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Measurement Matters: How profit measurement affects profit shifting^{*}

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Abstract

This paper examines how the choice between book profits and taxable income affects profit shifting estimation. Using administrative tax data from France (2014-2022) covering the universe of firms with matched tax returns and financial statements, we document substantial book-tax differences, with book profits exceeding taxable income by a factor of 3 to 4. Book profits explain only 23.3% of taxable income variation, challenging the assumption that financial statement data can reliably proxy for tax bases. We demonstrate that measurement choices systematically bias profit shifting estimates. The profitability gap between multinational enterprises and domestic firms is substantially larger using taxable income than book profits. Semi-elasticity estimates vary dramatically by profit measures: pre-tax profit increase by 1.1 percent when the foreign tax rate increases by 1 percentage point, while taxable income increases by 1.9 percent. Tax haven analysis reveals missing profits of \in 17.7-38.9 billion over 2014-2022, depending on the measure used. These findings suggest studies using financial statement data may substantially underestimate profit shifting and have important implications for policies like the OECD's Global Minimum Tax.

Keywords: Tax avoidance, Multinational firms, book-tax differences

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1 Introduction

Measuring corporate profits is not a simple task, as firms report different profit figures for different purposes. Book profits, reported to shareholders and investors, are designed to showcase a company's financial performance, where higher profitability signals strong business health. In contrast, taxable income, reported to tax authorities, are calculated according to tax legislation with incentives to minimize tax liability through legal means. This fundamental tension creates a situation where firms naturally seek to maximize their book profits while minimizing their taxable income.

Despite this inherent divergence, the extensive literature examining corporate tax avoidance and profit shifting has often overlooked the methodological implications of using different profit measures in empirical analyses. The magnitude of this oversight is substantial - as our data reveals, book profits in France consistently exceed taxable income by a factor of 3 to 4, with book-tax differences (BTDs) reaching \notin 250 billion in some years. This gap represents an amount greater than the entire reported taxable income of French firms, raising critical questions about how profit measurement choices affect our understanding of profit shifting behaviors.

The traditional empirical approaches to estimating profit shifting have generally relied on a single profit measure, without adequately addressing the potential distortions this methodological choice might introduce. Estimates vary widely depending on the data sources used, with differences observed between macro and micro studies. When focusing on micro-level studies, papers using administrative data seem to find larger tax avoidance compared to those using financial data. The lack of consensus on profit shifting estimates across studies using different data sources suggests that profit measurement choices may significantly influence research conclusions and policy recommendations.

Our paper addresses this methodological gap by examining how the choice between book profit and taxable income affects profit shifting estimates. Using a unique combination of comprehensive administrative data from France covering the period 2014-2022, we make four primary contributions.

First, we document the extent and drivers of book-tax differences across time, ownership types, and firm sizes. Unlike previous papers relying on private financial statement data with inherent selection biases, our access to administrative tax returns provides unprecedented insight into these measurement differences. We utilize France's unique institutional setting, where every firm must publish financial statements and provide detailed book-tax reconciliation to tax authorities. The complete breakdown from book profits to taxable income offers a detailed understanding of the adjustments and discrepancies between accounting and tax reporting. We find that domestic MNEs account for approximately 60% of total book profits but less than 25% of total taxable income, with book-tax differences concentrated among the largest 0.1% of firms who contribute over 60% of total differences.

Second, we investigate the predictive relationship between book profit and taxable

income at the firm level. Our analysis demonstrates that book profits have severely limited predictive power for taxable income, explaining only 23.3% of the variation in taxable income for the full sample. This finding challenges the implicit assumption in much of the existing literature that profit measures derived from financial statements can serve as reliable proxies for the tax base. Even when using EBIT as an alternative predictor, about half of the variation in taxable income remains unexplained. The predictive power varies dramatically across entity types, with domestic standalones showing better correlation while MNEs show much weaker relationships.

Third, we demonstrate how these measurement differences affect key profit shifting estimation approaches. Firm profitability differs widely between book profitability and tax profitability. Book profitability is consistently higher than tax profitability, and this finding holds across ownership types. For multinational enterprises, especially domestic MNEs, the book-tax profitability gap is remarkably wide at approximately 2.5 percentage points, compared to a much narrower gap of 0.5-1 percentage point for non-MNEs. This systematic difference suggests that analyses based solely on book profits may substantially underestimate profit shifting activities. When examining the firm size distribution, we find that this profitability gap widens dramatically among the largest entities. The bias may be particularly salient among the largest firms, where profit shifting is most concentrated.

Fourth, we reproduce key profit shifting studies and document substantial heterogeneity in semi-elasticity estimates depending on the profit metrics used and specification choices. When reproducing traditional semi-elasticity methods (Hines Jr and Rice, 1994; Huizinga and Laeven, 2008). We estimate how book profit, earnings before interests and taxes (EBIT) and taxable income respond to a change in the foreign average tax rate, following Johannesen et al. (2020); Francois and Vicard (2023). We find magnitudes of approximately 1.1 when using book profits but the semi-elasticity of taxable income is almost twice as large and reaches 1.9.

We then engage in further analysis of the tax haven connection, following Wier and Erasmus (2023). We find that subsidiaries of MNEs headquartered in tax havens report significantly lower profits than other foreign MNEs, with gaps more pronounced when using taxable income (8.3 percentage points) than book profits (5-6.8 percentage points). This translates to estimated missing profits of \notin 17.7-38.9 billion over the period 2014-2022 depending on the profit measure used. This effect is particularly strong among the largest firms, with the top 10% of firms contributing about 80% of total missing profits in France.

Finally, we investigate firms that report null or negative profits. We find that MNEs tend to have a higher probability of reporting losses, which holds across different profit metrics. Our examination of bunching behavior around zero profit reveals significant differences between book and tax profit distributions. While bunching is observed for both profit measures, there is a much greater mass at zero for taxable income after accounting for net operating losses (NOLs). Unlike previous studies, we do not find substantial differences between MNEs and domestic groups in their bunching behavior, even when using matched samples, suggesting that this particular behavior may not be primarily

driven by tax avoidance strategies.

These findings have important implications for both research methodology and policy design. For researchers, our results highlight the critical importance of being transparent about profit measurement choices and considering how these choices might bias findings. The systematic differences we document suggest that financial statement data may provide incomplete or misleading insights into tax avoidance behaviors, particularly for the largest multinational enterprises where profit shifting is most economically significant. For policymakers, particularly in the context of implementing initiatives like the OECD's Global Minimum Tax, understanding the relationship between financial statement information and tax bases is essential for accurately projecting revenue impacts and designing effective anti-avoidance measures.

We contribute to the book-tax differences literature by using a unique framework which enables us to focus on the universe of firms without having to reconstruct any variable. We also provide a more recent analysis and a European institutional framework, as the vast majority of prior research has focused on the United States in the late 1990s and early 2000s (Desai, 2003; Desai and Dharmapala, 2009; Hanlon, 2005). Our analysis also contributes to the profit shifting literature by providing an in-depth understanding of the biases introduced by the use of financial statement data to study the tax responsiveness of firms.

The remainder of this paper is organized as follows. Section 2 describes the measurement issues that we observe in the profit shifting literature. Section 3 provides some instutional details on the French setting and explains how such a setting creates a perfect framework to study measurement biases. Section 4 descriptively shows the magnitude and origin of book-tax differences. Section 5 investigates how these measurement differences affect three prominent profit shifting estimation approaches. Section 6 concludes.

2 Conceptual Framework and Empirical Strategy

2.1 Why Profit Measures Matter

Profit shifting research aims to estimate how firms respond to international tax incentives, with profit being the central variable in the analysis of profit shifting. Yet, despite its importance, the way it is measured varies substantially across studies. These differences reflect data availability and methodological choices, and they have important implications for the interpretation of estimated tax effects.

Book profits and taxable income, the two most commonly used definitions, serve different institutional purposes. Book profits are prepared under financial accounting standards for the benefit of shareholders and creditors, whereas taxable income determines actual corporate tax liabilities. These two measures often diverge due to differences in timing, deductions, exemptions, and consolidation rules. Crucially, firms may have stronger incentives to manipulate taxable income than book profits, precisely because it affects their tax burden. In contrast, book profits are subject to stricter reporting standards and may be less responsive to tax incentives. This asymmetry suggests that profit shifting estimates based solely on book profits may understate the true behavioral response.

Despite this, the empirical literature has overwhelmingly relied on financial statement data, especially from Orbis. Maintained by Moody's Analytics, Orbis offers standardized accounting and ownership data for millions of firms and has become the dominant source for international tax research since the early 2010s. Most estimates of tax semi-elasticities in recent meta-analyses are based on this type of data (see, e.g., Huizinga and Laeven, 2008; Dharmapala and Riedel, 2013; Beer and Loeprick, 2015; Johannesen et al., 2020; Francois and Vicard, 2023; Heckemeyer and Overesch, 2017; Beer et al., 2020). One limitation of Orbis is its unequal coverage across countries, but also within country. Recent research by Fuest et al. (2022) using German country-by-country reporting data reveals that Orbis covers only 26% of German MNEs' affiliates.

Access to tax return data remains limited, though a few studies have leveraged it to estimate tax effects more directly (Grubert et al., 1993; Dowd et al., 2017; Bilicka, 2019; Bilicka et al., 2024; Altshuler et al., 2024). Some studies adopt a hybrid approach by combining tax returns with financial statement data when tax files lack sufficient detail for estimation (Mills and Newberry, 2004; Bilicka, 2019). However, such linkage may introduce selection biases, as not all firms are required to publish financial reports.

Even among studies using financial data, the choice of profit measure varies. Some rely on pre-tax or after-interest profits that reflect a broad set of avoidance channels, including inter-company debt and the location of intangible assets (Dharmapala and Riedel, 2013; Dischinger and Riedel, 2011). Others focus on earnings before interest and taxes (EBIT), which excludes financial channels and is generally interpreted as isolating the effects of transfer pricing (Huizinga and Laeven, 2008; Beer and Loeprick, 2015). Estimates based on EBIT are typically lower than those based on broader profit definitions (Heckemeyer and Overesch, 2017), highlighting the sensitivity of tax responsiveness estimates to how profits are defined.

Despite these known differences, few studies have systematically compared tax semielasticities across profit definitions using consistent data and estimation strategies. Our contribution is to fill this gap. Using rich administrative data, we estimate standard profitshifting models across a range of profit definitions, both book-based and tax-based, under a unified empirical framework.

2.2 Empirical Models of Profit Shifting

Our analysis is based on three established empirical specifications from the profit shifting literature, each offering a different perspective on how multinational firms respond to tax incentives. We use these models to assess how the definition of profit affects estimated profit shifting.

The first is the canonical semi-elasticity model introduced by Hines Jr and Rice (1994)

and extended by Huizinga and Laeven (2008). Reported subsidiary profits are modeled as the sum of underlying economic profits and profits shifted in response to international tax differentials:

$$Pr_i = P_i + S_i = P_i(1 + \theta \Delta \tau_{i,j}), \tag{1}$$

where P_i is true local profit, θ is the semi-elasticity, and $\Delta \tau_{i,j}$ is represents the tax incentive to shift profit and could be for example tax rate differential between country *i* and other jurisdictions *j* within the multinational group. In practice, empirical studies estimate a log-linearized form:

$$\log(Pr_i) = \alpha + \gamma \log(L_i) + \delta \log(K_i) + \theta \Delta \tau_{i,j} + \varepsilon_i, \qquad (2)$$

where L_i and K_i represent labor and capital, and ε_i is an error term. This framework dominates the empirical literature and provides a standard benchmark for identifying profit shifting (see Beer et al. (2020), Heckemeyer and Overesch (2017)). Meta-analyses report estimated semi-elasticities typically ranging from 0.8 to 2.0, implying that a 1 percentage point increase in the tax differential reduces reported profits by 0.8–2.0%.

A second model from Wier and Erasmus (2023) compares profitability between foreignowned subsidiaries with and without a parent in a tax haven. The assumption is that haven-linked groups have stronger incentives or means to shift profits. They estimate:

$$\log(y_{ist}) = \beta_1 \mathbb{1}_{\text{Parent in TH}} + \delta \boldsymbol{X}_{it} + \nu_s + \gamma_t + \varepsilon_{ist}, \qquad (3)$$

where $\mathbb{1}_{\text{Parent in TH}}$ equals one if the firm's parent is located in a tax haven, and X_{it} includes controls for firm size and labor costs. A negative β_1 indicates lower reported profits, consistent with profit shifting.

Finally, a recent strand of literature examines bunching at zero profits. Recent studies show that multinational affiliates are more likely to report zero or near-zero profits than domestic firms (Bilicka, 2019; Bilicka et al., 2024; Johannesen et al., 2020; Francois and Vicard, 2023). Bilicka (2019) emphasizes that incentives to report zero profits differ between book and tax reporting, helping to distinguish tax avoidance from underlying performance.

These three settings serve as the empirical foundation of our study. In the next subsection, we describe how we implement them to test whether using taxable income versus book profits systematically alters conclusions about profit shifting.

2.3 Strategy to Test Measurement Bias

We implement a structured empirical strategy to evaluate how the choice of profit measure affects estimated profit shifting. Our identification relies on estimating the same regression model across multiple definitions of the dependent variable, while holding the specification and covariates constant. This enables a clean comparison of tax semi-elasticities attributable solely to measurement. We begin by applying the canonical model to the universe of French corporate groups using administrative tax data. The richness of this dataset allows us to construct a range of profit measures, including pre-tax book profits, EBIT, taxable income before and after net operating losses, and consolidated taxable income. By estimating the semi-elasticity for each definition separately, we can assess how the measured responsiveness of profits to tax incentives varies with the accounting concept used.

Finally, we examine extensive margin responses by analyzing the distribution of zero and negative profits across different definitions. This part of the analysis helps determine whether tax incentives affect firms' propensity to report losses or zero taxable income, and whether certain measures are more sensitive to manipulation near the tax liability threshold.

3 Data and Institutional Context

The French system provides an ideal laboratory for examining how different profit measures affect our understanding of multinational enterprise behavior, as it combines granular data and standardized accounting requirements with comprehensive disclosure obligations.

3.1 Institutional Context: French Accounting and Tax System

3.1.1 Reporting Requirements and Public Disclosure

France has comprehensive reporting requirements that ensure transparency in corporate financial disclosure. All commercial companies must file their annual accounts with the Commercial and Companies Register (RCS) to guarantee transparency, with these accounts being published in the Official Bulletin of Civil and Commercial Announcements (Bodacc) upon receipt by the Commercial Court registry.

The reporting requirements vary by company size, with three distinct reporting formats: basic (normal), simplified (for small companies), and developed systems. These depend on the legal form and size of companies, defined by balance sheet total, turnover, and number of employees. Very small firms¹ and small² and medium-sized enterprises³ can request confidentiality for their accounts.⁴ Listed companies⁵ must publish annual financial data and deposit approved balance sheets and profit and loss statements with local commercial courts, along with quarterly sales figures and semi-annual provisional

¹Very small firms or micro-enterprises are firms with at least two criteria met: balance sheet $\leq \in 2M$, turnover $\leq \in 2M$, or ≤ 10 employees.

²Firms with balance sheet \leq €7.5M, turnover \leq €15M, or \leq 50 employees.

³Firms with balance sheet $\leq \notin 43M$, turnover $\leq \notin 50M$, or ≤ 250 employees.

 $^{^{4}47\%}$ of small and medium-sized businesses in 2020, 41% in 2019 and 36% in 2018 opted for confidentiality (Lefevbre-Dalloz).

⁵These firms are usually incoporated as a "Société Anonyme" which is the equivalent of a Public Limited Liability Comapny (PLC).

balance sheets.

3.2 French Accounting Standards

France operates under a dual accounting framework that reflects both national requirements and European harmonization. The national framework is based on French Generally Accepted Accounting Principles (GAAP), also known as the Plan Comptable Général (PCG). French GAAP is based on the principle of prudence, requiring businesses to record all potential losses and liabilities even if unlikely to occur, and emphasizes historical cost accounting over fair value.

For European harmonization, France follows EU Regulation 1606/2002, which requires all EU-listed companies to apply International Financial Reporting Standards (IFRS) as adopted by the EU for their consolidated financial statements since 2005. Listed companies must prepare group financial statements in accordance with IFRS, while all other companies prepare annual financial statements according to French Commercial Code principles and the General Accounting Chart.

All accounting transactions must be recorded in French and in compliance with the Plan Comptable Général, requiring chronological recording in books regardless of parent company international frameworks. This creates a foundation where book profits reflect standardized accounting principles while maintaining compatibility with international standards for multinational enterprises.

3.3 Tax System Overview

Corporate Tax Rates and Structure. The statutory tax rate in France was 33,3% until 2018 and then was progressively reduced to 25% in 2022.⁶ For small and medium-size enterprises, with a turnover below €42,500, a reduced rate of 15% is applied since 2022.⁷ Firms with a turnover exceeding €7.63 million are also subject to a social contribution which equals 3.3% of the tax liability less some abatement of up to €763,000.

Loss Treatment and Tax Consolidation. The French system allows carry-back of losses for one year and unlimited carry-forward in time. Firms can elect for tax consolidation with the other entities that meet the 95% ownership requirement to the head of the tax group.⁸ The benefit of tax consolidation is the possibility of offsetting profits and

⁶Large firms, with a turnover greater than €250 million were also subject to an exceptional tax during the period 2011-2016, which amounted to 5% and 10.7% of their tax liability. In 2017, firms with a turnover greater than €1 billion and €3 billion were subject to an exceptional tax equal to 15% and 30% of their tax liability.

 $^{^{7}}$ It only applies to firms whose fully paid-up capital is at least 75% owned, directly or indirectly, by individuals.

⁸"A French subsidiary can be included in a tax consolidated group even if its parent company is not located in France. However, at least 95% of the share capital of the foreign company must be held, directly or indirectly, by the French company that is head of the tax consolidated group. In addition, the foreign

losses between entities. Firms that elect for tax consolidation have to remain in the tax group for 5 years. The corporate income tax is then levied on the aggregate income after certain adjustments (e.g. neutralisation/de-neutralisation of capital gain or loss on the sale of assets, provisions) have been made. The tax is paid by the head of the fiscal group but the tax charge is freely allocated between members of the tax group through internal contracts.

Parent-Subsidiary Regime. The EU Parent-Subsidiary Directive (2011/96/EU) establishes a common system of taxation designed to facilitate the functioning of corporate groups across EU member states by eliminating tax obstacles to profit distributions. The directive exempts dividends and other profit distributions paid by subsidiary companies to their parent companies from withholding taxes and eliminates double taxation of such income at the parent company level. A parent company qualifies under the directive if it holds a minimum of 10% in the capital of a company from another member state. The directive requires that qualifying companies have their tax domicile within the EU and be subject to corporation tax without the possibility of an option and without being exempt. To prevent abuse, the 2015 amendment added anti-abuse rules designed to tackle arrangements that are not genuine and do not reflect economic reality.

3.4 Book-Tax Conformity and Key Adjustments

France maintains a system of modified book-tax conformity, where taxable income is fundamentally derived from book income but subject to numerous specific adjustments. Companies start with their accounting profit determined under French GAAP and then apply a series of adjustments on tax form 2058-A called "Tableau de détermination du résultat fiscal". Book profits are the results of the operating income, financial income and the profit attributed or loss transferred, which yields the current income before tax, which we call *pre-tax profit* or book profit. We then need to account for the extraordinary result, less employees' profit sharing less the corporate income tax paid to obtain the *after-tax book profit*, which is the starting point of the book-tax reconciliation on Form 2058. To then obtain the *taxable income*, one need to make several adjustments, which include adding back non-deductible expenses ("réintégrations") such as certain provisions, excess depreciation, fines, and a portion of entertainment expenses. Then, companies deduct tax-exempt income ("déductions") including the 95% dividend participation exemption, certain tax-exempt provisions, and unrealized gains recognized for accounting but not tax

company must be subject to CIT, be located in the European Union or in a member state of the European Economic Area whose tax treaty with France includes a mutual administrative assistance clause to fight tax fraud and tax evasion, and hold 95% of the lower-tier subsidiary's shares. For financial years starting on or after 1 January 2015, firms can also adopt horizontal tax consolidation. This allows tax consolidation among French sister or cousin companies that have a common parent company in an EU member state or a member state of the European Economic Area (EEA) that has concluded an administrative assistance agreement with France (i.e., Iceland, Liechtenstein, or Norway)." PWC

purposes. The resulting taxable income becomes the basis for applying the corporate income tax rate. The French tax system allows for approximately 200 adjustments, which creates systematic differences between book and taxable income through both add-backs and deductions. These adjustments can be categorized into several major groups based on their economic rationale and quantitative importance. We provide the full decomposition in Appendix A.1.

For a firm, only permanent book-tax differences matter as temporary differences only result in timing differences which eventually reverse. These temporary differences result in deferred tax assets or liabilities on the balance sheet. The key permanent differences in France are non-deductible expenses, among which certain fine and penalties, company car tax, excess depreciation, excessive compensation to executives and non-deductible provisions. Some of the income is also tax-exempt, such as dividend income qualifying for the participation exemption, capital gains on qualifying shareholdings and income from foreign branches exempt under tax treaties. The tax code's numerous adjustments particularly for multinational enterprises with intra-group transactions—create substantial divergences that affect both the level and distribution of reported profitability across firm types.

3.5 Data Description and Sample Construction

We use the universe of tax returns in France for the period 2014-2022 provided by the French Tax Administration (BIC dataset). A key feature of this dataset is that we have information on the income statement of firms, as per accounting standards and on the adjustments that are made to book profits to reach the reporting of taxable income. We therefore do not have to rely on external private data, such as data from Orbis. We can fully use the universe of firms in France and understand the differences between book profit and taxable income and the consequences of such differences. Our data therefore do not suffer from any selection bias. We also have access to data on the balance sheet of the firms.

We retrieve information on tax consolidation and the composition of entities in tax groups from the FDG-IS Groupe databases. Our analysis is conducted at the taxpayer level. For tax-consolidated groups, the parent company is treated as the taxpayer, with the taxable income representing the consolidated income (from FDG - IS GROUPE). For non-consolidated entities, the taxpayer is the legal entity itself, with taxable income reported on the individual tax return (from BIC).

Complementing the tax data, the LIFI database collects information on the ownership structures of legal entities resident in France. This allows to determine the firm's nationality and the geographical distribution of affiliates, including details on ownership rank and control rates.

We combine tax return information with financial statement information, using the mandatory public reporting of financial statements. We access this unique dataset and generate, for each firm, several proxies of profits. We have information on (1) EBIT, (2) pre-tax book profit (from financial statements), (3) after-tax book profit, (4) taxable income before net operating losses and tax consolidation, (5) taxable income after net operating losses.

In addition to the administrative data we also rely on Orbis to compare the financial data and ensure a good correspondence with the administrative financial data. We also use the ownership structure from Orbis to extend the coverage of the LIFI affiliate network of the MNEs we observe and construct the tax incentive variable. To use Orbis we perform some cleaning, in particular we identified several cases with unit errors (e.g. when variables should be in thousands but are not).

We provide a description of our key variables of interest and specific references to the tax forms in Table B.1.

We drop firms in the financial, insurance, real estate, and agricultural as they benefit from a different tax regime. We also drop micro-standalones, which are firms with less than 10 employees and with annual sales or balance sheet total not exceeding $2M \in$.

3.6 Sample Descriptives

Our final sample covers 7,510,620 firm-year observations, of which 5,688,915 observations contain non-missing key financial information such as profits (EBIT, pre-tax book profit and taxable income), total assets and payroll. We distinguish between 4 types of firms: domestic standalones (French independent companies that are not part of any groups), domestic groups (groups of companies headquartered in France with no subsidiaries outside of France), domestic MNEs (group of companies headquartered in France with at least one subsidiary outside of France) and foreign MNEs (French subsidiaries of foreign MNEs).

Table 1 reports the composition of our sample. 67% of the observations in our sample are domestic standalones, 26% belong to a domestic group 4.6% belong to a domestic MNE and 2.5% belong to a foreign MNE. Only 3.3% of firms are in a tax group. We also show that 29% and 33% of firms report book or tax losses respectively.

There is substantial variation in the firms we observe. On average, a firm reports $5.2M \notin$ of turnover, while the median firm only reports a turnover of only $436,000 \notin$. Similarly, the average payroll is of about $1M \notin$ and the median stands at $198,000 \notin$. We provide more descriptives in Table 2.

3.7 Comparison with Orbis and Limitations

Because most of the profit shifting literature relies on Orbis data, we compare our financial profit measures to those available in Orbis to assess consistency. To this end, we merge our administrative data at the legal entity level with the Orbis database. We obtain a sample of 3,918,870 firm-year observations.

We focus on two common indicators from financial statements, EBIT and pre-tax book

Table 1: Composition of the sample

	Obs.	Share obs. $(\%)$	Share total assets $(\%)$	Share payroll (%)
Domestic Standalone	3.897.909	68.51	6.33	19.70
Domestic Group	$1,\!472,\!565$	25.88	11.52	21.80
Domestic MNE	184,103	3.24	64.79	40.43
Foreign MNE	$134,\!338$	2.36	17.36	18.08
Taxpayers in a tax group	$247,\!867$	4.36	77.96	52.40
Book losses	$1,\!536,\!347$	27.01	18.51	20.16
Tax losses	$2,\!344,\!745$	41.22	41.16	36.30

Note: This table shows the composition of our sample. The sample covers 5,688,915 taxpayeryear observations for which we have information on profits, total assets and payroll. Book losses correspond to a negative or null reported book profit, while tax losses correspond to a negative or null taxable income. Data from BIC-IS, FDG-IS-GROUPE, LIFI.

	Obs.	Mean	Median	Std. Dev.
Total Assets	5,688,915	16,069.23	644.79	1,244,049.09
Turnover	$5,\!673,\!930$	$6,\!421.02$	647.03	340,805.73
Payroll	$5,\!688,\!915$	1,073.22	198.38	$33,\!696.14$
EBIT	$5,\!688,\!915$	191.50	23.30	20,980.58
Pre-tax book profits	$5,\!688,\!915$	428.09	24.16	47,406.51
Taxable income before NOLs	$5,\!687,\!168$	145.52	20.44	$16,\!617.61$
Taxable income after NOLs	$5,\!688,\!915$	127.82	$10,\!43$	$16,\!330.27$
Book-tax difference	$5,\!688,\!915$	300.27	2.01	42,451.40

 Table 2: Descriptive Statistics

Note: All variables are in thousands euros. *Source:* Data from BIC-IS, FDG-IS-GROUPE, LIFI. Sample including observations containing non-missing profits (EBIT, pre-tax book profit and taxable income), total assets and payroll. Sample filtered from taxpayers classified as agricultural or financial for at least one year. Years: 2014-2022.

profit, and we show in Table 3 that the profit measures derived from administrative data are highly correlated with their Orbis counterparts. This confirms that our data provide comparable financial indicators, allowing us to relate our findings to existing studies.

Our dataset also allows comparisons across three types of information: Orbis-based financial statements, financial statements from the full population of firms, and administrative tax returns. This enables us to assess how both the source of data and the definition of profit affect estimates of profit shifting.

As we mentioned in Section 3.4, intra-group dividends are included in our measure of pre-tax book profit. The strong correlation between the measure of pre-tax profit in Orbis and the measure of pre-tax profit from administrative data suggests that dividends are also included in Orbis. We know from Blouin and Robinson (2023) that such equity income is included in some of the data on US MNEs provided by the Bureau of Economic Analysis, but we had to this date no evidence on the inclusion of equity income in Orbis. The inclusion of equity income in firms' pre-tax profits leads to a misattribution of income

	(1) Pre-tax profit (BIC)	(2) EBIT (BIC)	(3) Total assets (BIC)
Pre-tax profit (Orbis)	0.977^{***} (0.0001)		
EBIT (Orbis)		0.808***	
		(0.0002)	
Total assets (Orbis)			1.050^{***}
			(0.0001)
Obs.	2,954,384	2,956,938	3,805,055
R^2	0.983	0.802	0.971

Table 3: Correlation between Orbis and BIC

Note: This table shows the correlation between different variables from our administrative data and the values from the Orbis database. Merged BIC-IS and Orbis data. * p < 0.10, ** p < 0.05, *** p < 0.01.

at the entity level, as some income earned in another entity, potentially in another country, is included in the shareholding firm. This also leads to a double counting of income when we aggregate firms, either at the taxpayer level for tax-integrated firms or at the group level if we want to investigate the effects of taxes at the business group level.

As intra-firm dividend payments may be used to remit profits to the parent company, we expect that contribution of equity income to total book profits to be significant for domestic MNEs. Also, as equity income is often excluded from the tax base, this suggests the discrepancy between pre-tax book profit and taxable income and hence the bias arising from using Orbis is likely greater for domestic MNEs.

Our focus throughout the paper will be on the comparison between using a measure of pre-tax profit in financial statements and using taxable income to understand the implications of the choice of profit measures on profit shifting estimation. Our analysis will also provide evidence on the bias resulting from the use of a selected sample of financial information from Orbis.

4 The Size and Structure of Book-Tax Differences

4.1 Aggregate Trends

The definitions of book profits and taxable income differ widely, which leads to significant differences in the amounts of reported profits, depending on the definition we use. We show in Figure 1 the total amount of book profits and taxable income (before and after considering net operating losses) reported by French firms. While all profit definitions seem to follow similar growth path, the magnitude of book-tax differences reaches \notin 250 billion in some year, which represents an amount greater than the amount of profits reported for tax purposes. Over that period, book profits are 3 to 4 times larger than taxable income

as we can see on panel (b).

Figure 1: Magnitude of book-tax differences

(a) Aggregated book profit and taxable income

(b) Book profits - Taxable income ratio



Note: Figure 1a shows total amounts of profits and income using different measures. Figure 1b shows the ratio of total pre-tax book profits to total taxable income. *Source:* Data from BIC-IS, FDG-IS-GROUPE, LIFI. Sample filtered from taxpayers classified as agricultural or financial for at least one year. Years: 2014-2022.

4.2 Variation by Firm Type and Size

We then decompose book-tax differences by firm type. A key feature of our data is that we can differentiate between domestic standalones, domestic groups, domestic MNEs and foreign MNEs. Figure C.1 shows that domestic MNEs are the largest group in terms of book profits. They represent about 60% of the total reported book profits. The three other firm types all represent about 7-17% of the total each. However, when looking at taxable income, we find that domestic MNEs only account for a small share of total reported taxable income. Because of the extent of losses by domestic MNEs (Figure C.2), domestic MNEs account for less than 25% of total taxable income. Therefore, book-tax differences mainly come from domestic MNEs that make up more than 75% of the total book-tax differences. We show on Figure 2 how each firm type contributes to the aggregate book-tax difference over time.

We then move to study how book-tax differences differ along the firm distribution, by firm type. We plot the contribution of each decile on Figure 3. We pool the bottom 90% as these combined deciles only account for less than 5% of the total book-tax differences. This holds across firm types. Very large domestic MNEs, in the top 0.1% of total assets, account for more than 70% of the total book-tax differences, while top 0.1% foreign MNEs represent about 10% the total difference. Within firm types and size, a slightly different picture emerges. Figure C.3 shows that the top 1% of MNEs contributes largely to booktax differences.



Figure 2: Contribution of firm type to total book-tax differences

Note: This figure shows the contribution of each firm type to the difference between pre-tax book profit and taxable income. *Source*: Data from BIC-IS, FDG-IS-GROUPE, LIFI. Sample filtered from taxpayers classified as agricultural or financial for at least one year. Years: 2014-2022.

Figure 3: Contribution of decile of firm size to book-tax differences



Note: We define declies as the declies of total assets. Source: Data from BIC-IS, FDG-IS-GROUPE, LIFI. Sample filtered from taxpayers classified as agricultural or financial for at least one year. Years: 2014-2022.

4.3 Main Components of Book-Tax Differences

We dig further into the book-tax differences and decompose the latter into its main components as detailed on Form 2058. In Figure 4, we present the decomposition of add-backs and deductions for multinational firms (which account for more than 75% of the aggregate book-to-tax difference). Interestingly, the main deduction for MNEs is related to tax-exempt intra-group dividends that fall under the parent-subsidiary regime. In France, parent firms can indeed almost entirely deduct from their taxable income the net financial product from their participations in their subsidiaries. These tax-exempted dividends thus account for a large share of the book-to-tax difference. The second largest item gathers miscellaneous deductions that are to be reported by the firm on a separate sheet. Although we know what items are factored in this entry, we do not have access to these separate sheets and our firm-level data only allow us to observe the total euro amount of miscellaneous deductions, leaving the exact breakdown of it unknown. As we describe in Section A.2, a number of these items are related to tax incentives such as state subventions for scientific research, expenses for the acquisition of the work of a living artist or exceptional deductions for productive investments. Finally, some charges that were previously taxed are not factored in book profits but can be deducted from taxable income and constitute the third main deduction. Regarding add-backs, the main items are non-deductible charges and miscellaneous add-backs to be reported on a separate sheet (of which we do not have the detail) and that include, as a matter of example, donations to NGOs, the non-deductible fraction of social contributions or the interests on a loan that allowed the purchase of a company by its employees.





Source: Data from BIC-IS, FDG-IS-GROUPE, LIFI. Sample filtered from taxpayers classified as agricultural or financial for at least one year. Years: 2014-2022.

In figure C.4, we show the decomposition of add-backs and deductions for non-MNEs. We observe that miscellaneous add-backs and deductions are the main components of the book-to-tax difference. However, we again note that intra-group dividends account for a significant share of deductions, being the second largest item for domestic groups and the third for national standalones.

4.4 Predictive Power of Book Profits for Taxable Income

A fundamental concern is whether book profits can reliably predict taxable income across different types of business entities. To investigate this relationship, we analyze the correlation between pre-tax book profits, EBIT, and taxable income before NOLs across different entity types.

	Full Sample	Dom. standalones	Dom. groups	Dom. MNEs	For. MNEs			
		Panel A: EBIT	1					
EBIT	0.408***	0.763***	0.453***	0.442***	0.092***			
	(0.0004)	(0.0005)	(0.001)	(0.002)	(0.003)			
Obs.	1,292,065	893,318	311,247	60,602	26,898			
\mathbb{R}^2	0.394	0.730	0.339	0.448	0.032			
	Pa	nel B: Pre-tax boo	k profit					
Pre-tax book profit	0.104***	0.694^{***}	0.322***	0.098***	0.257***			
	(0.0002)	(0.0004)	(0.001)	(0.001)	(0.001)			
Obs.	1,292,374	893,440	311,343	60,638	26,953			
\mathbb{R}^2	0.233	0.772	0.445	0.223	0.565			
Fallel	C: Pre-tax t	book pront without	, intra-group d	lividends				
Pre-tax book profit	0.354^{***}	0.857^{***}	0.539^{***}	0.340^{***}	0.620^{***}			
without dividends	(0.0004)	(0.001)	(0.001)	(0.002)	(0.003)			
Obs.	$1,\!292,\!374$	893,440	311,343	$60,\!638$	26,953			
\mathbb{R}^2	0.437	0.733	0.498	0.431	0.628			
	Derest D		Defense NOI -					
	Panel D	: Taxable Income I	Sefore NOLS					
Tax. income bef. NOLs	0.950^{***}	1.021^{***}	0.981^{***}	0.946^{***}	0.970^{***}			
	(0.0001)	(0.0001)	(0.0002)	(0.001)	(0.001)			
Obs.	$1,\!295,\!099$	894,815	$311,\!583$	$61,\!251$	$27,\!450$			
\mathbb{R}^2	0.979	0.990	0.981	0.979	0.984			

Table 4: Correlation between EBIT, PBT, and taxable income

Note: This table shows the results of a linear regression of the form: $log(Taxable income_i) = \alpha + \beta y_i + \epsilon_i$, where y_i is either log(EBIT), log(PBT), log(PBT without dividends) or log(Tax profits before NOLs). The profit and income variables are averaged over the sample period. Data from BIC-IS, FDG-IS-GROUPE, LIFI. *p<0.1; **p<0.05; ***p<0.01

Table 4 presents correlation coefficients and R^2 values between taxable income and two potential predictors averaged over the sample period to reduce the noise due to differences in accruals and transitory shocks. We consider two measures of profits from financial statements: pre-tax book profits and EBIT. The results reveal substantial limitations in using financial statement information as a reliable proxy for taxable income.

Our analysis demonstrates that book profits have limited predictive power for taxable income. We first consider EBIT and find that EBIT explains approximately 39.4% of the variation in taxable income for the full sample, with a correlation coefficient of 0.408. The

relationship is strongest for domestic standalone entities ($R^2 = 0.73$), while it remains particularly weak for domestic MNEs ($R^2 = 0.448$) and foreign MNEs ($R^2 = 0.032$).

We then consider pre-tax profit as a predictor of taxable income. In the full sample, book profits explain only 23.3% of the variation in taxable income, with a correlation coefficient of just 0.104. This finding suggests that close to 80% of the variation in taxable income remains unexplained when using book profits as a predictor. The predictive power of book profits varies somewhat across entity types but remains consistently low. The explanatory power is better for domestic standalones which show an R^2 of 0.772. However, for domestic groups and MNEs, book profits explain merely between 44.5% and 22.3% of the variation in taxable income, respectively. Foreign MNEs show a slightly improved but still modest R^2 of 0.565. The analysis performs even more poorly when focusing on annual value of profits and income as we show in Table C.1. In the full sample, pre-tax book profits explain only 21.1% of the variation in taxable income.

As intra-firm dividends constitute an important part of book-tax reconciliation, we remove intra-firm dividends from book income and re-estimate the relation between this adjusted measure of pre-tax profit and taxable income and show the results in Panel C. We find that the predictive power of the new measure is improved relative to pre-tax income but about half of the variation is still unexplained.

In stark contrast, taxable income before NOLs demonstrate exceptionally high correlation with taxable income across all entity types, with R^2 values ranging from 0.979 to 0.990. This suggests that NOLs are not key in understanding book-tax differences. However, tax-specific adjustments and considerations are critical in determining actual tax liabilities and cannot be adequately captured by financial reporting metrics.

5 Measurement Effects on Profit Shifting Estimates

5.1 Consequences of Book-tax Differences on Firm Profitability

The choice between book profits and taxable income as the basis for measuring profit shifting has implications for empirical estimates and policy conclusions.

First, book profitability consistently exceeds tax profitability across all firm types, but with substantial heterogeneity in the magnitude of this gap. For multinational enterprises, particularly domestic MNEs, the discrepancy is remarkably pronounced – approximately 2.5 percentage points – compared to a much narrower gap of 0.5-1 percentage point for non-MNEs (domestic standalones and domestic groups) as we show in Figure 5. This systematic difference suggests that analyses based solely on book profits may substantially underestimate the extent of profit shifting activities.

When examining profitability along the firm size distribution (Figure 6), we observe that the profitability gap between MNEs and domestic firms widens dramatically among the largest entities. For domestic MNEs in the top 0.1% of the size distribution, the profitability gap exceeds 2.2 percentage points and shows a clear monotonic increase across

Figure 5: Firm profitability



as profit (or taxable income in the case of tax liability) over total assets. *Source*: Data from BIC-IS, FDG-IS-GROUPE, LIFI.

size percentiles. This size gradient suggests that the treatment of largest firms, which contribute disproportionately to overall profit shifting volumes, is key to estimating profit shifting. This poses a methodological challenge as large MNEs often lack suitable non-MNEs of similar scale.



Figure 6: Profitability gap – Top 10%

Note: This figure shows the profitability gap by decile of firm size. Firm size is proxied by total assets. Profitability is defined as profit (or taxable income in the case of tax liability) over total assets. The profitability gap is defined as the difference between pre-tax book profitability and tax profitability. *Source:* Data from BIC-IS, FDG-IS-GROUPE, LIFI.

5.2 Standard Semi-Elasticity Regressions

We now investigate how profit measurement affects profit shifting estimation when using the empirical methods described in section 2.2. We first reproduce traditional estimation methods from Hines Jr and Rice (1994) and Huizinga and Laeven (2008). We run the following regression:

$$log(y_{ist}) = \beta_1 \tau_{ijt} + \delta \mathbf{X}_{it} + \nu_s + \gamma_t + \epsilon_{ist}$$
(4)

where τ_{ijt} is a measure of profit shifting incentives, proxied by the average foreign tax rate faced by subsidiary *i* following Johannesen et al. (2020) and Francois and Vicard (2023). We use four profit measures as dependent variables: EBIT, pre-tax book profits (PBT), after-tax book profits, and taxable income after net operating losses. For the financial variables EBIT and PBT, we present the results using both the values reported in Orbis and those reported in our administrative data (BIC). We use industry and year fixed effects and restrict the sample to firms that have a positive and non-missing value for each of the four profit proxies. We construct a measure of the foreign average tax rate using the full ownership network that we obtain from Orbis. Despite the fact that the coverage is limited for financial information, information on the ownership structure of the MNE, including tax haven subsidiaries, is available, even when no balance sheet information is available (Garcia-Bernardo et al., 2021). We perform the regressions on a subsample of legal units from our administrative database that are matched to Orbis and that belong to MNEs.

The estimates in Table 5 show that when using financial variables the effects are as follows: a 1 percentage point higher foreign average tax rate increases EBIT by 1.2 percent and profit before tax by 1.1 percent. These values closely match prior consensus estimates, which range from 0.8 to 1.0 in meta-analyses by Heckemeyer and Overesch (2017) and Beer et al. (2020). However, when we use taxable income as the dependent variable, the estimated semi-elasticity rises sharply to nearly 1.9. This substantial increase suggests that firms' actual tax bases are considerably more responsive to international tax differentials than their financial accounts. The divergence highlights that relying solely on book profits may understate the magnitude of profit shifting. Our findings highlight the importance of profit definition: estimates based on accounting data may not fully capture the behavioral response to taxation, while taxable income better reflects the real exposure of the corporate tax base to international tax incentives.

5.3 Parent Company in a Tax Haven

We then build on Wier and Erasmus (2023) and estimate the profitability gap between foreign MNEs whose parent firm is in a tax haven and other foreign MNEs. The assumption is that, by having a parent in a tax haven, the French subsidiaries are able to shift profits, at least to a greater extent that other non-haven owned foreign MNEs and should therefore report lower profits in France. We show in Table C.3 that in our data, the tax-haven linkage that we observe for foreign MNEs is mainly due to having a parent in a tax haven.

To study this, we estimate the following regression:

$$log(y_{ist}) = \beta_1 \mathbb{1}_{\text{Parent in TH}} + \delta \boldsymbol{X}_{it} + \nu_s + \gamma_t + \epsilon_{ist}$$
(5)

	(1) EBIT (log) Orbis	(2) EBIT (log) BIC	(3) PBT (log) Orbis	(4) PBT (log) BIC	(5) After-tax profits (log)	(6) Taxable in- come (log)
Av. foreign STR	1.162^{*}	1.203**	1.070	1.096^{*}	1.059	1.869**
	(0.603)	(0.601)	(0.652)	(0.646)	(0.653)	(0.677)
Total assets (log)	0.714^{***}	0.713^{***}	0.803***	0.802***	0.807^{***}	0.737***
	(0.014)	(0.014)	(0.012)	(0.012)	(0.012)	(0.014)
Payroll (log)	0.144^{***}	0.144^{***}	0.091^{***}	0.091^{***}	0.075^{***}	0.101^{***}
	(0.017)	(0.017)	(0.012)	(0.012)	(0.011)	(0.015)
R^2	0.720	0.719	0.742	0.743	0.740	0.662
Observations	60,740	60,740	60,740	60,740	60,740	60,740

Table 5: Semi-elasticity regression – Average foreign tax rate

Note: This Table shows the results of estimating equation 4 on a sample of firms matched to Orbis. The sample is restricted to MNEs. We include time and industry fixed effects. Standard errors are clustered at the MNE level. Our measure of tax incentives is defined as the average foreign tax rate faced by firm *i*. We use the definition of the ownership network from Orbis to define the list of subsidiaries. Data from BIC-IS, FDG-IS-GROUPE, LIFI, Orbis. *p<0.1, **p<0.05, ***p<0.01

where y_{ist} is alternatively the earnings before interests and taxes (EBIT), pre-tax book profits (PBT), after-tax book profits or taxable income. $\mathbb{1}_{\text{Parent in TH}}$ is a dummy equal to 1 is the subsidiary belongs to an MNE headquartered in a tax haven. X_{it} is a vector of controls, which encompass the log of total assets and the log of the wage bill. ν_s and γ_t are sector and year fixed effects respectively. We estimate equation 5 using administrative data at the taxpayer level. The sample is restricted to taxpayers that belong to foreign MNEs with positive and non-missing value for each of the four profit proxies. We show the results in Table 6.

We find that subsidiaries of MNEs headquartered in a tax haven report significantly lower profits than other foreign MNEs. The gap is more pronounced when using taxable income than when using EBIT or book profits. The tax haven affiliation leads to a 8.3 percentage point difference in the reported taxable income of subsidiaries in the same sector, after controlling for their production inputs. If we use data from financial statements, the profitability gap associated with the tax haven affiliation is between 5 and 6.8 percentage point.

We then decompose the contribution of each decile of firm size to this profit gap. We split the sample in deciles of total assets and run the regression on each decile. The results are provided in Table 7. We show that there is no significant difference for the smallest MNEs, that belong to the bottom 40%. The coefficients then tend to be larger, in absolute value for the middle 40%, which are firms in the 40%-80% of the assets distribution, suggesting that larger firms tend to report lower profits if they have a tax haven connection. Finally, we observe a substantial role for the largest firms, where the tax haven connection leads to 17.6 percentage points lower taxable income for the top 10% of firms. However, we observe a much lower semi-elasticity of the reported pre-tax profit of the largest firms, around -0.10 and an even smaller and non significant coefficients for EBIT and after-tax

	(1) EBIT (log)	(2) PBT (log)	(3) After-tax profits (log)	(4) Taxable in- come (log)
Parent in TH	-0.061^{***} (0.015)	-0.068^{***} (0.017)	-0.050^{***} (0.017)	-0.083^{***} (0.018)
Total assets (log) Pavroll (log)	0.726*** (0.007) 0.166***	0.756*** (0.007) 0.151***	0.781*** (0.007) 0.122***	0.687*** (0.008) 0.159***
	(0.009)	(0.008)	(0.008)	(0.009)
Observations R^2	68,084 0.754	68,084 0.758	68,084 0.741	68,084 0.648

Table 6: Semi-elasticity regression – Parent in tax haven

Note: This Table shows the results of estimating equation 5 using administrative data. The unit of observation is a taxpayer and we focus on foreign MNEs. We include time and industry fixed effects. Standard errors are clustered at the MNE level. Our measure of tax incentives is defined as the average foreign tax rate faced by firm *i*. We use the definition of the ownership network for the LIFI database to define the list of subsidiaries. Data from BIC-IS, FDG-IS-GROUPE, LIFI. *p<0.1, **p<0.05, ***p<0.01

profit semi-elasticity. We provide a comparison of coefficients and their significance in Figure 7.

Figure 7: Profitability gap by decile



Note: This Figure plots the point estimates and 95% confidence intervals from Table 7. The estimates are obtained from regressions of equation 5, using administrative data at the taxpayer level. The sample is restricted to foreign MNEs and is divided into deciles of total assets. Separate regressions are estimated for each decile. Data from BIC-IS, FDG-IS-GROUPE, LIFI.

Using the point estimates from Table 7, we estimate that the missing profits of foreign MNEs amount to about 17.7-38.9 bnt over the period 2014-2022, depending on the proxy for profits used. Using a measure of EBIT or book profits lead to much lower profit shifting

estimates, between 17.66 bn€ and 24.47 bn€ than when we use taxable income (38.91 bn€).

$ \begin{array}{c c} \mbox{Parent in TH} & 0.117 & 0.052 & -0.0 \\ \hline 0.0759 & (0.043) & (0.0 \\ \hline 0.077* & -0.0 \\ \hline 0.077* & 0.077* & -0.0 \\ \hline 0.0759 & (0.045) & (0.0 \\ \hline 0.00 & (0.047) & (0.0 \\ \hline 0.00 & (0.034 & -0.0 \\ \hline \end{array} \right) \\ \mbox{Parent in TH} & 0.001 & 0.034 & -0.0 \\ \hline \end{array} $	-0.040 (0.038) -0.045 (0.039) -0.018	-0.042 (0.038)	Б П П					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-0.040 (0.038) -0.045 (0.039) -0.018	-0.042 (0.038)	TOT	r (log)				
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	(0.038) -0.045 (0.039) -0.018	(0.038)	-0.070*	-0.100***	-0.130^{***}	-0.135^{***}	-0.070*	-0.066
$\begin{array}{c} \mbox{Parent in TH} & 0.127^{*} & 0.077^{*} & -0.0 \\ & (0.075) & (0.045) & (0.0 \\ & (0.029) & (0.047) & (0.0 \\ & (0.086) & (0.047) & (0.0 \\ & (0.086) & (0.034 & -0.0 \\ & & & & & & & \\ \end{array}$	-0.045 (0.039) -0.018		(0.037)	(0.036)	(0.037)	(0.039)	(0.037)	(0.043)
	-0.045 (0.039) -0.018 (0.040)		Pre-tax _I	profits (log	(
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(0.039) -0.018 (0.040)	-0.035	-0.095**	-0.099***	-0.145^{***}	-0.136^{***}	-0.066*	-0.101^{**}
$\begin{array}{c c} \text{Parent in TH} & 0.129 & 0.100^{**} & -0.0 \\ & (0.086) & (0.047) & (0.0 \\ & \text{Parent in TH} & 0.001 & 0.034 & -0.0 \end{array}$	-0.018	(0.038)	(0.038)	(0.038)	(0.039)	(0.041)	(0.039)	(0.046)
Parent in TH 0.129 0.100** -0.0 (0.086) (0.047) (0.0 Parent in TH 0.001 0.034 -0.0	-0.018		After-tax	profits (lo	g)			
(0.086) (0.047) (0.0 Parent in TH 0.001 0.034 -0.0	(0.040)	0.003	-0.076**	-0.076*	-0.151***	-0.114***	-0.056	-0.066
Parent in TH 0.001 0.034 -0.0	(0.0.0)	(0.039)	(0.038)	(0.040)	(0.041)	(0.043)	(0.040)	(0.048)
Parent in TH 0.001 0.034 -0.0			Taxable i	ncome (log	(
	-0.061	-0.089**	-0.104^{**}	-0.145***	-0.136^{***}	-0.149***	-0.019	-0.176^{***}
(0.082) (0.049) $(0.0$	(0.043)	(0.042)	(0.042)	(0.041)	(0.041)	(0.045)	(0.046)	(0.062)
Obs 1,763 5,743 6,89	6,893	7,508	7,729	7,933	7,667	7,353	8,267	7,228
Controls								
Assets (log) x x x x	х	x	x	x	x	х	x	×
Payroll (log) x x x	x	x	x	x	x	х	×	×
Sector FE x x x x	х	x	x	x	x	х	x	×
Year FE x x x x	x	x	x	x	x	×	×	×

the sample to foreign MNEs. The sample is split in deciles of total assets and we run the regression on each decile. Data from

BIC-IS, FDG-IS-GROUPE, LIFI. ${}^*p<0.1$, ${}^{**}p<0.05$, ${}^{***}p<0.01$.

Table 7: Profitability effect of having a parent company in a tax haven - Decile

Overall, this leads to a highly skewed contribution of a few firms to total missing profits. In Figure 8, we show that the top 10% of firms contribute to about 80% of the total missing profits in France over our sample period. This holds irrespective of the profit measure that we consider. Because these firms have so much profits to shift, the top 10% of foreign firms account for about 65-70% of total profits (Figure C.6), they also contribute to a substantial share of shifted profits.

Figure 8: Firm size and missing profits



Note: This figure shows the total amount of missing profits by decile of total assets. The results are shown using various profit measures (book profits and EBIT) and taxable income. The figure also indicates the contribution of each decile of firm size to the total amount of missing profits. *Source*: Data from BIC-IS, FDG-IS-GROUPE, LIFI. The sample is restricted to foreign MNEs.

5.4 Accounting for Zero and Negative Profits

While losses are usually ignored in the tax avoidance literature,⁹ we have some evidence that MNEs are more likely to report zero profit (Bilicka, 2019), and the more so if they have an incentive to do so (Johannesen et al., 2020) or the capacity to do so (Francois and Vicard, 2023). We investigate whether we observe any difference between MNEs and non-MNEs in their behavior around reporting losses or null profits, and if any difference exists based on the profit measure considered.

Loss-making firms. One main criticism of the semi-elasticity literature is the use of the logarithm of profit as a dependent variable, which excludes de facto all firms with losses and firms with no profit. As we observe in Figure C.2, 30% of foreign MNEs and almost 45% of domestic MNEs report a negative pre-tax profit, so regressions running a

⁹With a few exceptions such as Schwab et al. (2023) and De Simone et al. (2017).

	Pr(book p	orofits < 0)	$\Pr(\text{tax profits} < 0)$		
	Linear	Logit	Linear	Logit	
Dummy MNE	0.104***	0.465***	0.096***	0.412***	
Marginal eff.		0.103		0.096	
R^2	0.012		0.01		
Obs.	969,660	969,660	963,774	$963,\!774$	

Table 8: Probability to report negative profits

Note: This table presents the results for our matched sample of the linear and probit regressions of $_{1_{\text{Profits}} < 0}it = \beta_{1_{\text{MNE}_{it}}} + \epsilon_{it}$. Matched sample is created by matching each MNE to a non-MNE in a given sector and a given year without replacement using total assets. Data from BIC-IS, FDG-IS-GROUPE, LIFI. *p<0.1, **p<0.05, ***p<0.01.

semi-elasticity model, with financial statement data ignore a large share of firms. Studies using tax returns data ignore an even greater share of firms, as 50% to 60% of the MNEs in our sample report a negative taxable income. This is in line with Bilicka et al. (2024) who find that about half of MNE subsidiaries in the UK report a negative taxable income.

Because MNEs and non-MNEs may differ substantially, we implement a matching approach to compare the loss-reporting behavior of MNEs and non-MNEs in a given sector, in a given year with a comparable size, proxied by total assets. We show in Figure C.5 that, while firms differ widely before matching, they are very comparable after matching, along several dimensions such as turnover, wage bill and total assets. We also provide some descriptive statistics in Table C.2. We estimate the probability of firms to report a loss and provide the result in Table 8. We show that MNEs have a greater probability to report losses compared to non-MNEs. MNEs are 10% more likely to report a loss than non-MNEs. This holds both for measures of book profits and taxable income.

A strand of research suggests that larger firms incur fewer losses, as put by Gaertner et al. (2024) "larger firms typically have less volatile income and are less likely to incur losses than smaller firms". They find that the lower ETR faced by larger firms is attributable to the asymmetries in the tax treatment of profits and losses and that threequarters of the size-ETR relation are explained by losses. However, such findings rely on consolidated data from Compustat. Comparing evidence from consolidated data and our evidence built on unconsolidated information, it appears that the blending of profits and losses leads to a higher frequency of consolidated profits for larger firms, even though their individual subsidiaries are more likely to report losses than entities of the same size that do not belong to an MNE. This finding has important implication for understanding the relation between firm size and ETR, as the possibility for tax consolidation for groups implies an immediate benefit of losses, which mitigates the asymmetric tax treatment of profits and losses even though the larger firms on average appear to be profitable at the consolidated (or at least country) level. The inability to engage in such profits and losses offsetting appears to be detrimental to smaller entities (Gaertner et al., 2024). **Bunching at zero profit.** Finally, we investigate whether firms behave similarly around zero profits, depending on the measure of profits used. Koethenbuerger et al. (2019) show that firms have an incentive to report zero taxable income as there exists a kink in the tax schedule where firms do not pay taxes if they do not have income to report. We therefore expect a mass at zero taxable income, but it is not clear whether firms should also bunch at zero book profits. This could go two-way. Either firms do not have enough capacity to generate positive book profits and reach zero taxable income using the book-to-tax items and therefore need to also report zero book profits, or they have enough flexibility and can report non-zero book profits and still reach zero taxable income.

Bilicka (2019) shows that we observe lower bunching at zero profit when considering book profits from Orbis than when using taxable income in the UK for MNEs, while she does not observe such a difference for domestic standalones. We run the same exercise and find a different result. While we can reproduce the fact that bunching using pre-tax book profit is similar across firm types, Figure 9 shows that overall, we observe bunching around zero profit of similar magnitude relative to taxable income before accounting for NOLs. However, we observe a much greater mass at zero profit if we consider taxable income after accounting for net operating losses. We decompose this figure by firm type and show the results in Figure C.7. The behavior of domestic groups, domestic standalones and MNEs is very similar. We observe some bunching for both book profits and taxable income. The extent of bunching is of similar magnitude across firm type and between book profits and taxable income before accounting for NOLS, a set-up which compares to Bilicka (2019). One clear pattern however emerges. While we always observe bunching, there is a major role played by carried-over losses, that allow firms to bunch exactly at zero profit since there is no incentive for firms to offset more than their tax liability by using their past losses. Every firm type but domestic standalones show this pattern. This is consistent with the findings of Christensen et al. (2022) and van der Geest and Jacob (2020) who study firms with very low ETRs and profitable firms with no tax liability respectively. In both papers, the authors conclude that firms reach zero or close to zero ETRs by using past accumulated losses.

We run the same analysis on the sample of MNEs matched to non-MNEs described above. We do not find any meaningful difference between MNEs and non-MNEs in their behavior around zero profit when using a measure of taxable income after accounting for past losses as we show in Figure C.8. The only difference that we observe is that there appears to be a missing mass just above zero for MNEs, relative to non-MNEs, which is consistent with our findings that non-MNEs report a higher profitability than MNEs as we show on Figure C.9.

Therefore, we provide evidence of a clear bunching at zero taxable income, and given the large share of firms reporting losses, the traditional measures of profit shifting considering only positive profits leads to ignoring a large share of firms. However, our current results do not support the assumption of MNEs bunching more at zero profit than non-MNEs, which suggests that this bunching may not be related to tax avoidance, as it is

Figure 9: Bunching around zero profits



Note: We plot on the x-axis the return on assets, defined as profits (or taxable income) over total assets, in percentage. We focus on returns on assets close to zero, between -0.5% and 0.5%.

driven by past losses. Our results complement the findings of Christensen et al. (2022) and van der Geest and Jacob (2020) who study near-zero ETRs using consolidated data from Compustat. Our analysis at the entity or taxpayer level confirms that zero-tax firms, that we proxy by a negative taxable income, is driven mainly by carried-over losses.

6 Conclusion

This paper provides the first comprehensive analysis of how profit measurement choices systematically affect our understanding of corporate tax avoidance and profit shifting behaviors. Using unique administrative data from France combining tax returns with mandatory financial statements for the universe of firms over 2014-2022, we document substantial differences between book profits and taxable income with profound implications for empirical research and policy design.

Our findings reveal that book profits consistently exceed taxable income by a factor of 3 to 4, with book-tax differences reaching $\notin 250$ billion annually. These differences are highly concentrated among domestic multinational enterprises, with the largest 0.1% of firms contributing over 60% of aggregate differences. The predictive relationship between book and taxable income is surprisingly weak, with book profits explaining only 23.3% of variation in taxable income.

When we reproduce key profit shifting estimation approaches, measurement choices substantially affect both magnitude and interpretation of results. The profitability gap between multinational enterprises and domestic firms is significantly larger when measured using taxable income rather than book profits. Our semi-elasticity estimates show remarkable variation depending on the profit measure and data source used. We find magnitudes of 1 when using book profits but reaching 1.9 when using taxable income. This dramatic difference highlights how profit measurement bias estimates. Our analysis of tax haven connections reveals missing profits ranging from \notin 17.7 to \notin 38.9 billion total over 2014-2022, a difference demonstrating the economic significance of measurement choices.

These results have significant implications for both research and policy. For researchers, our findings highlight the need for transparency about profit measurement choices and suggest that studies relying exclusively on financial statement data may substantially underestimate profit shifting activities, particularly among the largest multinational enterprises. The selection bias introduced by databases such as Orbis mingles with these measurement problems. For policymakers implementing initiatives like the OECD's Global Minimum Tax, understanding the relationship between financial reporting and tax bases is crucial for accurate revenue projections and effective policy design.

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A Accounting standards and book-tax differences in France

A.1 From value-added to book profits and taxable income

We build from the form 2052 and 2058 to provide this simplified decomposition of book and taxable income. The forms can be found here.

Value \mathbf{Added}_u

- + Operating $Subsidies_u$
- Taxes and $charges_u$
- = Gross Operating Surplus (EBE \approx EBITDA)_u
- Depreciation and $Amortization_u$

= Net Operating Surplus $(NOI)_u$

- + Other Operating $Income_u$
- Other Operating $Expenses_u$

= Operating Income ($\approx \text{EBIT}$)_u

- + Financial Result_u
- + Profit attributed or loss transferred_u
- Loss attributed or profit transferred_u

= Current Income Before Tax_u

- + Extraordinary Result_u
- Employees' profit sharing_u
- Corporate Income Tax_u
- = Accounting/Book Profits_u
- + Tax Reintegrations_u
- Tax Deductions_u
- = taxable income before loss carryback and carryforward_u
- + Loss carryback and carryforward_u
- = taxable income (before consolidation)_u

A.2 Major Permanent Book-Tax Differences in France

Dividend Participation Exemption ("Régime Mère-Fille") The participation exemption regime represents one of the most significant sources of permanent BTDs in France. Under Articles 145 and 216 of the CGI, when a French company holds at least 5% of another company's shares for a minimum of two years, 95% of the dividends received are exempt from corporate tax. Only the remaining 5% is considered a lump-sum representation of expenses related to the shareholding and remains taxable. The accounting treatment requires full recognition of dividend income, creating a permanent difference between accounting and taxable income equal to 95% of the dividend amount. For large corporations subject to the standard 25% corporate tax rate, this creates a permanent tax benefit of 23.75% of the total dividend amount ($95\% \times 25\%$).

Depreciation and Amortization Differences French tax law permits accelerated depreciation methods that often exceed book depreciation, particularly for equipment and certain immovable fixtures. The tax code allows full and immediate depreciation of some intellectual property acquisition costs, creating timing differences that can be substantial for technology-intensive firms.

Additionally, the treatment of provisions for asset depreciation differs significantly between book and tax purposes. Provisions for depreciation on shares subject to the participation exemption regime are not deductible for tax purposes, even when the market value falls below book value. This restriction particularly affects holding companies and investment entities.

Provision and Reserve Limitations The French tax code imposes strict limitations on the deductibility of various provisions that are permitted under accounting standards. Provisions for retirement benefits, foreign exchange risks on certain loans, and redundancy payments are generally not deductible. These restrictions reflect the tax system's emphasis on realized rather than anticipated expenses.

Particularly noteworthy are the limitations on provisions for contingent liabilities, which can be established under accounting principles but are generally not deductible until the liability becomes fixed and determinable. This creates persistent book-tax differences for companies with significant contingent exposures, such as litigation or environmental remediation costs.

Interest Deduction Limitations Recent reforms have introduced earnings-based interest limitation rules that can create substantial book-tax differences for highly leveraged entities. French companies can only deduct interest expenses up to the greater of $\in 3$ million or 30% of their tax earnings before interest, taxes, depreciation and amortization (EBITDA). For thinly capitalized entities (where related-party debt exceeds 1.5 times equity), even stricter limitations apply, restricting deductions to the greater of $\in 1$ million or 10% of tax EBITDA.

These limitations create both level differences (when interest exceeds the deduction threshold) and timing differences (as non-deductible amounts can be carried forward indefinitely). The impact is particularly pronounced for private equity-backed entities and multinational groups with significant intra-group financing.

Stock Compensation and Employee Benefits The treatment of stock-based compensation creates systematic book-tax differences, particularly for multinational corporations with employee stock option plans. While accounting standards require the expensing of stock options at fair value over the vesting period, French tax law often provides deductions only when options are exercised and actual cash outflows occur.

Similarly, differences in the timing of deductions for employee benefits, pension contributions, and deferred compensation create persistent book-tax gaps. The tax code generally follows a cash basis for these items while accounting standards use accrual methods.

Non-Deductible Expenses Several categories of expenses recognized for accounting purposes are partially or fully non-deductible for tax purposes, creating permanent BTDs:

- Fines and penalties: Article 39-2 of the CGI prohibits the deduction of criminal and administrative penalties, creating a permanent positive BTD.
- Company car tax (Taxe sur les Véhicules de Sociétés): Partially non-deductible, with deductibility percentages varying based on vehicle emission levels.
- Excess luxury item depreciation: Depreciation on passenger vehicles exceeding certain cost thresholds (typically €30,000) is non-deductible.
- Certain entertainment expenses: While generally deductible, specific categories of entertainment expenses face restrictions, including yachts, hunting lodges, and fishing properties.
- Non-deductible provisions: Certain provisions required by accounting principles are not recognized under tax law, including provisions for unrealized foreign exchange losses in certain cases.

Capital Gains on Qualifying Shareholdings Long-term capital gains on substantial shareholdings (titres de participation) benefit from a reduced taxation regime. When a company sells shares held for at least two years and classified as participation shares in its balance sheet, the capital gain is subject to a reduced effective tax rate of 3% (12% of the gain taxed at 25%). This creates a permanent BTD because the full capital gain is recognized in accounting profit, while only 12% is included in taxable income. For significant transactions, this can create substantial permanent differences that materially impact effective tax rates in the year of the transaction.

Miscellaneous add-backs and deductions. Some non-deductible expenses under Article 39-4 of the CGI, such as entertainment expenses related to hunting, fishing, pleasure boats, and executive residences that don't serve as the company's registered address need to be added-back. Vehicle-related limitations are particularly important, with depreciation caps varying by CO2 emissions. Financial charges represent another major category of add-backs, including excess interest on shareholder current accounts (Article 39-1-3° of the CGI) and thin capitalization adjustments under Article 212 bis. Other significant items include provisions that are non-deductible for tax purposes, fines and penalties, and certain depreciation adjustments. Deductions include exchange rate adjustments on foreign currency transactions, various tax incentives and special deductions to certain investment-related items and sector-specific provisions.

B Data appendix

	Box/code	Form	
		Admin	istrative data
EBIT	GG	2052	Résultat d'exploitation
Pre-tax profit	GW	2052	Résultat courant avant impôts
Book profits	HN	2052	Résultat comptable de l'exercice
Taxable income before NOL	XI/XJ	2058	Résultat fiscal avant imputation des déficits reportables
Taxable income after NOL	XN/XO	2058	Résultat fiscal
Net operating losses	XL	2058	Déficits antérieurs imputés sur les résultats de l'exercice
			Orbis
EBIT	EBIT		
Pre-tax profit	PBT		

Table B.1: Variable definitions

Note: Data from BIC-IS, FDG-IS-GROUPE and Orbis.

C Supplementary descriptives



Figure C.1: Magnitude of profits by firm type

Note: Figures C.1a and C.1b show the total amount of pre-tax book profit and taxable income reported by firm type over time.

Figure C.2: Share of firms with losses or null profits



Note: We consider the share of firms in a given firm type that have null profit or negative profits.

Figure C.3: Contribution of decile of firm size to book-tax differences



Note: We define deciles as the deciles of total assets.

	Full Sample	Dom. standalones	Dom. groups	Dom. MNEs	For. MNEs
EBIT	0.551***	0.639***	0.301***	0.587***	0.078***
R^2	0.500	0.385	0.437	0.540	0.027
PBT	0.159***	0.299***	0.294^{***}	0.161***	0.105***
R^2	0.211	0.245	0.506	0.212	0.230
PBT without dividends	0.387***	0.708***	0.331***	0.416^{***}	0.096***
R^2	0.413	0.462	0.515	0.445	0.099
Tax Bef. Carryf.	0.975***	1.002***	0.969***	0.976***	0.930***
R^2	0.984	0.984	0.978	0.984	0.965
Obs.	7.351 million	4.922 million	1.921 million	0.328 million	0.178 million

Table C.1: Correlation between EBIT, book profits, and taxable income

Note: This table shows the results of a linear regression of the form: $log(Taxable income_{it}) = \alpha + \beta y_{it} + \epsilon_{it}$, where y_{it} is either log(EBIT), log(PBT), log(PBT without dividends) or log(Tax profits before NOLs). Data from BIC-IS, FDG-IS-GROUPE, LIFI. *p<0.1; **p<0.05; ***p<0.01

Figure C.4: Decomposition of book-tax differences for non-MNEs



Source: Data from BIC-IS, FDG-IS-GROUPE, LIFI. Sample filtered from taxpayers classified as agricultural or financial for at least one year. Years: 2014-2022.

Figure C.5: Balancing tests



Note: These figures provide a comparison of the distribution of firms' total assets, tangible assets, payroll and turnover between MNEs and non-MNEs before and after matching.

	MNEs	Non-MNEs
Whole sample		
Number of taxpayers	$528\ 090$	$6 \ 985 \ 743$
Total assets	151.62	2.94
Tangible assets	27.81	0.87
Payroll	11.19	0.47
Trading turnover	51.45	1.78
Matched sample		
Number of taxpayers	$492\ 158$	$492\ 158$
Total assets	52.07	19.13
Tangible assets	14.53	6.82
Payroll	4.17	1.95
Trading turnover	18.36	9.47
Unmatched sample		
Number of taxpayers	35 932	$6\ 493\ 585$
Total assets	2043.18	1.70
Tangible assets	208.85	0.44
Payroll	97.04	0.37
Trading turnover	507.11	1.21

Table C.2: Unweighted means of firm-level characteristics

Note: Years: 2014–2022. All values are expressed in millions of euros (except for the number of taxpayers). Data from BIC, LIFI, IS GROUPE, FDG and PERIM.

		MNE lev	/el	Taxpayer level		
Year	Nb. MNEs	Parent in TH	Presence in TH	Nb. Taxpayers	Taxpayers with parent in TH	Taxpayers with presence in TH
2014	11670	4433	5039	19143	7225	8979
2015	12501	5172	5563	18948	8445	10117
2016	12419	4842	5488	19642	8351	10656
2017	12699	4963	5657	20227	8452	10824
2018	11493	4424	4886	19273	7269	8984
2019	12733	4933	5726	20581	8451	11184
2020	13387	5233	6064	21695	8986	11645
2021	13525	5466	6123	21200	9164	11513
2022	13877	5466	6350	23008	10274	12926

Table C.3: Foreign MNEs in tax havens

Note: This table shows descriptive statistics on the presence in tax havens of foreign MNEs in our sample. In 2014, out of 11,670 foreign MNEs, 4,433 were headquartered in a tax havens and 5,039 had at least one entity in a tax haven, either a subsidiary or the parent company. These 11,670 MNEs had 19,143 taxpayers in France. Out of these taxpayers, 7,225 had a parent in a tax haven and 8,979 belonged to an MNE that had at least one entity in a tax haven.

Figure C.6: Contribution of decile of firm size to profits



Note: We define deciles as the deciles of total assets. We focus on foreign MNEs.



Figure C.7: Bunching by firm type

Note: NOLs means Net Operating Losses and represents the amount of past losses the firm can use to offset current profits.



Figure C.8: Bunching - Matched sample

Note: NOLs means Net Operating Losses and represents the amount of past losses the firm can use to offset current profits. Solid lines represent MNEs and dotted lines represent non-MNEs.

Figure C.9: Bunching difference MNE vs non-MNE



Note: Figures C.9a and C.9b show the difference in the distribution of return on assets between MNEs and non-MNEs. Figure C.9a shows the distribution difference in the full sample and Figure C.9b shows the difference in the matched sample.