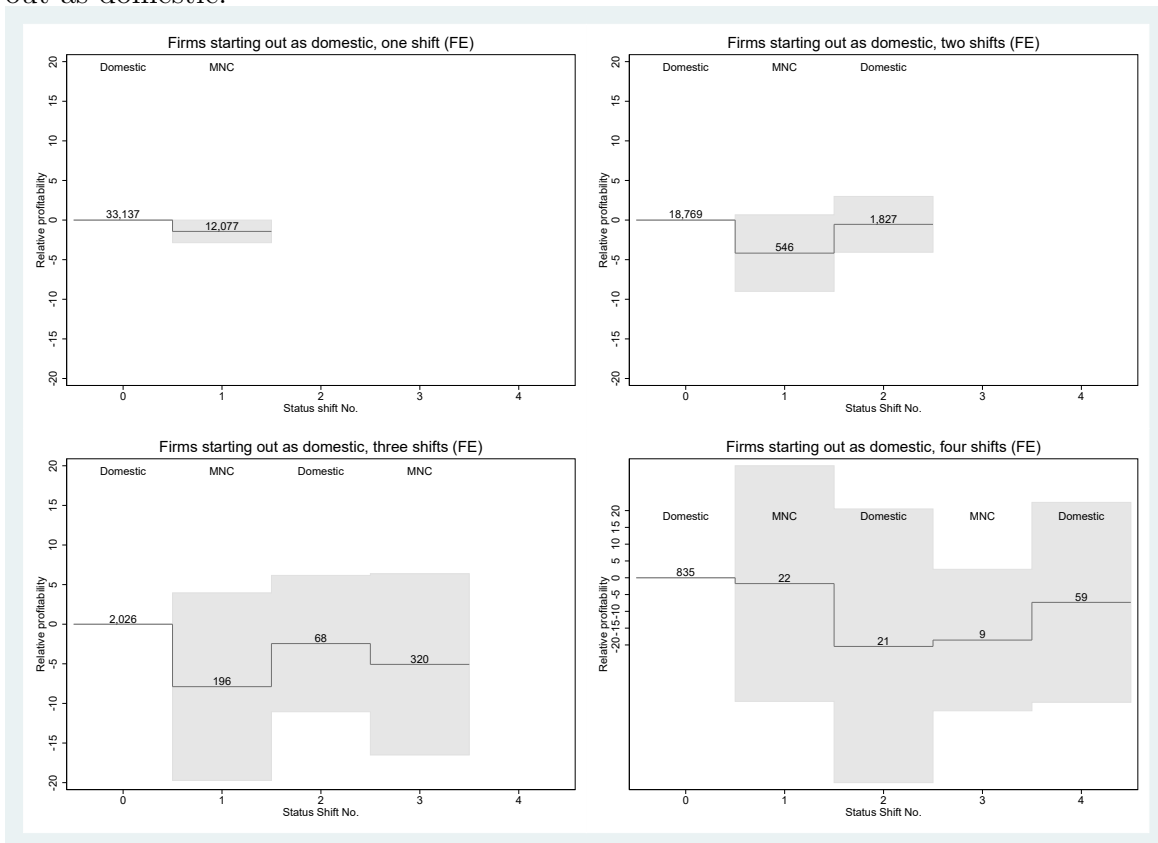
	Total	MNC	Domestic
Taxable income/total income (%)	7.30 (23.06)	5.30 (20.33)	7.97 (23.88)
Observations	79,170	19,994	59,176
Operating profits/total assets (%)	8.77 (23.25)	6.75 (20.76)	9.45 (23.99)
Observations	79,170	19,994	59,176
EBITDA/total assets (%)	13.45 (21.28)	11.54 (22.20)	14.09 (20.93)
Observations	79,170	19,994	59,176
Logarithm of taxable income	6.53 (3.52)	7.09 (3.73)	6.35 (3.43)
Observations	57,047	13,946	43,101

Figure A1: Inbound and outbound FDI in Norway



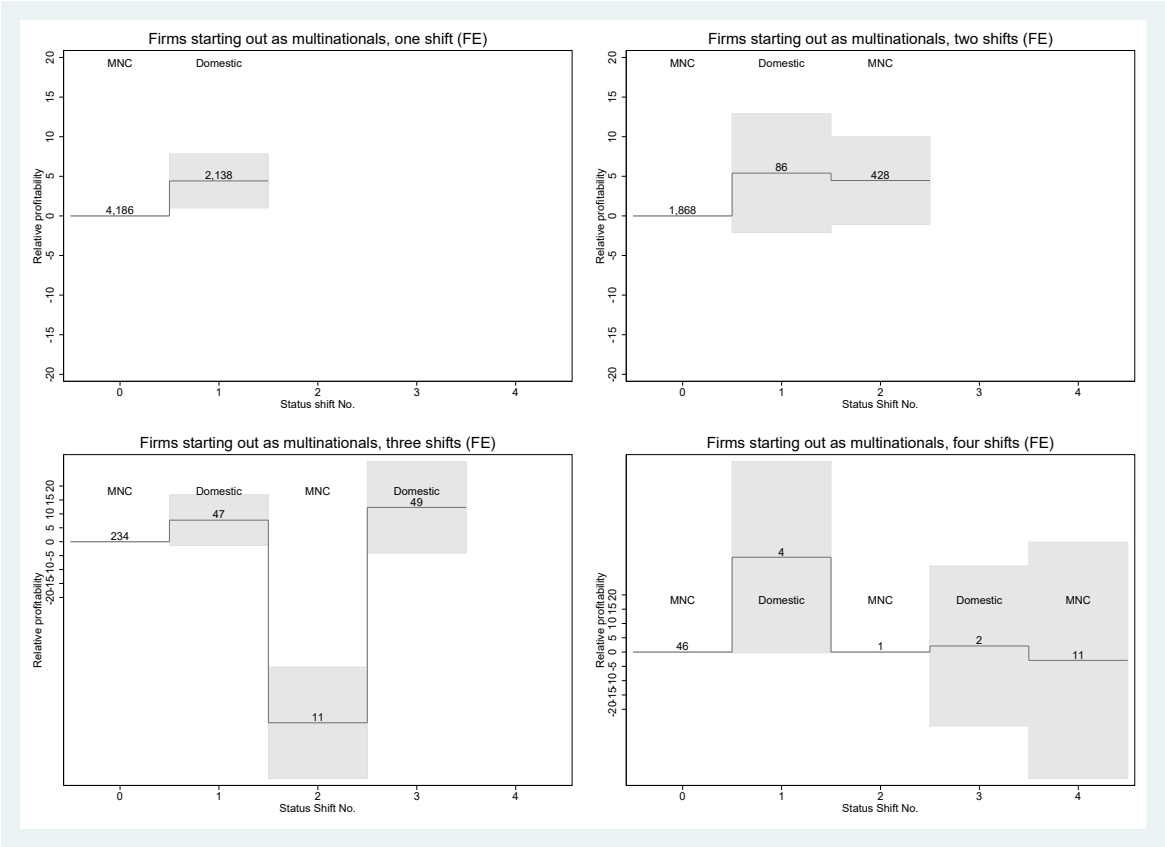
Source: Statistics Norway, StatBank Table 06223 and 04837 at www.ssb.no.

Figure A2: Profitability differences with each status shift modelled separately and the sample split on firms that shift exactly one, two, three, and four times. Firms starting out as domestic.



The number of identifying observations behind each graphed regression coefficient is given above the respective line segments. The numbers vary partly due to variation in how many years the firms spend in each state, and partly because all firms with a certain number of shifts are not necessarily included in all states due to the sample restrictions explained in Section 4.2.3. In a further robustness test we have restricted the sample to firms where we have at least one valid observation behind each line segment graphed, and the main pattern still persists (not reported). OLS results look similar.

Figure A3: Profitability differences with each status shift modelled separately and the sample split on firms that shift exactly one, two, three, and four times. Firms starting out as multinational.



The number of identifying observations behind each graphed regression coefficient is given above the respective line segments. The numbers vary partly due to variation in how many years the firms spend in each state, and partly because all firms with a certain number of shifts are not necessarily included in all states due to the sample restrictions explained in Section 4.2.3. In a further robustness test we have restricted the sample to firms where we have at least one valid observation behind each line segment graphed, and the main pattern still persists (not reported). OLS results look similar.



NHH



NORGES HANDELSHØYSKOLE
Norwegian School of Economics

Helleveien 30
NO-5045 Bergen
Norway

T +47 55 95 90 00
E nhh.postmottak@nhh.no
W www.nhh.no

