Profit Shifting, Employee Pay, and Inequalities: Evidence from US-listed Companies

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Abstract: Over the last few years, corporate tax avoidance has become a salient policy issue and has regularly been accused of aggravating income inequalities. Yet, systematic empirical evidence on its distributional implications remains lacking. In this paper, I explore the effect of profit shifting activities of multinational enterprises on employee pay. Using a rich database on executives, foreign subsidiaries, and financial statements of US-listed companies, I find that this effect substantially varies across occupations. While the compensation of chief executive officers and chief financial officers increases when their firm enters tax havens, non-executive employees, on the contrary, see their wage fall. Also, these reactions are more pronounced in intangible-intensive sectors. These new empirical findings are consistent with economic theory, cast light on the consequences of profit shifting, and might help explain recent trends in income inequalities.

Keywords: Employee pay, multinational enterprises, profit shifting, tax havens, income inequalities.

JEL codes: F16, H26, J30, M12.

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1 Introduction

What explains the rise of inequalities ? This question has been receiving growing attention in the literature (Alvaredo, Chancel, Piketty, Saez, and Zucman, 2017; Zucman, 2019; Hoffmann, Lee, and Lemieux, 2020; Saez and Zucman, 2020). Many factors have been put forward, and one of them is globalization. Globalization has many facets. It has, for example, been accompanied by the emergence and expansion of multinational enterprises (MNE). Together with the digitalization of economic activities and the development of the offshore industry, it has also facilitated corporate tax avoidance (Argilés-Bosch, Somoza, Ravenda, and García-Blandón, 2020; Beer, de Mooij, and Liu, 2020). MNE use technicalities of the tax code to artificially deflate profits recorded in high-tax countries and inflate those booked in tax-friendly jurisdictions. These practices have gained the public's attention in a period marked by various tax scandals, budget deficits, and a pandemic underlining the importance of public goods. However, although the methods employed by these firms are now well-documented, their consequences are still poorly understood. In particular, little is known about the effect of profit shifting on employee pay and income inequalities.

In this paper, I analyze the effect of profit shifting on both employee pay and income inequalities by distinguishing executives and non-executive employees. From a theoretical point of view, we expect MNE to pay a premium to their top executives when engaging in tax avoidance. The latter design tax strategies and are compensated on an after-tax basis to alleviate agency costs associated with moral hazard and adverse selection (Newman, 1989; Gaertner, 2014). Regarding the rest of employees, income shifting gives MNE private information on profits that improves their bargaining power and thereby compresses wages (Krautheim and Schmidt-Eisenlohr, 2016). Accordingly, economic theory suggests that profit shifting increases the compensation of top executives, decreases wages of the others, and thus deepens income inequalities. All the

same, no paper addresses these questions empirically and confronts these theoretical predictions with the data.

The present paper is a first step in this direction. It is divided into two parts. In the first part, I compile a database on financial statements, executives, and foreign subsidiaries of companies listed on the Standard & Poor's (S&P) 1500 index between 1993 and 2014. The data originate from three sources: Compustat, ExecuComp, and Exhibit 21 reports. Compustat provides access to balance sheets, income statements, and cash flows of US-listed firms. ExecuComp, as the name hints, contains a wide range of details about the function and compensation of executives in S&P 1500 firms. Exhibit 21 reports filled every year by US-listed firms to the Securities and Exchange Commission (SEC) allow constructing a list of their worldwide subsidiaries. Armed with this database, I then conduct an event study. Employing a difference-in-differences (DiD) technique, I estimate the impact of firm entry in tax havens on employee pay while separating chief executive officers (CEO) and chief financial officers (CFO) on the one hand from non-executive employees on the other hand.

The baseline results are in line with theoretical predictions. The compensation of CEO and CFO goes up when their firm expands its network of subsidiaries in tax havens, whether it is expressed in absolute value or as a ratio of the firm's average wage. I estimate a fourteen-percent increase after five years. Conversely, overall payments to non-executive employees decrease in the meantime. This reduction amounts to five percent five years post entry, and I show that it is not attributable to a drop in employment. Profit shifting therefore aggravates income inequalities within corporations. Moreover, I find that this pattern is all the more noticeable in sectors using intangible assets intensively. Again, this observation is consistent with earlier work showing that intellectual property offers additional opportunities to route income through tax-friendly jurisdictions like tax havens (Dischinger and Riedel, 2011; Karkinsky and Riedel, 2012; Griffith, Miller, and O'Connell, 2014; Alstadsæter, Barrios, Nicodème, Skonieczna, and Vezzani, 2018).

These results are confirmed by multiple robustness checks. First, I demonstrate that they hold with alternative groups of tax havens. In the benchmark exercise, I follow Dyreng and Lindsey (2009) and categorize 46 foreign countries as tax havens. Adopting the classification elaborated by Hines and Rice (1994), also standard in the literature, yields the same conclusions. Along the same lines, I remove six tax havens in another sensitivity test: Hong-Kong, Ireland, Luxembourg, Malaysia, Singapour, and Switzerland. Given that these countries are relatively large and well-connected with the rest of the world, foreign direct investments (FDI) in these countries may be unrelated to tax avoidance. On the contrary, it is fair to assume that investments in small and remote islands in the likes of Bahamas and Jersey completely fall within the scope of profit shifting. Second, I show that there is no pre-existing trend in employee pay before firm entry in tax havens. This observation supports the so-called "common trend" assumption, crucial when performing a DiD analysis. It also implies that entry in tax havens is uncorrelated with past executive $\times$ firm $\times$ year unobserved shocks and alleviates reverse causality concerns. Finally, I verify that negative weights are unlikely to jeopardize the average treatment effect (ATE). The econometrics literature points out that regressions with high dimensional fixed effects estimate weighted sums of the ATE. Because some of these weights might be negative and the ATE could be heterogeneous across firms or periods, the coefficient of interest could be negative (positive) even when all ATE are in fact positive (negative). I build on de Chaisemartin and D'Haultfœuille (2020) to cope with this issue. They discuss this problem for models with two-way fixed effects. I find a low share of negative weights in regressions with two-way fixed effects, so treatment effect heterogeneity should not constitute a major threat to the validity of my results.

These new empirical findings carry policy implications. They unveil one consequence of profit shifting. They reveal that profit shifting contributes to the rise in income inequalities and thus shed light on recent trends in income inequalities. Also, the results could help understand the backlash against multinational corporations and, more gene-

rally, globalization. Finally, my conclusions may enrich ongoing discussions about the international corporate taxation system. Although many reforms are already discussed at the international level to tackle profit shifting, this paper justifies the need to curb profit shifting in order to narrow income inequalities.

Literature and contributions This paper resonates with two distinct strands of the literature.

A nascent but fast-growing line of research studies profit shifting activities of MNE. It shows that MNE locate strategically their intangible assets, manipulate transfer prices, record sales in low-tax countries, and proceed with intra-firm loans, treaty shopping, and corporate inversions. I refer to Beer et al. (2020) for a recent survey. If the methods used by MNE are now relatively well-known, only a few papers, however, investigate the consequences of profit shifting. The latter document a positive effect of profit shifting on firm value (Desai and Dharmapala, 2009), firm investments (Overesch, 2009; Goldbach, Nagengast, Steinmüller, and Wamser, 2019), and industry concentration (Martin, Parenti, and Toubal, 2020). As mentioned above, some contributions analyze the impact profit shifting on employee pay. Companies pay top executives based on accounting financial performance to align interests and reduce operating risks. Hence, CEO and CFO should be rewarded when MNE establish a presence in tax havens. Non-executive employees, for their part, have lesser knowledge of the surplus they bargain over with the firm they work for. This informational rent for MNE should lead to lower wages. Nonetheless, systematic evidence on this remains lacking. This paper fills this gap. I bring these theoretical predictions to the data and find consistent results. In a sense, this paper provides empirical support for these theories.

An older body of the literature tackles the effect of corporate income taxation on wages. Corporate income taxation can affect wages through two channels: a direct one, through rent-sharing (Arulampalam, Devereux, and Maffini, 2012; Azémar and Hubbard, 2015; Fuest, Peichl, and Siegloch, 2018), and an indirect one, through capital reallocation (Harberger, 1962; Clausing, 2013; Gravelle, 2013). On the one hand, cor-

porate income taxes directly lower wages by undermining the quasi-rent over which workers and firms bargain. On the other hand, an increase in corporate income taxes results in capital outflows, which in turn decrease the capital-labor ratio, labor marginal productivity, and wages. Hence, both imply that the burden is passed onto workers to some extent. Because the location of economic activities and that of profits can be different, only the rent-sharing mechanism seems relevant in the context of profit shifting. Should we interpret profit shifting as a reduction in tax rates, these models would anticipate a positive effect of profit shifting on wages. Yet, I show that profit shifting is in fact detrimental for the large majority of employees. In a way, this finding suggests that we cannot analyze profit shifting as a simple tax cut through the lens of these models. Although the size of the pie shared between the firm and its workers increases, the latter also have less bargaining power. I argue that the second effect definitely needs to be taken into account since it dominates over the first one.

The remainder of the paper is organized as follows. Section 2 introduces the data. Next, section 3 lays out the econometric approach, the results, and the robustness checks. Lastly, section 4 concludes.

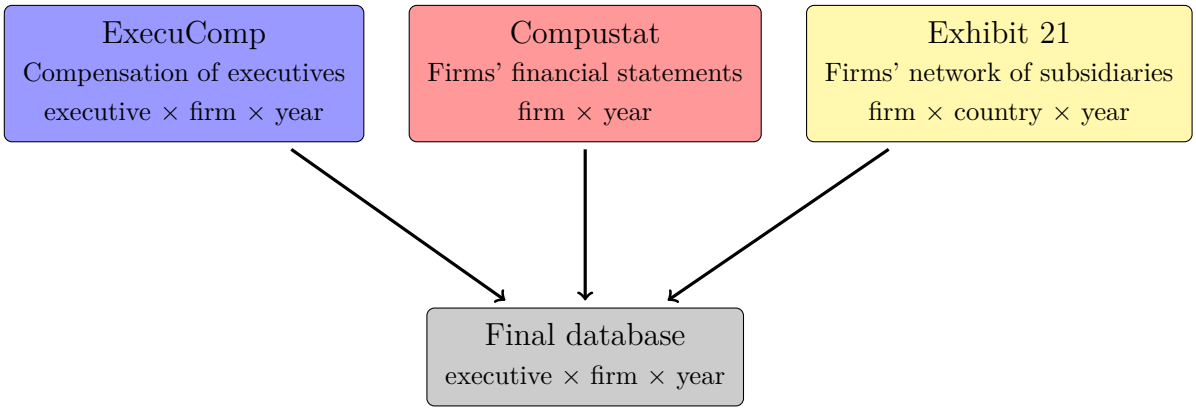
2 Data

To conduct my analysis, I construct a panel database on financial statements, foreign subsidiaries, and executives of S&P 1500 companies between 1993 and 2014. I hereby explain where these data are coming from and describe the final sample.

2.1 Sources

The data used for the study originate from three sources: ExecuComp, Compustat, and Exhibit 21 filings (see figure 1).

FIGURE 1 – Construction of the database



ExecuComp follows executives of S&P 1500 companies and provides extensive details on their function and compensation. Since these firms account for approximately 90 percent of US market capitalization, this dataset allows me to track executives over time and across the largest US publicly listed firms. This feature proves useful because these enterprises are the most likely to engage in FDI and profit shifting. Establishing facilities overseas is costly, and merely the largest and most productive firms can find profitable to pay these costs (Helpman, Melitz, and Yeaple, 2004). The same applies to aggressive tax planning and profit shifting (Jones, Temouri, and Cobham, 2018; Bilicka, Devereux, and Guceri, 2020). Firms have to incur a significant fee to recruit tax experts because undertaking such activities requires a deep understanding of tax systems. This competence has a price that solely the largest firms can afford. To illustrate this, anecdotal evidence suggests that Caterpillar paid PricewaterhouseCoopers nearly $55 million for developing its tax-dodging strategy (US Senate Permanent Subcommittee on Investigations, 2014).

The second source, Compustat, consists of balance sheet, income statement, and cash flow information of all publicly held corporations in North America since the 1950s. Thanks to the large coverage and the richness of the information, these data are commonly used in the accounting and economics literature. The data are consolidated at the firm level. I extract from this database S&P 1500 companies' total employment and labor expenses. I also retain their global assets, sales, and pre-tax income, all of

TABLE 1 – Summary statistics

Number of firms never present in a tax haven	1,742
Number of firms entering in tax havens	1,728
Number of firms always present in tax havens	225
Total number of firms	3,695

which gauge firms' economic activities worldwide and will be used as control variables in the econometric exercise.

Finally, I merge these data with Exhibit 21 filings to have an overview of the location of S&P 1500 firms' subsidiaries. The SEC obliges US-listed corporations to disclose each year a list of their significant subsidiaries in Exhibit 21 of Form 10-K. A subsidiary is considered significant if its assets represent at least 10 percent of all assets or if its income exceeds 10 percent of consolidated income. Furthermore, any subsidiary is deemed significant if by combining all undisclosed subsidiaries into one affiliate, this fictive affiliate accounts for at least 10 percent of assets or revenues. In other words, Exhibit 21 filings include subsidiaries where at least 90 percent of firms' consolidated assets and revenues are recorded. Therefore, they depict a clear picture of the worldwide network of US-listed companies' subsidiaries. [1] Corporations electronically file the reports since 1993 and the reports are publicly available on the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) platform of the SEC (see figure 2 for an example). I leverage an updated version of the database produced by Dyreng and Lindsey (2009) that spans the 1993-2014 period.

2.2 Descriptive statistics

In total, the database used for this paper contains 33,376 executives linked to 3,695 enterprises listed on the S&P 1500 between 1993 and 2014.

1. Note that companies are not obliged to uncover financial information concerning each of these subsidiaries. Besides, even though firms may have incentives to under-report the number of subsidiaries in tax havens, Dyreng, Hoopes, Langetieg, and Wilde (2020) argue that most disclosures are accurate. See their paper and Dyreng and Lindsey (2009) for more details on these data.

FIGURE 2 – List of significant subsidiaries of Johnson & Johnson in Exhibit 21 (2011, non-exhaustive)

Name of Subsidiary	Jurisdiction of Organization
U.S. Subsidiaries:	
Acclarent, Inc.	Delaware
ALZA Corporation	Delaware
Alza Development Corporation	California
Alza Land Management, Inc.	Delaware
Animas Corporation	Delaware
Biosense Webster, Inc.	California
Centocor Biologics, LLC	Pennsylvania
Centocor Research & Development, Inc.	Pennsylvania
CNA Development LLC	Delaware
Codman & Shurtleff, Inc.	New Jersey
Cordis Corporation	Florida
Cordis International Corporation	Delaware
Cordis LLC	Delaware
Cougar Biotechnology, Inc.	Delaware
Crescendo Pharmaceuticals Corporation	Delaware
Crucell Holdings Inc.	Delaware
DePuy, Inc.	Delaware
DePuy Mitek, Inc.	Massachusetts
DePuy Orthopaedics, Inc.	Indiana
International Subsidiaries:	
Apsis	France
Beijing Dabao Cosmetics Co., Ltd.	China
Berna Biotech Korea Corporation	Korea
Berna Rhein B.V.	Netherlands
Biosense Webster (Israel) Ltd.	Israel
Cilag Advanced Technologies GmbH	Switzerland
Cilag AG	Switzerland

Table 1 presents some summary statistics about the presence of firms in tax havens. 47 percent of the 3,695 firms included in the sample enter at least one tax haven for the first time at some point between 1993 and 2014. A country is defined as a tax haven if it appears on the list elaborated by Dyreng and Lindsey (2009), standard in the accounting literature. They constitute their list by simply crossing the classifications of the Organization for Economic Cooperation and Development (OECD), International Monetary Fund (IMF), the US Stop Tax Havens Abuse Act, and the Tax Research Organization (TRO) for 2008, and labeling a country as a tax haven if it appears at

least once. [2] In the same vein, around 47 percent of firms disclose no presence at all. The remaining 6 percent had at least one subsidiary in a tax haven over the entire period. These numbers are consistent with the view that profit shifting practices considerably developed in the 1990s and 2000s. They also indicate that, beyond data availability, the 1993-2014 is convenient to analyze the impact of profit shifting on employee pay. Half of firms establish a presence in tax havens ("switchers"), making it possible to compare these firms with firms never or always implanted in tax havens.

Figure 3 displays the distribution of compensations and total payments to non-executive employees for two types of firms: those familiar with tax havens and the others. The compensation of an executive encompasses the salary, bonuses, stock and option awards, long-term incentive plans, pensions, and all other pay. [3] Total payments to non-executive employees, for their part, are calculated as the difference between all payments to employees and compensations received by executives in the same year. [4] Altogether, the two graphs exhibit a positive correlation between presence in tax havens and employee pay. The correlation between profit shifting and compensation coincides with economic theory: executives, paid based on after-tax performance, are rewarded when their firm save taxes. On the opposite, the fact that payments to the other employees are higher in firms located in tax havens is at first sight not in line with the predictions of Krautheim and Schmidt-Eisenlohr (2016). Nonetheless, this correlation may simply stem from the existence of confounding factors: since firms in tax havens are larger and more productive, the correlation may have nothing to do with profit shifting activities *per se*. Put otherwise, investigating the effect of profit shifting on employee

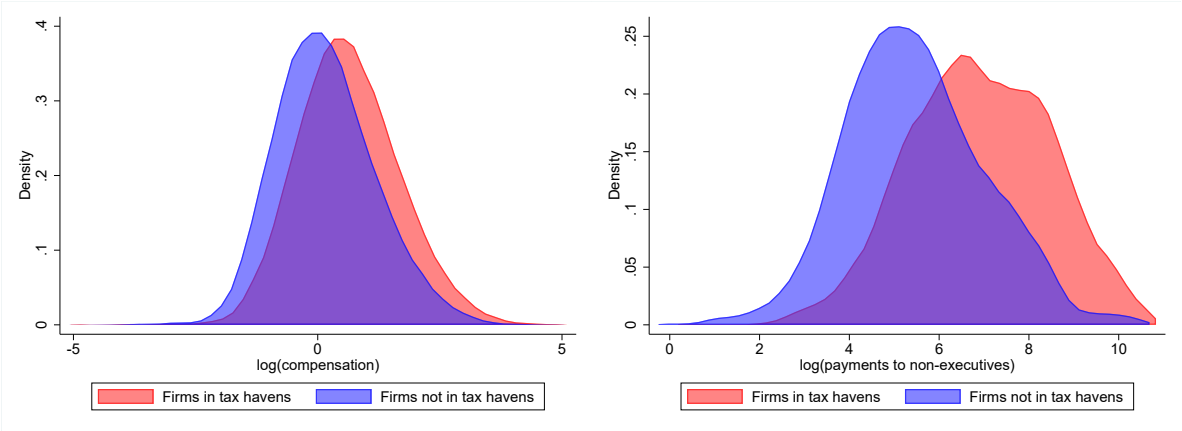
2. Their final list comprises 46 tax havens: Andorra, Anguilla, Antigua, Aruba, Bahamas, Bahrain, Barbados, Barbuda, Belize, Bermuda, Cayman Islands, Cook Islands, Costa Rica, Cyprus, Dominica, Gibraltar, Grenada, Guernsey, Hong Kong, Ireland, Isle of Man, Jersey, Lebanon, Liberia, Liechtenstein, Luxembourg, Macau, Malaysia, Malta, Marshall Islands, Mauritius, Monaco, Montserrat, Nauru, Netherlands Antilles, Niue, Panama, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, San Marino, Seychelles, Singapore, Switzerland, Turks and Caicos Islands, and Vanuatu.

3. This variable corresponds to the compensation variable $TDC1$ in ExecuComp. The calculation method of the $TDC1$ variable slightly changed in 2006 so I follow the correction procedure of Gabaix, Landier, and Sauvagnat (2014).

4. Payments to employees correspond to XLR in Compustat. Denote $compensation_{e,i,t}$ the compensation of executive e working for firm i in year t. As a result, payments to non-executive employees in firm i and year t are given by $XLR_{i,t} - \sum_e compensation_{e,i,t} = XLR_{i,t} - \sum_e TDC1_{e,i,t}$.

FIGURE 3 – Distribution of employee pay

(a) Compensations (b) Payments to non-executive employees



pay requires a more systematic approach.

3 Causal effect of profit shifting on employee pay

Section 3 delves into the link between profit shifting and employee pay. I start by clarifying the econometric exercise and identification strategy. Then, I expose and discuss the results.

3.1 Main equations

I assess the effect of profit shifting on employee pay with two distinct equations, as I differentiate between executives and non-executive employees.

The first equation is:

$$\begin{aligned} log(compensation_{e,i,t}) &= \alpha TH_{i,t} + \beta \mathbb{1}_{e,i,t}^{CEO,CFO} \times TH_{i,t} + \lambda X_{e,i,t} \\ &\quad + \upsilon_e + \phi_i + \psi_t + \epsilon_{e,i,t} \end{aligned} \tag{1}$$

The left-hand side variable $compensation_{e,i,t}$ is the compensation of executive e working

for S&P 1500 company i in year t. On the right-hand side, $TH_{i,t}$ is a dummy variable equal to one if firm i has at least one subsidiary located in a tax haven in year t. $\mathbb{1}_{e,i,t}^{CEO,CFO}$ is a binary variable equal to one if executive e is the CEO or the CFO of firm i in year t. I thus allow for heterogeneous effects. This possibility is motivated by the fact that CEO and CFO are the highest-ranking executives setting the "tone at the top" when it comes to tax strategies (Dyreng, Hanlon, and Maydew, 2010). Accordingly, these executives might be rewarded to a larger degree and the accent is placed on these C-level executives in the rest of the paper. To mitigate endogeneity, I insert a vector of controls and a battery of fixed effects. $X_{e,i,t}$ is composed of executives' age, firms' assets, sales, and pre-tax income (in logarithm),[5] and firms' number of foreign subsidiaries (in both non-haven countries and tax havens). The addition of firms' number of foreign subsidiaries into the set of independent variables ensures that the effect is specific to entry in tax havens. For their part, executive, firm, and year fixed effects absorb fixed characteristics of executives (e.g., education), systematic differences in compensations across companies, global trends in compensations, and year shocks. The coefficients of interest, α and β, transcribe the change in compensations (in percentage) following firm entry in tax havens. Their estimation requires variation in $TH_{i,t}$, i.e., switching firms. The identifying assumption is that, absent profit shifting and all else equal, compensations in treated and non-treated enterprises would have evolved similarly.

By the same token, I investigate the impact of firm entry in tax havens on wages of non-executive employees with the DiD equation:

$$log(paymentsNE_{i,t}) = \zeta TH_{i,t} + \lambda X_{i,t} + \phi_i + \psi_t + \epsilon_{i,t} \quad (2)$$

where $paymentsNE_{i,t}$ stands for all payments made by firm i in year t to non-executive employees. The independent variables mirror those introduced in equation (1), except

5. By construction, loss-making firms are ruled out. Nevertheless, the results are preserved if assets, sales, and pre-tax income are integrated without the logarithm transformation. Details are available upon request. Sales correspond to the variable denoted $SALE$, assets to the variable denoted AT, and pre-tax income to the variable equal to $PI - SPI$ (Compustat codes).

TABLE 2 – Benchmark results

	(1) $log(compensation_{e,i,t})$	(2) $log(paymentsNE_{i,t})$	(3) $log\left(\frac{compensation_{e,i,t}}{XLR_{i,t}/EMP_{i,t}}\right)$	(4) $log(EMP_{i,t})$
$TH_{i,t}$	-0.14^a	-0.04^b	-0.08	0.02^b
	(0.02)	(0.02)	(0.05)	(0.01)
$\mathbb{1}_{e,i,t}^{CEO,CFO} \times TH_{i,t}$	0.28^a		0.20^a	
	(0.01)		(0.03)	
Controls	Yes	Yes	Yes	Yes
Executive FEs	Yes	No	Yes	No
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Nb. of obs.	105,795	5,606	13,529	32,969

Notes. Standard errors, in parentheses, are clustered at the firm level. $^d p < 0.15$, $^c p < 0.10$, $^b p < 0.05$, $^a p < 0.01$.

that the vector $X_{i,t}$ includes only firm-specific controls this time because the analysis is performed at the firm × year level.

3.2 Results

The estimation results of equations (1) and (2) are respectively reported in table 2 columns (1) and (2). They indicate that the compensation of CEO and CFO grows by 14 percent as firms establish a presence in tax havens, while payments to non-executive employees fall by 4 percent. In columns (3) and (4), I demonstrate that CEO and CFO earnings expressed as a ratio of the firm's average wage increases by 12 percent and that, if anything, employment rises. It means that the decline in payments to non-executive employees cannot be mechanic and explained by job cuts.

I evaluate the robustness of these baseline results in table 3 and figure 4.

In table 3, I verify that revising the set of tax havens delivers the same results. It is worth bearing in mind that what defines a tax haven is not consensual in the literature. In fact, several classifications coexist. One reason is that having a low statutory corporate income tax rate is not a sufficient condition to be treated as a tax haven. Other

TABLE 3 – Robustness checks: alternative sets of tax havens

	(1)	(2)	(3)	(4)
	List of Hines and Rice (1994)		6 tax havens excluded	
	$log(compensation_{e,i,t})$	$log(paymentsNE_{i,t})$	$log(compensation_{e,i,t})$	$log(paymentsNE_{i,t})$
$TH_{i,t}$	-0.13^{a}	-0.03^{d}	-0.13^{a}	2.80e-4
	(0.02)	(0.02)	(0.02)	(0.02)
$\mathbb{1}_{e,i,t}^{CEO,CFO} \times TH_{i,t}$	0.28^{a}		0.26^{a}	
	(0.01)		(0.02)	
Controls	Yes	Yes	Yes	Yes
Executive FEs	Yes	No	Yes	No
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Nb. of obs.	105,805	5,606	105,712	5,606

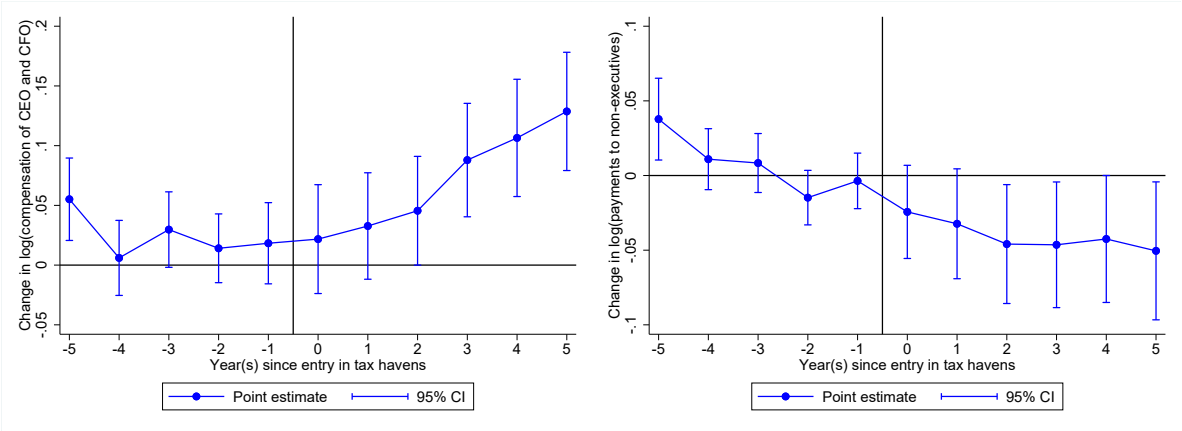
Notes. Standard errors, in parentheses, are clustered at the firm level. $^{d}p < 0.15$, $^{c}p < 0.10$, $^{b}p < 0.05$, $^{a}p < 0.01$.

criteria, such as secrecy and self-promotion as an offshore financial center, are determinant, and the weight associated to those sometimes differs. This is why I reproduce in columns (1) and (2) the results when adopting the classification proposed by Hines and Rice (1994). Their list is almost equivalent to the one of Dyreng and Lindsey (2009) with a few exceptions. Although the two lists share 35 tax havens, the classification of Dyreng and Lindsey (2009) is the only one to contain Aruba, Costa Rica, Guernsey, Jersey, Malaysia, Mauritius, Nauru, Niue, Samoa, San Marino, and Seychelles. Symmetrically, Hines and Rice (1994), unlike Dyreng and Lindsey (2009), incorporate the British Virgin Islands, Jordan, Maldives, Saint Martin, Channel Islands, and UK Caribbean Islands.[6] In the same spirit, I remove six tax havens in columns (3) and (4): Hong Kong, Ireland, Luxembourg, Malaysia, Singapour, and Switzerland. These countries are quite large and well-connected to the rest of the world, so saving taxes is probably not the unique objective of companies investing in these countries. On the opposite, FDI in small and remote islands such as the Bahamas and Jersey are more prone to be fully motivated by tax purposes. The results reported in table 3 globally match the benchmark ones, both stastically and economically. Hence, the inequality-deepening effect of profit shifting on employee pay is robust across classifications.

6. Due to data limitations, Channel Islands and UK Caribbean Islands are however omitted in the present analysis.

FIGURE 4 – Dynamics

(a) Compensations (b) Payments to non-executive employees



Notes. Standard errors are clustered at the firm level.

Figure 4 extends the results as it outlines the evolution of employee pay before and after firm entry in tax havens. To construct it, I enrich equations (1) and (2) with additional terms:

$$\begin{aligned} log(compensation_{e,i,t}) &= \sum_{k=0}^{5} \alpha_k TH_{i,t}^{t-k} + \sum_{k=0}^{5} \beta_k \mathbb{1}_{e,i,t}^{CEO,CFO} \times TH_{i,t}^{t-k} + \sum_{k=1}^{5} \gamma_k TH_{i,t}^{t+k} \quad (3) \\ &\quad + \sum_{k=1}^{5} \delta_k \mathbb{1}_{e,i,t}^{CEO,CFO} \times TH_{i,t}^{t+k} + \lambda X_{e,i,t} + \upsilon_e + \phi_i + \psi_t + \epsilon_{e,i,t} \\ log(paymentsNE_{i,t}) &= \sum_{k=0}^{5} \zeta_k TH_{i,t}^{t-k} + \sum_{k=1}^{5} \eta_k TH_{i,t}^{t+k} + \lambda X_{i,t} + \phi_i + \psi_t + \epsilon_{i,t} \quad (4) \end{aligned}$$

$TH_{i,t}^{t-k}$ is a dummy variable equal to one in year t if firm i has at least one subsidiary located in a tax haven in year $t-k$, and $TH_{i,t}^{t+k}$ is a dichotomous variable equal to one in year t if firm i has at least one subsidiary incorporated in a tax haven in year $t+k$. This collection of variables informs on the dynamics of the effect. In equation (3), $\alpha_0 + \beta_0$ reflects the immediate impact of firm entry in tax havens for CEO and CFO, $\alpha_0+\beta_0+\alpha_1+\beta_1$ translates the total impact for the same individuals after one year, and so on. They thus enable examining the evolution of compensations post entry. In this regard, the figure reveals that the effect on firm entry on employee pay is progressive

and becomes significant only after two years. After five years, the effect amounts to 14 percent for compensations of CEO and CFO and to -5 percent for wages of non-executive employees. The $TH_{i,t}^{t+k}$ variables are useful to analyze changes in compensations before entry in tax havens and the existence of pre-existing trends. Moreover, they can serve as a placebo test. The rationale is as follows: if the coefficients associated to these $TH_{i,t}^{t+k}$ variables are not statistically different from zero, the evolution of compensations does not depend on future profit shifting activities. Besides, note that in this case $TH_{i,t}^{t}$ is unlikely to be a proxy for past unobserved executive $\times$ firm $\times$ year shocks and reverse causality is not a major source of concern. The estimation results in figure 4 point in this direction. Overall, the $\hat{\gamma} + \hat{\delta}$ (left subfigure) and the $\hat{\eta}$ (right subfigure) are not significantly different from zero. Hence, employee pay does not significantly change before firms establish a presence in tax havens, which econometrically speaking backs up the parallel trends assumption crucial for the identification and more generally alleviates endogeneity issues. [7]

Relatedly, I investigate whether the results for equation (2) are due to the existence of negative weights. Earlier work suggests that the coefficient of interest ζ is equal to the expectation of a weighted sum of ATE. Some weights, however, could be negative. Therefore, if the constant effect assumption is violated and the effect varies across firms and/or periods, it is a priori possible to obtain a negative coefficient even if all ATE are positive. In accordance with the recommendations of de Chaisemartin and D'Haultfœuille (2020), I calculate the share of negative weights in the estimation of equation (2). Given that this share is only 11 percent, I conclude that this is not a problem in my set-up.

Before concluding, I explore the existence of non-linearities. MNE employ a wide array of methods to artificially shift profits from their affiliates in high-tax countries towards those in low-tax countries. One technique consists in locating strategically intellectual

7. I replicate figure 4 in the online appendix with the classification of Hines and Rice (1994) and the restricted set of tax havens (see figures A1 and A2).

TABLE 4 – The magnifying effect of intangible assets

	(1) $log(compensation_{e,i,t})$	(2) $log(paymentsNE_{i,t})$
$TH_{i,t}$	-0.09^a	-0.02
	(0.02)	(0.02)
$TH_{i,t} \times INTANGIBLES_{i,t}$	-0.24^a	-0.11^c
	(0.06)	(0.06)
$\mathbb{1}_{e,i,t}^{CEO,CFO} \times TH_{i,t}$	0.25^a	
	(0.02)	
$\mathbb{1}_{e,i,t}^{CEO,CFO} \times TH_{i,t} \times INTANGIBLES_{i,t}$	0.18^b	
	(0.08)	
Controls	Yes	Yes
Executive FEs	Yes	No
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
Nb. of obs.	105,790	4,059

Notes. Standard errors, in parentheses, are clustered at the firm level. $^d p < 0.15$, $^c p < 0.10$, $^b p < 0.05$, $^a p < 0.01$.

property rights. Intangible assets eases tax dodging through intra-firm royalty payments (Dischinger and Riedel, 2011; Karkinsky and Riedel, 2012; Griffith et al., 2014; Alstadsæter et al., 2018) and non-financial inter-company transactions like royalty payments account for most of profit shifting (Heckemeyer and Overesch, 2017). For these reasons, the effects presented so far could be larger in sectors using intangible assets intensively. I dig into this in table 4 where I add an independent variable that interacts $TH_{i,t}$ with $INTANGIBLES_{i,t}$. The latter denotes the industry-level (4-digit SIC) average intangible assets to total assets ratio. As expected, responses are indeed magnified in intangible-intensive sectors. To give an example, take two firms, A and B, both entering a tax haven at some point. A operates in a sector using no intangibles ($INTANGIBLES_{i,t} = 0$) and B is in a sector using exclusively intangible assets ($INTANGIBLES_{i,t} = 1$). Following entry in tax havens, column (2) reveals that non-executive employees from A would see total payments fall by 2 percent (if anything), while those working for firm B would experience a 13 percent loss in terms of total payments.

4 Conclusion

To the best of my knowledge, the effect of profit shifting on employee pay has been studied merely from a theoretical perspective. This paper bridges the gap between theory and data by means of an event study. Employing a rich database on S&P 1500 firms' financial statements, foreign subsidiaries, and executives, I observe how employee pay evolves before and after entry in tax havens. The results are three-fold. First, compensations of CEO and CFO increases when their firm establishes a subsidiary in a tax haven. Second, payments to non-executive employees, on the contrary, decline in the meantime. Last but not least, I find evidence of heterogeneous effects across sectors, these variations being more pronounced in intangible-intensive sectors. These findings can be rationalized and have interesting policy implications. By suggesting that profit shifting increases income inequalities, they highlight a new mechanism whereby globalization fosters income inequalities. Moreover, they lend credence to anti-tax avoidance measures as a tool to diminish income inequalities.

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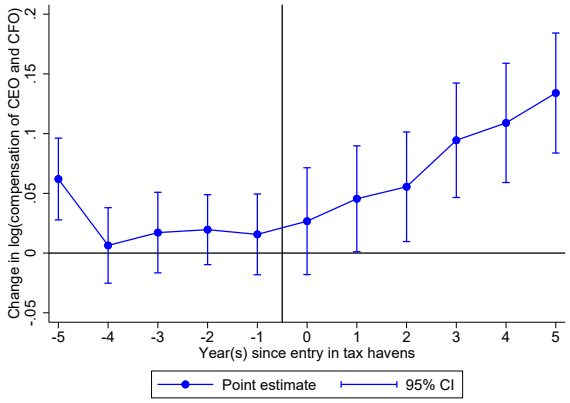
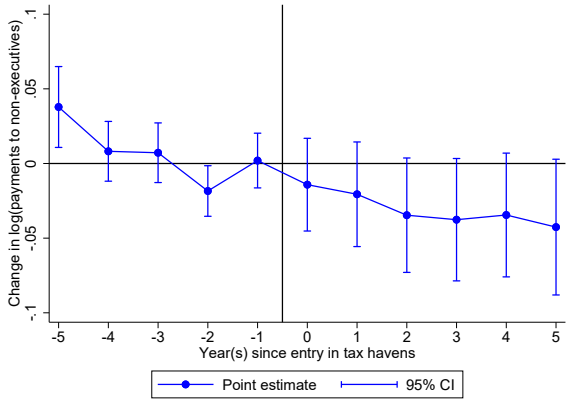
Online appendix

FIGURE A1 – Dynamics: list of Hines and Rice (1994)

(a) Compensations



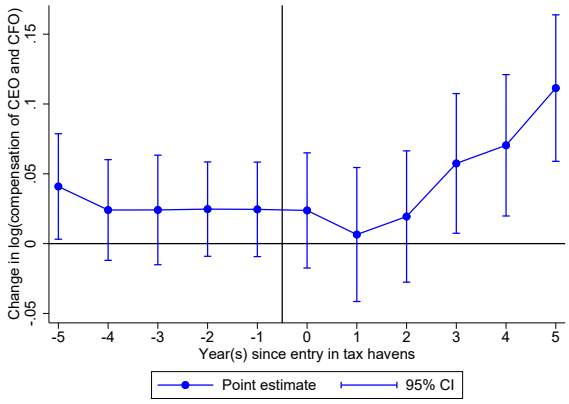
(b) Payments to non-executive employees



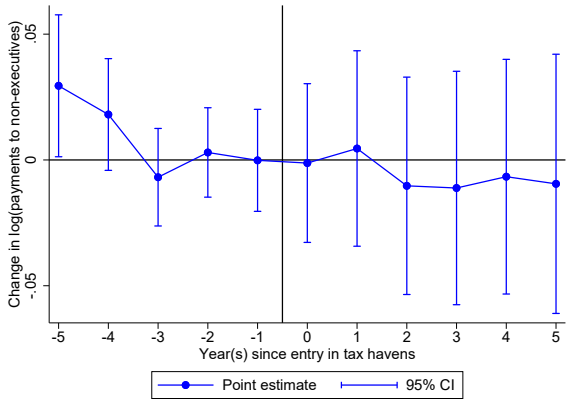
Notes. Standard errors are clustered at the firm level.

FIGURE A2 – Dynamics: restricted set of tax havens

(a) Compensations



(b) Payments to non-executive employees



Notes. Standard errors are clustered at the firm level.