OFFSHORING WAGE INEQUALITY IN TAX HAVENS*

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Abstract

We use matched employer-employee data on the universe of French firms to study the role of multinational enterprises' (MNEs) presence in tax havens in determining within-firm wage inequalities. We implement a difference-in-differences and a panel event-study design to analyze the effect of firm entry in tax havens on firms' wage variance. We find that the average firm wage variance experiences a drop by 4.7% over the immediate years following the establishment in a tax haven. We argue that wage inequality within MNEs with presence in tax havens is underestimated, due to the "salary split" for the highest wages of the firm. Indeed, we find that top 1% wages of the firm decline on average by 3.1% after the tax haven entry. On top of this, when we decompose the effects on the top 1%, we find a stronger wage decline due to the tax haven entry for the top salaries, as follows: a 4.4% decline for the top 0.5% and 4.8% for the 0.1% of top wages. The drop in wage variance is explained by a decline in wages at the top of the distribution and not by an effect on the rest of wages, on which there is no statistically significant effect. We show that these developments are exclusively related to tax haven foreign investment and not to other foreign investments. Finally, we introduce a methodology to estimate the macro-level effect of firm-level use of tax havens and we find that it represents around 2% of the observed change in the aggregate variance of wages.

JEL *classifications*: D33, F23, H26, H87, F66
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1 Introduction

It has been a decade since the launch of the BEPS project, a G20 initiative piloted by the OECD, aimed at combating tax avoidance by multinational enterprises (MNEs) worldwide. This effort, coupled with increased public awareness of tax avoidance due to numerous tax scandals—from the Offshore Leaks in 2013 to the Pandora Papers in 2021—has sparked significant interest in profit shifting within academic literature. Simultaneously, since the 2009 financial crisis, income inequality has been a central topic in both public and academic debates.

Thus, beyond its size, channels and determinants, a strand of the literature has focused on the effects of tax avoidance on inequality. First, tax avoidance generates an unequal tax burden among tax payers, which given the fact that it is concentrated among the richest individuals, it exacerbates existing inequalities ([**?**]). Second, given that the wealthy hold part their wealth in tax havens and that is very concentrated at the top, wealth inequality is highly underestimated [**?**]. On top of this, tax avoidance by MNEs can also have effects on inequality. The literature has mainly identified two channels through which tax haven usage by MNEs impacts within-firm wages and wage inequality ([**?**]). One the one hand, profit-shifting reduces workers wage bargaining power by artificially reducing domestic profits. On the other hand, lower corporate taxes translate into lower cost of capital, which in turn can increase rent sharing with workers -typically with top managers and higher skilled workers. The two effects combined, translate into higher wage inequality within the firm ([**?**] and [**?**]).

Various more or less sophisticated techniques, often bordering on legality, allow wealthy individuals and firms to pay little or no taxes. Among these techniques is the *salary split*, which involves receiving part or all of one's salary abroad. In this sense, this paper focuses on the *salary split* to propose a novel channel through which MNEs' usage of tax havens impacts the *measurement* of domestic within-firm wage inequalities.[1] MNEs and top wage employees use this technique, whereby a fraction of the salary is payed in the tax haven affiliate, in order to minimize domestic payroll and income tax liabilities, where the activity of the firm takes place. Beyond the novelty of this new channel on wage inequality mismeasurement, we propose a new methodology to estimate its aggregate impact. To the best of our knowledge, this paper is the first to quantify the macroeconomic mismeasurement of wage inequality linked to *salary shiting* to tax havens based on micro-econometric estimations.

Our results are summarized as follows. We use the universe of matched employer-employee French data over 1998 and 2014 and implement a difference-in-differences to show that firm wage variance declines on average by 4.7% when MNEs enter a tax haven. At the same time, top 1% wages of the firm decline on average by 3.1% after the tax haven entry, while no effect is found for other points in the distribution, lower than the p99. On top of this, when we decompose the effects on the top 1%, we find a stronger wage decline due to the tax haven entry for the top salaries, as follows: a 4.4% decline for the top 0.5% and 4.8% for the 0.1% of top wages. The higher the wage, the stronger the tax haven effect with the highest levels of statistical significance. In the absence of an exogenous shock, we implement an event-study design in order to inspect the existence of pre-trends and we find that our wage effects differ from control units only after "the treatment", the tax haven entry of the firm. On top of this, we show that these effects are exclusively related to tax haven foreign direct investment (FDI), while the opposite

[1] See: The "Salary Split" or the large-scale tax avoidance of employees, by Jonathan Chelet at https://www.capital.fr/economie-politique/le-salary-split-ou-l-evasion-fiscale-a-grande-echelle-pour-les-salaries-1116181

effects are found for all other FDIs, excluding tax havens. Last but no least, a placebo test, where we randomly assign the tax haven entry confirms that our results are only related to tax haven entry. At the aggregate level, we find that this overestimation of wage inequality at the firm level, represents around 2% of the observed change in the aggregate variance of wages in France between 1998 and 2014.

We rationalize these findings by arguing that there is a mismeasurement of top wages, as well as of wage variance (hence inequality) within the French firm, when she enters a tax haven. If firms decide to remunerate part of the wages of their top wage earners in a tax haven, it can significantly reduce its payroll taxes. Indeed, [**?**] have shown that over the past fifty years, France has significantly altered its payroll tax structure, transforming it into the most progressive part of its tax system. While payroll taxes are typically intended to finance social insurance rather than directly address redistribution, these changes have shifted the burden in a way that it enhances progressivity and top wages cost significantly more to the firm. This provides incentives for firms to pay part of their top wages in a tax haven affiliate. In practice, top wage employees receive a reduced salary in France and a supplementary amount paid in a foreign country with lighter taxation, where the company has a subsidiary. This allows firms to avoid heavy social charges, while employees benefit from a low tax rate on the portion of their salary paid abroad. Hence, salary split reduces the top wages paid in France and it artificially reduces the within-firm wage variance, as top wages decline with tax haven entry.

Implications of our findings is that tax haven usage by MNEs, reduce not only corporate taxes but also payroll taxes and personal income taxes for top salaries. In addition to underestimating within-firm wage inequality. The rest of the paper is organized as follows, next Section 2 presents our data sources, our baseline estimation strategy and the main results of the paper. Section 3 provides a robustness analysis of our baseline results. Section 4 presents the effects of the micro-level tax haven presence on the aggregate dispersion of wages in the French economy and section 5 concludes.

2 Empirical analysis

2.1 Data and stylized facts

Table 1 provides basic descriptive statistics based on the database that we construct by using several administrative data sources, which basically cover the universe of French firms and employees in the market economy over 1998 and 2014.[2] Out of the universe of firms, we carry out our empirical analysis on the universe of MNEs, both those who are and those who are not present in a tax haven at some point during period of analysis. The main message arising from these statistics is that, as predicted by international trade theory domestic firms largely differ from international firms, which are bigger, more productive and more intensive in skilled labor and intangible capital.[3] For the purpose of this paper, the main message that we wish to highlight from the descriptive statistics is that MNEs in tax havens and those that are not in tax havens, are also very different from one another. In particular they largely differ in terms of size, where tax haven MNEs more than double non tax haven MNEs in terms of employees

[2]The financial and the agriculture sector are not included. More specifically, Ficus-Fare is restricted to the Esane field units, hence it excludes agriculture (except 02) and finance (except 64.20Z and 66). For more details see: https://www.casd.eu/wp/wp-content/uploads/Support_Formation_FARE_FICUS_20220311.pdf.

[3]See: [**?**] and [**?**] for instance.

and almost double them in terms of sales. However, it is very likely that the latter number is underestimated given that shifting profits to tax havens is partly about sales-shifting.[4]

Table 1: Main descriptive statistics by type of firm

	Domestic	MNE non tax haven	MNE Tax haven	Mean	Median
Labor Share	0.76	0.83	0.83	0.76	0.74
ln TFP	-0.03	0.11	0.09	-0.03	-0.02
Labor productivity	36.65	62.03	63.62	37.00	30.10
Employees	10	154	371	13	3
Sales	1 758	44 114	73 454	2 503	285
Intangible shares	0.24	0.21	0.23	0.24	0.07
Share of skilled workers	0.07	0.27	0.26	0.06	0.00
Export intensity	0.02	0.20	0.18	0.02	0.00
N firms	2 302 261	33 302	18 490	-	-
N obs	17 555 154	178 269	79 724	-	-

Note: Sales in thousand euro, Labor product. (ALP) is real value added per hours worked.
ln TFP is constructed based on an index number approach (Caves et al. 1982).
Source: FICUS-FARE et LIFI.

Our data main data sources for firms domiciliated in France come from the FICUS and FARE bases and are made available by the French national statistical institute (INSEE) and the public finances directorate (DGFiP). These bases are drawn from fiscal files, and no firm size threshold determining the inclusion/exclusion is applied. Hence, there is full coverage of French firms, given that every firm is subject to compulsory reporting with fiscal authorities. The FICUS-FARE base contains balance sheet information such as on value added, employment, capital, depreciation, investment, the wage bill, four-digit sector the firm belongs to, etc... In addition, a unique firm identifier is associated to each firm (siren number) which is used to link it to other French databases (LIFI and DADS postes) which we use in order to get yearly information on the firms' bilateral presence in a foreign country (and in a tax haven) and on the detailed composition of the firms' wage distribution in France.

The LIFI data is the "financial linkages base" (Liaisons Financières) which comes from the INSEE. More specifically, it provides information about the composition of economic groups through firm's ownership relations (foreign and domestic) of companies residing in Metropolitan France and French overseas departments. Although the base has a good coverage, it is not exhaustive in the sense that it is constructed by applying different thresholds. More specifically, it includes firms verifying at least one of the following conditions: having more than 500 employees, holding equity securities above 1.2 million euro, having a turnover of more than 60 millions euro, being the parent of a group or being held by foreign capital in the previous year. The survey

[4]See for instance: [**?**].

is complemented with additional administrative sources (DIANE) in order to ensure a better coverage of smaller groups. The relevant information that we can extract from this base is the position of the firm within the group (parent, subsidiary), the list of subsidiaries abroad as well as their nationality, the nationality of the parent when a French firm is a subsidiary of a foreign company and the amount of direct participations of the main shareholders.

The DADS database postes (Déclaration annuelle de données sociales) which is provided by the INSEE, is based on mandatory annual reports filled by all firms with employees; it contains annual hours paid in a firm, as well as the number of workers employed by different socio-professional occupation types from which we obtain the detailed wage distribution of the firm. The use of this data is particularly interesting to study wage inequalities given that for each worker, it provides information on gross and net wages, hours paid, occupation, tenure, gender, age and the firm for which he/she works.

We are interested in assessing the effect of MNEs' usage of tax havens on firm wage dispersion and wages at different points in the firm wage distribution. In order to assess this, we construct our main variable of interest, tax haven presence, in such a way that it reflects both the situation where a French residing firm has a parent or an affiliate in a tax haven. For this, we classify countries according to their tax haven and non-tax haven status, with the help of the classification of offshore financial centers (OFC) as provided by the International Monetary Fund (IMF) and are listed in Table 2. This list has the advantage of being comprehensive and institutionally objective. However, this list specifically pertains to offshore financial centers in relation to the rules governing offshore financial instruments. Although there's a notable overlap between the legal frameworks facilitating offshore finance and those enabling corporate profit-shifting, the instruments identified aren't necessarily used by MNEs for tax planning. For this reason, as is common in the literature, in the future we plan to carry out robustness tests by using alternative lists. For the time being, we believe that the fact that the list is particularly comprehensive in relation to other lists, plays as an attenuation bias given that the tax haven effects that we expect are opposite to the effects of firm internationalisation (that is, becoming an MNE).[5]

Table 2: Tax haven jurisdictions as defined by the IMF

ANDORRA	DOMINICA	LIECHTENSTEIN	NIUE
ANGUILLA	GIBRALTAR	LUXEMBOURG	PANAMA
ANTIGUA AND BARBUDA	GRENADA	MACAU	NETHERLANDS
DUTCH ANTILLES	GUAM	MALAYSIA	PHILIPPINES
ARUBA	GUERNSEY	MALTA	SAINT LUCIA
BAHRAIN	HONG KONG	MAN (ISLAND)	WESTERN SAMOA
BARBADOS	IRELAND, or EIRE	NORTHERN MARIANA (ISLANDS)	SEYCHELLES
BELIZE	ISRAEL	MARSHALL ISLANDS	SINGAPORE
BERMUDA	JAPAN	MAURITIUS	SWITZERLAND
CAIMANS (ISLANDS)	JERSEY	MICRONESIA (FEDERATED STATES OF)	THAILAND
CYPRUS	JORDAN	MONACO	TURKS AND CAICOS (ISLANDS)
COOK (ISLANDS)	LEBANON	MONTSERRAT	URUGUAY
COSTA RICA	LIBERIA	NAURU	VANUATU
DJIBOUTI			

Source: Offshore Financial Centers (IMF, 2000). `www.imf.org/external/np/mae/oshore/2000/eng/back.htm`

[5]Alternative lists of tax havens that are common in the literature include the *academic* Dharmapala & Hines list ([**?**]) and the *NGO* list provided by Oxfam. The former captures the coexistence of a low tax rate and legal features prone to tax avoidance and classifies 41 countries as tax havens. The latter is based on multi-criteria and classifies 35 countries as tax havens.

2.2 Estimation strategy: Difference-in-differences

Using detailed French data on firm foreign presence by destination and on balance-sheet information and presence abroad over 16 years, we assess the effect of tax haven presence on within firm wage dispersion and across the within firm wage distribution in France. More specifically, using French firm-level data over 1998 and 2014, we implement a standard difference-in-differences (DiD) design with variation in firm entry in tax havens -our treatment variable, thus in treatment timing. Given that firms' entry in a tax haven happens in different periods, the control group is composed by those observations of firms in those years when firms were not present in a tax haven. Next, we scrutinize the identification strategy by inspecting the pre-treatment trends with the help of a panel event-study. Finally, in Section 3 we provide a robustness analysis (i) by assessing the effect of becoming an MNE (excluding tax havens) as the treatment variable, (ii) by assessing the baseline effects on an alternative control sample, including all MNEs and not only those who become tax haven MNEs at some point, and (iii) by implementing a placebo test.

2.2.1 Wage dispersion and wage distribution

Baseline specification. We run a two-way fixed effects model, where the identification comes from pure within-firm variation over time. More specifically, we estimate the following equation,

$$ln\, Y_{fst} = \beta_1\, \mathbb{1}[Tax\ haven_{ft}] \;+\; \alpha\, Z'_{ft} \;+ \delta_f + \delta_{st} + \epsilon_{ft} \tag{1}$$

Where Y_{fst} alternatively represents the within-firm wage variance and the different percentiles across the wage distribution of the firm (p10, p25, p50, p75, p90, p95) for firm f, belonging to sector s at year t. $\mathbb{1}[Tax\ haven_{ft}]$ is an indicator of whether firm f is present in a tax haven (either with a parent or an affiliate company) in year t and 0 otherwise. Z'_{ft} is a vector of time-varying firm-level controls, including a dummy variable for MNE status, and it is equal to 1 when firm f has a foreign presence (different from a tax haven) in year t and 0 otherwise, a dummy variable indicating presence in a low wage country,[6] the number of foreign affiliates that the firm has at time t and its export intensity. δ_f and δ_{st} are firm and 2-digit sector $\times$ year fixed effects. The former allow controlling for unobservable firm heterogeneity to the extent that it doesn't vary over time, while the latter account for aggregate shocks and trends that are common to all firms as well as those that are specific to each 2-digit sector, such as targeted regulations or demand and technology shocks that are sector specific. Finally, ϵ_{ft} is the robust standard error term. Given that our data cover the universe of MNEs and that our "treatment" variable of interest (i.e. presence in a tax haven) as well as the dependent variable are firm and time specific, we report robust standard errors and not clustered ones.[7]

Baseline results. Estimation results from our baseline analysis are presented in Table 3. Column (1) presents results for the wage variance and columns (2)-(6) for different wage percentiles, as follows: p10, p25, p50, p75, p90 and p95. The main message arising from Table 3 is that, there is a negative and statistically significant effect (at the 5% level of acceptance), which is

[6] We construct the variable indicating the the low wage country presence with the help of the classification of countries provided by [**?**]. The list of low wage countries is displayed in Table 10 in the Appendix.

[7] See [**?**] for a recent contribution to when and how standard errors be clustered should.

Table 3: Tax havens effect on wage dispersion and wage distribution

	ln var. wages	ln p10	ln p25	ln p50	ln p75	ln p90	ln p95
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1[Tax haven MNE]=1	-0.0486^{b}	-0.0108	0.00566	0.00688	0.00895^{c}	-0.00116	-0.00747
	(0.0189)	(0.00733)	(0.00493)	(0.00422)	(0.00461)	(0.00588)	(0.00673)
1[MNE]=1	0.0526^{b}	0.00669	-0.0156^{a}	-0.0105^{b}	-0.0117^{b}	-0.00966^{c}	-0.00312
	(0.0173)	(0.00665)	(0.00455)	(0.00388)	(0.00419)	(0.00542)	(0.00615)
1[MNE lwc]=1	0.0397	-0.0111	0.00915	0.00906	0.0152	0.000906	-0.0168
	(0.0539)	(0.0249)	(0.0177)	(0.0171)	(0.0177)	(0.0187)	(0.0192)
Num. affiliates	0.00550^{a}	0.000761	0.00163^{a}	0.00188^{a}	0.00262^{a}	0.00294^{a}	0.00311^{a}
	(0.00138)	(0.000655)	(0.000419)	(0.000336)	(0.000376)	(0.000416)	(0.000419)
Export intensity	0.0825^{b}	0.0135	0.0151	0.00452	0.00533	0.0267^{b}	0.0387^{b}
	(0.0334)	(0.0139)	(0.00987)	(0.00805)	(0.00887)	(0.0105)	(0.0119)
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	48827	49304	49304	49304	49304	49304	49304
Adjusted R^2	0.792	0.815	0.901	0.937	0.930	0.895	0.864

Standard errors in parentheses

^{c} $p < 0.10$, ^{b} $p < 0.05$, ^{a} $p < 0.001$

associated to a a tax haven entry. This tantamount to an average decline by 4.7% in within-firm wage inequality when an MNE enters a tax haven, with respect the years prior to the tax haven entry.[8] On top of this, no other effect of tax haven entry on other points of the wage distribution seem to take place. Indeed, besides column (5) which displays results for the p75, the coefficients associated to tax haven entry for the different wage percentiles are no statically different from zero. The tax haven entry coefficient associated to the p75 appears to be positive and significant at the 10% level of acceptance, but its magnitude is very close to zero (0.1%).

In sum wage variance is reduced by 4.7% with the tax haven entry and there seems not be an statistically significant effect on the bottom 95% of the wage distribution. One can therefore expect a decline in the upper end of the distribution, explaining the decline in wage variance. Next subsection assesses the tax haven entry effect on the top 1% of wages of the firm and it further decomposes the effect on the different quantiles of the top 1% of firm wages.

Before that, it is also convenient commenting the estimation results of the dummy variable indicating the MNE status (excluding tax havens) on wage dispersion and on the. bottom 95% of the wage distribution. Interestingly, the fact of becoming an MNE, excluding a tax haven, has the opposite effect of tax haven entry, where wage variance increases by 5.4%. On top of this, with varying levels of acceptance (between 1% and 10%), the fact of becoming an MNE (excluding tax havens) seems to translate into an slight decline, of around -1%, of wages of the

[8] Recall that the percentage effect of a dummy in a log-linearized dependent variable is given by: $100[exp(\beta)-1]$, where β is the estimated coefficient of the dummy variable.

middle 65% of employees within the firm. This effect is more pronounced and estimated with more precision for the middle 50% (from p25 to p75). This is consistent with previous work by [**?**] on French data. Indeed, they show that outward FDI translates into higher wage dispersion, as it raises manager wages and reduces wages for workers performing offshorable. Finally, it is interesting to note that the variable indicating the presence in a low wage country does not appear to have any effect on wage dispersion and wages, despite the fact that one can expect that offshored tasks affect wages of workers performing these tasks.[9] A plausible explanation of this lack of effect is that the MNE dummy captures part of this impact.

2.2.2 Effects on the firm top wages

In this subsection we test our central hypothesis, whereby top salaries decline with tax haven presence. We therefore re-estimate a DiD as in equation (1) on the top 1% wages and we decompose its effects by estimating the DiD on the different quantiles of the top 1% of the firm wages (top 0.5, top 0.4, top 0.3, top 0.2 and top 0.1) for firm f, belonging to sector s at year t. Results from these estimations are displayed in Table 4.

From Table 4 we can confirm that within-firm top wages decline with tax haven usage by MNEs. Column (1) shows that tax haven entry translates into an average 3.2% decline of top 1% wages within the firm. Columns (2)-(6) decompose this effect into the impact of tax haven entry on top 0.5%, 0.4%, 0.3%, 0.2% and 0.1% wages of the firm, respectively. Consistent with results in column (1) we find that all coefficients in columns (2)-(6) are negative and statistically significant at the highest levels of acceptance. We find an average drop by 4.4% of top 0.5% and top 0.4% wages, and an average decline by 4.8% in top 0.3%, 0.2% and 0.1% wages. The higher the wage, the higher the tax haven induced drop in the wage. Given the set of fixed effects included, these effects are robust to any unobserved heterogeneity across 2-digit sectors varying over time, such as sector specific any demand or technological shock and any change in regulation.

Finally, it is also interesting to note that the coefficient of becoming an MNE (excluding tax havens) appears to be positive and statistically significant at the highest levels of acceptance for all outcomes. They are also higher in magnitude than in the case of tax haven entry, and the difference increases with higher wages. These results are also consistent with results found in previous subsection, where MNE status appears to increase wage dispersion, and line with [**?**].

All in all, our results suggest that firm presence in a tax havens reduce firm wage dispersion, which seems to be explained by a decline in top wages. In the next subsection we scrutinize the identification strategy by inspecting the pre-treatment trends with the help of a panel event-study.

[9] See for instance [**?**] for evidence of offshored activities in low-wage countries and its effects on French wages.

Table 4: Decomposing tax haven effects on top 1%

	ln top 1%	ln top 0.5%	ln top 0.4%	ln top 0.3%	ln top 0.2%	ln top 0.1%
	(1)	(2)	(3)	(4)	(5)	(6)
1[Tax haven MNE]=1	-0.0321^a	-0.0449^a	-0.0444^a	-0.0494^a	-0.0483^a	-0.0489^a
	(0.00877)	(0.00920)	(0.00937)	(0.00949)	(0.00968)	(0.00992)
1[MNE]=1	0.0371^a	0.0475^a	0.0495^a	0.0560^a	0.0592^a	0.0635^a
	(0.00795)	(0.00834)	(0.00848)	(0.00860)	(0.00875)	(0.00898)
1[MNE lwc]=1	-0.0101	0.00231	0.00629	0.0123	-0.00165	0.0158
	(0.0252)	(0.0257)	(0.0258)	(0.0260)	(0.0267)	(0.0270)
Affiliates	0.00280^a	0.00302^a	0.00291^a	0.00293^a	0.00320^a	0.00299^a
	(0.000463)	(0.000507)	(0.000524)	(0.000542)	(0.000584)	(0.000666)
Export intensity	0.0629^a	0.0665^a	0.0699^a	0.0745^a	0.0789^a	0.0748^a
	(0.0150)	(0.0155)	(0.0157)	(0.0158)	(0.0158)	(0.0160)
Observations	49304	49304	49304	49304	49304	49304
adj. R^2	0.813	0.808	0.806	0.805	0.804	0.803

Standard errors in parentheses

^{c} $p < 0.10$, ^{b} $p < 0.05$, ^{a} $p < 0.001$

2.3 Dynamics: panel event-study design

Does the DiD design in which we rely, allow us making inference about causal effects of tax haven presence of MNEs? If unobserved confounders vary over time, our two-way fixed effect model will not fully control for bias due to omitted variables. Nonetheless, if one can show that trends in pre-treatment outcomes are the same for the control and the treated group, despite having different levels of the outcome prior to the treatment, one significantly alleviates concerns regarding omitted variables and alternative explanations. Thus, we rely on a panel event-study design to test whether the parallel trends assumption holds, so that the parameter associated to tax haven entry can get closer to a causal effect, as follows,

$$\begin{aligned} ln\, Y_{fst} = & \sum_{j=2}^{J} \sigma_j \, \mathbb{1}[Lag\ j]_{ft} + \sum_{k=1}^{K} \eta_t \, \mathbb{1}[Lead\ k]_{ft} \\ & + \alpha \, Z_{ft}^{'} + \, \delta_f + \delta_{st} + \epsilon_{ft} \end{aligned} \tag{2}$$

where $ln\, Y_{fst}$ alternatively represents the log of within-firm wage variance, the log of the top 1% of wages and the log of different different quantiles of the top 1% wages of the firm (top 0.5, top and top 0.1). We are interested in the impact of the $Event_f$, which is the switch from not being present in a tax haven to being present in a tax haven, where the set of dummy variables $Lag\ j$ and $Lead\ k$ denote the distance to the $Event_f$ of interest, which is the first entry in tax haven, are defined as follows,

$$\begin{aligned} (Lag\ J)_{st} &= \mathbb{1}[\, t \, \leq \, Event_f \, - \, J] \\ (Lag\ j)_{st} &= \mathbb{1}[\, t \, = Event_f - j] \; for \; j \, \in \{1, ..., J-1\} \\ (Lead\ k)_{st} &= \mathbb{1}[\, t \, = Event_f \, + \, k] \; for \; k \, \in \{1, ..., K-1\} \\ (Lag\ K)_{st} &= \mathbb{1}[\, t \, \geq \, Event_f \, + \, K] \end{aligned}$$

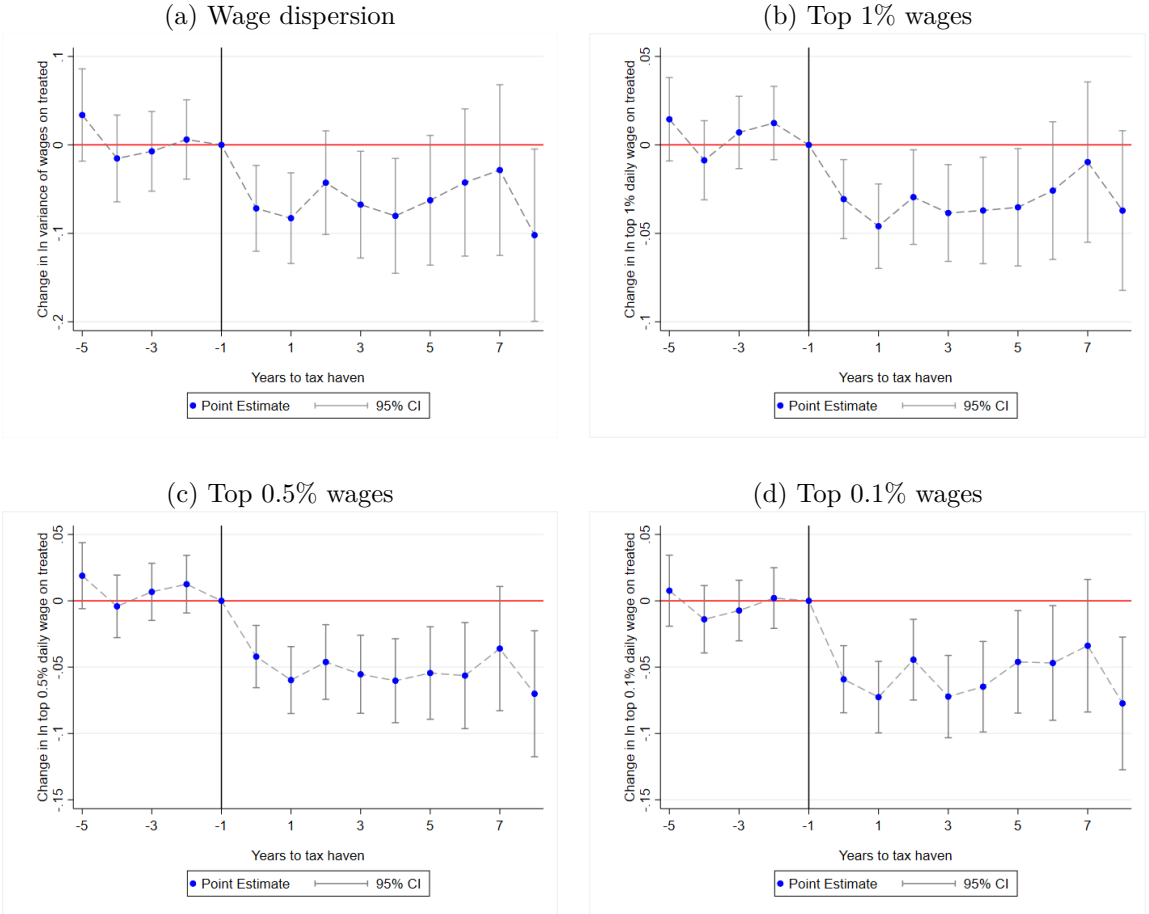
The final lags and leads accumulate lags and leads beyond periods J and K, in our case we set them equal to -6 and 9 years, respectively. As indicated in equation 2, the reference period with respect to which we compare the effect of tax haven entry is $j = 1$, which is the year before the event. As before, we include a set of time-varying observables in $Z^{'}$. If the conditional common trend assumption is verified, then the coefficients on the lags should not be significantly different from zero, in which case we could be confident about giving a causal interpretation to our estimated effects. The results from this estimation are displayed in Table 13 in the Appendix and are plotted in panels (a)-(d) in Figure 1. Each panel plots estimated coefficients of year dummies indicating the distance to the event of interest: entry in a tax haven, for each outcome of interest, Y_{fst}.

The first message arising from Table 13 and Figure 1 is that the results from the static version of the DiD in Tables 3 - 4 are consistent with the dynamic version of the DiD for each Y_{fst}. As before, within-firm variance and top wages decline when MNEs become tax haveners. Additionally, the absence of any clear pre-treatment trend for the wage variance and for the top wages, make us confident about the fact that our treatment captures the effect of entering a tax haven and not any other confounding effect. Although with varying levels of precision and with some non statistically significant post-treatment year coefficients, the tax haven effect remains largely

negative over time for all outcomes of interest, as shown in panels (a)-(d) in Figure 1.

Although the effect on wage dispersion is the outcome that is identified with less precision, as shown in panel (a), it is also the effect that appears to be the highest in magnitude as shown in column (1) in Table 13 in the Appendix. Estimation results suggest that wage dispersion displays an average drop by 14% (at the 5% level of acceptance) 9 years after the tax haven entry. In the case of wages, the coefficients indicating the distance to tax haven entry are estimated with more precision, as can be seen in panels (b)-(c). Additionally, consistent with the static DiD, the effects are stronger the higher the wage. Columns (2)-(4) in the Table 13 in the Appendix show that 9 years after the tax haven entry, top wages decline by 6.6%, by 9.9% and by 10.1% for top 1%, for top 0.5% and for top 0.1% wages, respectively. The three coefficients are statistically significant at the 1% level of acceptance.

Figure 1: Wage dispersion and top wages



Notes: Plot of estimated coefficients of year dummies indicating the distance to the event of interest: entry in a tax haven.

What can explain the fact that tax haven entry translates into lower wage dispersion and lower wages for top wage earners?

As mentioned earlier, our findings are consistent with a tax avoidance practice that is commonly known as *salary split*, where firms pay a portion of the wages - usually executive wages and wages at the top - in a tax haven. More specifically, top wage employees receive a reduced salary in France and a supplementary amount paid the tax haven, where the company has a subsidiary. This allows firms to avoid heavy social charges, while employees benefit from a low tax rate on the portion of their salary paid abroad. In this sense, salary split reduces the top wages paid in France and it artificially reduces the within-firm wage variance, as top wages decline with tax haven entry.

What are the incentives for MNEs to reduce top wages in a high tax country such as France? If firms decide to remunerate part of the wages of their top wage earners in a tax haven, it can significantly reduce its tax bill. Indeed, reducing top wages in France can reduce income taxes for top wage earners, but beyond this, the MNE can in particular, strongly reduce its payroll taxes. [**?**] have shown that over the past fifty years, France has significantly altered its payroll tax structure, transforming it into the most progressive part of its tax system. While payroll taxes are typically intended to finance social insurance rather than directly address redistribution, these changes have shifted the burden in a way that it enhances progressivity and top wages cost significantly more to the firm. This provides incentives for firms to pay part of their top wages in a tax haven affiliate.[10]

3 Robustness

In this section we provide a robustness analysis (i) by assessing the effect of becoming an MNE (excluding tax havens) as the treatment variable in subsection 3.1, (ii) by assessing the baseline effects on an alternative control sample, including all MNEs and not only those who become tax haven MNEs in subsection 3.2, and (iii) by implementing a placebo test in subsection 3.3.

3.1 Becoming an MNE (excluding tax havens)

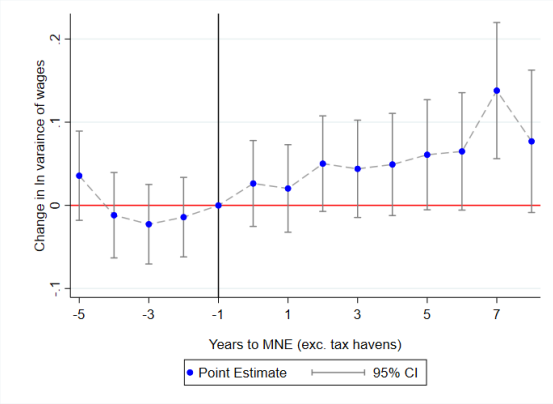
Given that the decision of entering a tax haven is far from exogenous, one way to provide evidence about the fact our results are linked to the tax advantages in tax havens, is by re-estimating our variables of interest and instead to focus on the tax haven entry, we focus on the moment where the firm becomes an MNE, excluding tax havens. We show that these developments associated to a decline in wage inequality in France such as those on top wages, are exclusively related to tax haven foreign investment and not to other foreign investments. Event-study results from this exercise are displayed in Panels (a)-(d) in Figure 2, where we replace the "event", and instead of considering the distance to the tax haven entry we assess effect of the distance to becoming an MNE (not including tax haven countries).

The findings from this analysis indicate that the observed reduction in wage dispersion and the decline in top wages (top 1%, top 0.5%, and top 0.1%) disappear when considering foreign direct investment (FDI) in countries other than tax havens. In contrast, a slight increase in wage variance (not statistically significant in most years) and a significant increase in top wages

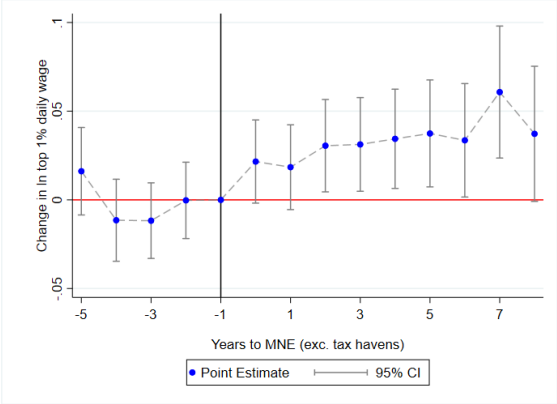
[10]Salary split, has long been known and used by large firms, but it gained prominence in France with François Hollande's 75% tax on incomes over 1 million euros, which was in place in 2013 and 2014.

Figure 2: Wage dispersion and top wages

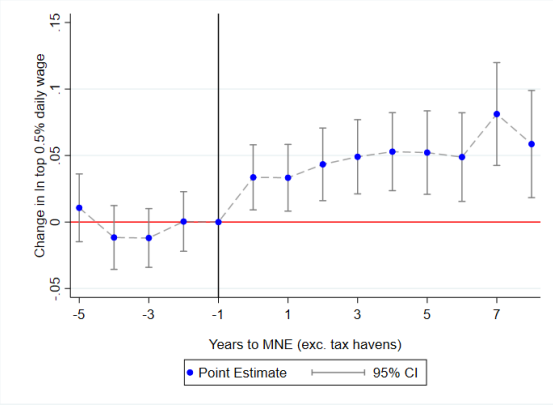
(a) Wage dispersion



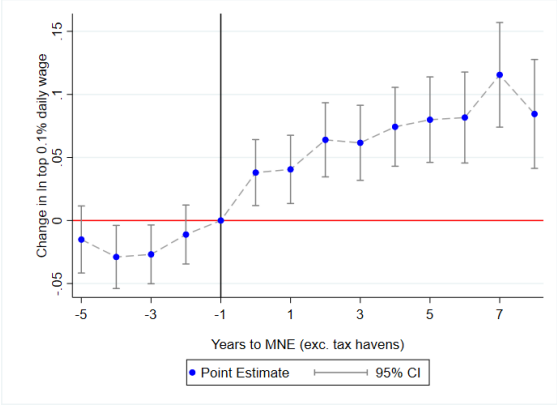
(b) Top 1% wages



(c) Top 0.5% wages



(d) Top 0.1% wages



Notes: Plot of estimated coefficients of year dummies indicating the distance to the event of interest: becoming an MNE (excluding tax havens).

(positive and significant since the event) are observed when a firm transitions into a multinational enterprise (excluding tax havens). Similar to the tax haven scenario, the effects are more pronounced at higher points in the wage distribution (the highest for the top 0.1%, and higher for the top 0.5% than for the top 1%). Note that different from the tax haven event studies, the top 0.1% wage effect of becoming an MNE displays a pre-trend. This means that our variables of interest is co-determined with becoming an MNE. Whereas in the case of the tax haven entry, we are capturing the effects of the tax haven entry decision, given the absence of pre-trends.

3.2 Alternative sample: All MNEs

Although, as shown in the descriptive statistics section in Table 1, tax haven MNEs are very different from MNEs that never enter tax havens (they are particularly much larger in size), for the sake of robustness, we provide an alternative control group for the analysis by including those observations of MNEs that never enter a tax haven. Instead of comparing observations of MNEs that enter a tax haven with those of MNEs that are not yet in a tax haven (but will be at some point), in this subsection we compare them with MNEs that are never present in a tax haven. These estimation results are displayed in Tables 5 - 6.

Table 5: Tax havens effect on wage dispersion and wage distribution: all MNEs

	ln var. wages	ln p10	ln p25	ln p50	ln p75	ln p90	ln p95
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1[Tax haven MNE]=1	-0.0185^{b}	-0.000397	0.00187	0.00180	0.00160	-0.00436^{c}	-0.0103^{a}
	(0.00783)	(0.00317)	(0.00219)	(0.00181)	(0.00195)	(0.00234)	(0.00263)
1[MNE]=1	0.0650^{a}	0.0000877	-0.00157	0.000227	0.00413^{a}	0.0134^{a}	0.0222^{a}
	(0.00474)	(0.00193)	(0.00137)	(0.00109)	(0.00119)	(0.00141)	(0.00158)
1[MNE lwc]=1	0.107^{a}	0.00483	0.00533	0.0237^{b}	0.0360^{a}	0.0228^{b}	0.0127
	(0.0291)	(0.0121)	(0.00945)	(0.00779)	(0.00825)	(0.00908)	(0.00974)
Num. affiliates	0.00798^{a}	0.000500	0.00124^{a}	0.00151^{a}	0.00273^{a}	0.00350^{a}	0.00378^{a}
	(0.000845)	(0.000348)	(0.000235)	(0.000206)	(0.000244)	(0.000283)	(0.000297)
Export intensity	0.0554^{a}	0.0123^{b}	0.0147^{a}	0.0115^{a}	0.00456	0.0164^{a}	0.0263^{a}
	(0.0128)	(0.00528)	(0.00385)	(0.00311)	(0.00341)	(0.00395)	(0.00432)
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	379738	390214	390217	390218	390218	390218	390218
Adj. R^2	0.789	0.791	0.877	0.922	0.918	0.893	0.871

Standard errors in parentheses

^{c} $p < 0.10$, ^{b} $p < 0.05$, ^{a} $p < 0.001$

The main message arising from Table 5 and Table 6 is that our main findings remain robust in terms of signs and statistical significance to the alternative definition of the control group. That is that tax haven entry reduces firm wage dispersion as well as top wages of the firm.

Table 6: Decomposing tax haven effects on top 1% : all MNEs

	ln top 1%	ln top 0.5%	ln top 0.4%	ln top 0.3%	ln top 0.2%	ln top 0.1%
	(1)	(2)	(3)	(4)	(5)	(6)
1[Tax haven MNE]=1	-0.0131^{a}	-0.0135^{a}	-0.0138^{a}	-0.0139^{a}	-0.0124^{a}	-0.0117^{b}
	(0.00327)	(0.00343)	(0.00347)	(0.00351)	(0.00356)	(0.00360)
1[MNE]=1	0.0414^{a}	0.0448^{a}	0.0460^{a}	0.0467^{a}	0.0471^{a}	0.0478^{a}
	(0.00195)	(0.00203)	(0.00205)	(0.00208)	(0.00209)	(0.00212)
1[MNE lwc]=1	0.0118	0.0196^{c}	0.0195^{c}	0.0235^{b}	0.0175	0.0197
	(0.0114)	(0.0117)	(0.0118)	(0.0118)	(0.0119)	(0.0120)
Num. affiliates	0.00396^{a}	0.00395^{a}	0.00390^{a}	0.00380^{a}	0.00394^{a}	0.00394^{a}
	(0.000307)	(0.000312)	(0.000313)	(0.000318)	(0.000328)	(0.000351)
Export intensity	0.0519^{a}	0.0541^{a}	0.0547^{a}	0.0547^{a}	0.0564^{a}	0.0556^{a}
	(0.00504)	(0.00524)	(0.00530)	(0.00534)	(0.00537)	(0.00541)
Firm F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	390218	390218	390218	390218	390218	390218
Adj. R^2	0.830	0.824	0.823	0.821	0.821	0.820

Standard errors in parentheses

^{c} $p < 0.10$, ^{b} $p < 0.05$, ^{a} $p < 0.001$

Notwithstanding these results, the coefficient magnitudes are now around 3 times smaller than before. Nonetheless, the negative effect on top wages is now also visible since the top 5% of wages. While the negative coefficient on the top 10% is now significant at the 10% level of acceptance, its magnitude is very close to zero (-0.4%).

3.3 Placebo test

An extremely simple but equivalently helpful supplementary check consists in re-estimating equation 1 and artificially re-defining the "treatment" variable of interest in such a way that it is not related to the original treatment. The interest of doing this is that in case the estimated coefficients on the placebo treatment were similar or pointed in the same direction as our benchmark regressions, it would mean that our tax haven dummy fails to capture our effect of interest, namely, MNEs' tax avoidance. The results from this test are displayed in Tables 7-8, for the wage variance, the different wage percentiles and the top wages.

The main message that arises from this exercise is that the placebo tax haven dummy does not appear to be significant anymore at any level of acceptance for any of the different variables of interest. This suggests, therefore, that the entry in a tax haven does capture MNEs' tax avoidance and that it artificially reduces domestic wage dispersion as well as top wages (in France).

Table 7: Placebo effect on wage dispersion and wage distribution

	ln var. wages	ln p10	ln p25	ln p50	ln p75	ln p90	ln p95
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.tax_placebo	-0.00219	-0.00291	-0.00197	-0.00160	-0.00276	-0.000756	0.000356
	(0.00826)	(0.00312)	(0.00209)	(0.00162)	(0.00180)	(0.00243)	(0.00289)
1.MNE	0.0304^{b}	0.000943	-0.0104^{b}	-0.00354	-0.00286	-0.00702^{c}	-0.00485
	(0.0129)	(0.00497)	(0.00334)	(0.00263)	(0.00285)	(0.00376)	(0.00442)
1.MNE_lwc	0.0362	-0.0137	0.00234	0.00208	0.00988	-0.00382	-0.0199
	(0.0531)	(0.0241)	(0.0167)	(0.0156)	(0.0162)	(0.0176)	(0.0185)
affil	0.00498^{a}	0.000511	0.00141^{a}	0.00162^{a}	0.00237^{a}	0.00269^{a}	0.00287^{a}
	(0.00134)	(0.000650)	(0.000394)	(0.000304)	(0.000348)	(0.000369)	(0.000385)
exp_int	0.0783^{b}	0.0141	0.0148	0.00486	0.00438	0.0261^{b}	0.0365^{b}
	(0.0338)	(0.0139)	(0.00967)	(0.00776)	(0.00869)	(0.0104)	(0.0119)
N	48205	48653	48653	48653	48653	48653	48653
adj. R^2	0.793	0.816	0.904	0.941	0.934	0.898	0.866

Standard errors in parentheses

^{c} $p < 0.10$, ^{b} $p < 0.05$, ^{a} $p < 0.001$

Table 8: Decomposing placebo effects on top 1%

	ln top 1%	ln top 0.5%	ln top 0.4%	ln top 0.3%	ln top 0.2%	ln top 0.1%
	(1)	(2)	(3)	(4)	(5)	(6)
1[Tax haven MNE]=1						
	(0.00877)	(0.00920)	(0.00937)	(0.00949)	(0.00968)	(0.00992)
1[MNE]=1	0.0371[a]	0.0475[a]	0.0495[a]	0.0560[a]	0.0592[a]	0.0635[a]
	(0.00795)	(0.00834)	(0.00848)	(0.00860)	(0.00875)	(0.00898)
1[MNE lwc]=1	-0.0101	0.00231	0.00629	0.0123	-0.00165	0.0158
	(0.0252)	(0.0257)	(0.0258)	(0.0260)	(0.0267)	(0.0270)
Affiliates	0.00280[a]	0.00302[a]	0.00291[a]	0.00293[a]	0.00320[a]	0.00299[a]
	(0.000463)	(0.000507)	(0.000524)	(0.000542)	(0.000584)	(0.000666)
Export intensity	0.0629[a]	0.0665[a]	0.0699[a]	0.0745[a]	0.0789[a]	0.0748[a]
	(0.0150)	(0.0155)	(0.0157)	(0.0158)	(0.0158)	(0.0160)
Observations	49304	49304	49304	49304	49304	49304
adj. R^2	0.813	0.808	0.806	0.805	0.804	0.803

Standard errors in parentheses

[c] $p < 0.10$, [b] $p < 0.05$, [a] $p < 0.001$

4 From Micro to Macro: Aggregate wage variance

Given that MNEs and particularly those with a presence in tax havens are on average very big firms who are responsible for a significant share of total sales, employment and value added, one should expect changes happening within these firms to affect aggregate changes as well.[11] Indeed, international markets are highly granular, as firms engaged in internationalization tend to be very large ([**?**], [**?**]), and this process further amplifies their size ([**?**], [**?**]). Moreover, [**?**] show that tax avoidance contributes to sales concentration, indicating that offshore profit-shifting enables firms to grow even larger. In line with this, it is a well established fact that MNEs activity in tax havens distorts aggregate statistics (e.g. [**?**] and [**?**] for the case of France). This section aims at assessing the share of the aggregate wage dispersion that can be explained by micro-level fiscal optimization of MNEs. We do so with the help of the micro-level regression results from the previous section.

Let $y_{i,j,t}$ be the log-wage of worker i in firm j at date t. Let $\Omega^q_{j,t}$ be the set of workers which belong to the q-th quantile of log-wages in firm j and $N^q_{j,t} \approx \frac{1}{q} N_{j,t}$ the cardinal of this set (the approximation comes from the fact that the quantiles may not all have the exact same number of workers). Hereafter, we drop subscript t. We define

$$\begin{cases} \mu^q_j \equiv \frac{1}{N^q_j} \sum_{i \in \Omega^q_j} y_{i,j} \\ \sigma^q_j \equiv \frac{1}{N^q_j} \sum_{i \in \Omega^q_j} \left(y_{i,j} - \mu^q_j \right)^2 \end{cases}$$

to be the mean and variance of log wages within a firm $\times$ quantile. Accordingly, σ is the overall variance and μ the overall mean. From the law of total variance

$$\sigma = \sum_{j,q} \frac{N^q_j}{N} \sigma^q_j + \sum_{j,q} \frac{N^q_j}{N} \left(\mu^q_j - \mu \right)^2 \tag{3}$$

$$\text{with} \quad \mu = \sum_{j,q} \frac{N^q_j}{N} \mu^q_j \tag{4}$$

$$\text{and} \quad N = \sum_{j,q} N^q_j \tag{5}$$

$$\sigma = \sum_{j} \frac{N_j}{N} \sigma_j + \sum_{j} \frac{N_j}{N} \left(\mu_j - \mu \right)^2 \tag{6}$$

In words, the aggregate variance is equal to average variance of wages within firm $\times$ quantile plus the variance of the average wages between firm $\times$ quantile. [12]

[11] See descriptive statistics in Table 1 for more details.

[12] We could further decompose the second term of (3) into a within-firm, between quantiles variance and a between-firm within quantile variance.

$$\sum_{j,q} \frac{N^q_j}{N} \left(\mu^q_j - \mu \right)^2 = \sum_{j} \frac{N_j}{N} var(\mu^q_j | j) + \sum_{j} \frac{N_j}{N} \left(\mu_j - \mu \right)^2 \tag{7}$$

So in total there would be a within-quantile inequality, a between quantile inequality and a between firm inequality.

We want to obtain a counterfactual for σ. To this end, we need counterfactual values for the different elements of (3). Let $\hat{x}$ be the counterfactual value of variable x, if firms had no access to tax havens. For firms going to tax havens:

$$\hat{\mu}_j^q = \mu_j^q + \beta_q^\mu$$
$$\hat{\sigma}_j^q = \sigma_j^q + \beta_q^\sigma$$
$$\hat{N}_j^q = N_j^q + \beta_q^N$$

Where β_q^x is the DiD estimate of the impact of tax havens on $x_{j,t}^q$, $x = \{\mu, \sigma, N\}$. Instead of estimating three DiD, one could be willing to assume that some or all of the DiD effects are zero, hence shutting some of the channels through which tax havens may impact the aggregate variance. For instance, one may assume that $\beta_q^N = 0$, which amounts to shutting down the effect of tax havens on the aggregate variance through the reallocation of labor across firms. For the non-tax haven firms, the counterfactual values are equal to the actual ones. This means that we need three DiD estimates at the firm $\times$ quantile level in order to compute all the channels through which tax haven presence of firms impacts aggregate wage variance. However, our micro-level estimates from Section 2.2 are obtained at the level of the firm. Hence, in order to obtain a counterfactual for σ we can alternatively counterfactual values for the different elements of (6). For firms going to tax havens:

$$\hat{\mu}^j = \mu^j + \beta^\mu$$
$$\hat{\sigma}^j = \sigma^j + \beta^\sigma$$
$$\hat{N}^j = N^j + \beta^N$$

From our baseline results in Table 3 we know that the tax effect effect on the firm level variance is -4.7%. Hence, if firms had not been present in tax havens, firm-level variance would haven been $\hat{\sigma}^{j,t} = \sigma^{j,t} \times 1.047$. In other words, we plug back the tax haven loss in firm-level wage variance for each firm that was present in a tax haven over the sample period. As mentioned above, we could shut down the additional tax haven channels that influence σ in equation 6 and assume that $\hat{\mu}^{j,t}$ and $\hat{N}^{j,t}$ are equal to zero. Both of these effects have been estimated before in [**?**] and she finds that tax haven entry has no effect on average wages and that it translates into a decline in the number of employees in the firm. Hence, in order to assess these additional tax haven channels, Table 15 in the appendix displays regression results for the average wages of the firm and the number employees, where $\hat{\mu}^{j,t} = 0$ and $\hat{N}^{j,t} = -0.0849$.

Finally, note that this methology could allow computing the aggregate effect of other many firm level changes which could be of interest, such as the decision to delocalize activity to low-wage countries. Additionally it is flexible enough to work at the level of the quantile $\times$ firm level or the level of the firm.

Table 9: Observed and Predicted Aggregate Wage Variance

Var_{97}	Var_{14}	$\Delta Var_{_{97-14}}$	$\widehat{Var}_{14}$	$\Delta\widehat{Var}_{97-14}$
0.42359	0.46028	0.03669	0.46098	0.03739

Source: Authors' calculations using LIFI and FICUS-FARE databases.

Our main results for the mico-level effect of tax haven firm presence on the aggregate variance are displayed in Table 9, where we compute $\hat{\sigma}$ with the help of the three DiD estimates ($x^q_{j,t}$, $x = \{\mu, \sigma, N\}$). Column (1) displays the wage aggregate in 1998; Column (2) the aggregate wage variance in 2018; Column (3) the change over the sample period; Column (5) the estimated aggregate wage variance in 2014 if firms had not been present in tax havens; and Column (5) the estimated aggregate difference. The main message that can be drawn from Table 9 is that aggregate wage dispersion increased over the period and that contribution of tax haven presence to this increase, which we argue is a mismeasurement issue, represents around 2% of the observed change.[13][14] Even if the effect does not seem necessarily very big, one has to remember that this effect is driven by 0.33% of observations in 2014 and estimated from transitions from non tax haven presence into tax haven presence, which tantamount to only 0.12% of the sample (see Tables 11 - 12 in the Appendix). Note also that we estimate a lower bound of the underestimation of wage variance due to firm tax haven presence given that our effect only captures the extensive margin of the effect and not the intensive margin as we don't account for the contribution of firms that were already in a tax haven at the begining of the sample.

Finally, more than the intensity of the results, it is the direction of the effect that warrants emphasis. Intuitively, it may seem that establishing a subsidiary in a tax haven—facilitating greater profit shifting—would lead to an increase in the salaries of top executives within firms. This is, in fact, what[**?**] and [**?**] observe. Ultimately, this would be expected to lead to a rise in wage inequality. Demonstrating that this is not the case, and that tax havens may instead be used to obscure part of top executives' compensation, provides additional support to recent literature suggesting that the opacity surrounding tax havens serves purposes beyond mere profit shifting.

More broadly, this finding reinforces the idea that tax havens introduce noise into various types of economic measurement. While it is now widely recognized that this applies to profit measurement—and relatively well understood in the context of GDP, productivity [**?**], and value-added distribution [**?**]— it is less expected that tax havens would also distort measures such as wage inequality. This highlights the need to further investigate mismeasurements arising from the interposition of tax havens. In the specific case of France, this also leads to a discussion on a unique and somewhat surprising characteristic, despite the insights provided by the literature in attempting to understand its determinants [**?**]: France stands out as the only industrialized country where wage inequality has decreased, whereas all others have experienced an increase. If part of the salaries paid to top executives is recorded in tax havens rather than in France, it

[13]Naturally, if we shut down the employment channel, we would observe a lower effect. The tax haven contribution to aggregate wage variance would represent 1% of the observed change

[14]This effect is calculated as follows: $(0.46098 - 0.46028)/0.03669 = 0.01908$.

raises the question of to what extent this offshoring could at least partially explain this singular trend.

To further our analysis, we now aim to panelize the data using the methodology developed by [**?**]. This approach allows for tracking individuals over two consecutive years, which is not initially possible with the data at hand. As previously mentioned, our data focus on job positions rather than workers, meaning there is no unique identifier to follow the same worker over time. By implementing this methodology, we will formally rule out the possibility of a composition effect.

5 Conclusion

The literature has mainly identified two channels through which tax haven usage by MNEs impacts within-firm wages and wage inequality. One the one hand, profit-shifting reduces workers wage bargaining power by artificially reducing domestic profits. On the other hand, lower corporate taxes translate into lower cost of capital, which in turn can increase rent sharing with workers -typically with top managers and higher skilled workers. The two effects combined, translate into higher wage inequality within the firm. This paper proposes a novel channel, the "salary split", through which MNEs' usage of tax havens impacts the *measurement* of within-firm wage inequalities. MNEs and top wage employees use this technique, whereby a fraction of the salary is payed in the tax haven, where the firm has an affiliate, in order to minimize payroll and income tax liabilities, where the activity of the firm takes place.

Our results are summarized as follows. We use the universe of matched employer-employee French data over 1998 and 2014 and implement a difference-in-differences to show that firm wage variance declines on average by 4.7% when MNEs enter a tax haven. At the same time, top 1% wages of the firm decline on average by 3.1% after the tax haven entry, while no effect is found for other points in the distribution, lower than the p99. On top of this, when we decompose the effects on the top 1%, we find a stronger wage decline due to the tax haven entry for the top salaries, as follows: a 4.4% decline for the top 0.5% and 4.8% for the 0.1% of top wages. The higher the wage, the stronger the tax haven effect with the highest levels of statistical significance. In the absence of an exogenous shock, we implement an event-study design in order to inspect the existence of pre-trends and we find that our wage effects differ from control units only after "the treatment", the tax haven entry of the firm. On top of this, we show that these effects are exclusively related to tax haven foreign direct investment, while the opposite effects are found for all other FDIs, excluding tax havens. Last but no least, a placebo test, where we randomly assign the tax haven entry confirms that our results are only related to tax haven entry.

We argue that there is a mismeasurement of top wages, as well as of wage variance (hence inequality) within the French firm, when she enters a tax haven. If firms decide to remunerate part of the wages of their top wage earners in a tax haven, it can significantly reduce its payroll taxes. Previous literature has shown that over the past fifty years, France has significantly altered its payroll tax structure, transforming it into the most progressive part of its tax system. While payroll taxes are typically intended to finance social insurance rather than directly address redistribution, these changes have shifted the burden in a way that it enhances progressivity and top wages cost significantly more to the firm. This provides incentives for firms to pay part of their top wages in a tax haven affiliate. In practice, top wage employees receive a reduced salary in France and a supplementary amount paid in a foreign country with lighter taxation, where the company has a subsidiary. This allows firms to avoid heavy social charges, while employ-

ees benefit from a low tax rate on the portion of their salary paid abroad. Hence, salary split reduces the top wages paid in France and it artificially reduces the within-firm wage variance, as top wages decline with tax haven entry. Finally, we introduce a methodology allowing us to map our macro estimates to the aggregate effect on wage variance. At the aggregate level, we find that this overestimation of wage inequality at the firm level, represents around 2% of the observed change in the aggregate variance of wages in France between 1998 and 2014.

Implications of our findings is that tax haven usage by MNEs, reduce not only corporate taxes but also payroll taxes and personal income taxes for top salaries. In addition to underestimating within-firm wage inequality.

Appendix A Appendix

A.1 Additional tables

Table 10: Low-wage countries from Bernard et al. (2006)

Afghanistan	China	India	Pakistan
Albania	Comoros	Kenya	Rwanda
Angola	Congo	Lao PDR	Samoa
Armenia	Equatorial Guinea	Lesotho	Sao Tome
Azerbaijan	Eritrea	Madagascar	Sierra Leone
Bangladesh	Ethiopia	Malawi	Somalia
Benin	Gambia	Maldives	Sri Lanka
Bhutan	Georgia	Mali	St. Vincent
Burkina Faso	Ghana	Mauritania	Sudan
Burundi	Guinea	Moldova	Togo
Cambodia	Guinea-Bissau	Mozambique	Uganda
Central African Rep	Guyana	Nepal	Vietnam
Chad	Haiti	Niger	Yemen

Note: Low-wage countries dummy takes the value of one when the country's per capita GDP is less than 5% of U.S. per capita GDP (lwc throughout the whole period).

Table 11: Transitions from not having to having foreign presence in a tax haven

	Dummy Tax haven		
Dummy Tax haven	0	1	Total
0	15,416,060	18,841	15,343,901
	99.88	0.12	100.00
1	12,385	56,796	69,181
	17.90	82.10	100.00
Total	15,428,445	75,637	15,504,082
	99.51	0.49	100.00

Source: FICUS-FARE and LIFI.
Note: Transitions in frequencies and percentages.

Table 12: Treated firms in 2014

Treated	Frequency	Percent	Cum.
0	1 490 032	99.67	99.67
1	4 900	0.33	100

Source: Authors' calculations using LIFI and FICUS-FARE.

Table 13: Event study: tax haven MNEs

	ln var. wages (1)	ln top 1% (2)	ln top 0.5% (3)	ln top 0.1% (4)
1.MNE	0.0635^{a}	0.0405^{a}	0.0503^{a}	0.0659^{a}
	(0.0173)	(0.00796)	(0.00837)	(0.00904)
1.MNE_lwc	0.0265	-0.0151	-0.00191	0.0123
	(0.0533)	(0.0251)	(0.0256)	(0.0271)
skil_sh3	0.764^{a}	0.268^{a}	0.241^{a}	0.222^{a}
	(0.0509)	(0.0182)	(0.0185)	(0.0187)
affil	0.00512^{a}	0.00266^{a}	0.00292^{a}	0.00289^{a}
	(0.00135)	(0.000443)	(0.000496)	(0.000660)
exp_int	0.0785^{b}	0.0615^{a}	0.0634^{a}	0.0720^{a}
	(0.0338)	(0.0152)	(0.0157)	(0.0162)
lead6	0.0129	0.00918	0.0144	0.00255
	(0.0305)	(0.0134)	(0.0143)	(0.0153)
lead5	0.0338	0.0145	0.0189	0.00764
	(0.0266)	(0.0120)	(0.0127)	(0.0137)
lead4	-0.0153	-0.00870	-0.00417	-0.0140
	(0.0250)	(0.0114)	(0.0120)	(0.0130)
lead3	-0.00724	0.00707	0.00676	-0.00735
	(0.0230)	(0.0104)	(0.0110)	(0.0117)
lead2	0.00614	0.0124	0.0125	0.00209
	(0.0229)	(0.0106)	(0.0111)	(0.0117)
lag0	-0.0717^{b}	-0.0306^{b}	-0.0420^{a}	-0.0591^{a}
	(0.0248)	(0.0114)	(0.0120)	(0.0129)
lag1	-0.0828^{b}	-0.0460^{a}	-0.0597^{a}	-0.0726^{a}
	(0.0262)	(0.0122)	(0.0128)	(0.0137)
lag2	-0.0427	-0.0295^{b}	-0.0461^{b}	-0.0444^{b}
	(0.0299)	(0.0136)	(0.0143)	(0.0155)
lag3	-0.0675^{b}	-0.0385^{b}	-0.0554^{a}	-0.0722^{a}
	(0.0308)	(0.0140)	(0.0150)	(0.0158)
lag4	-0.0802^{b}	-0.0370^{b}	-0.0602^{a}	-0.0647^{a}
	(0.0331)	(0.0154)	(0.0161)	(0.0174)
lag5	-0.0626^{c}	-0.0352^{b}	-0.0544^{b}	-0.0460^{b}
	(0.0374)	(0.0169)	(0.0178)	(0.0197)
lag6	-0.0425	-0.0258	-0.0564^{b}	-0.0469^{b}

	(0.0424)	(0.0199)	(0.0204)	(0.0221)
lag7	-0.0284	-0.00969	-0.0360	-0.0338
	(0.0492)	(0.0231)	(0.0239)	(0.0255)
lag8	-0.102^{b}	-0.0371	-0.0701^{b}	-0.0773^{b}
	(0.0497)	(0.0230)	(0.0242)	(0.0255)
lag9	-0.145^{b}	-0.0686^{a}	-0.104^{a}	-0.106^{a}
	(0.0446)	(0.0205)	(0.0214)	(0.0229)
N	48205	48653	48653	48653
adj. R^2	0.793	0.813	0.808	0.802

Standard errors in parentheses
^{c} $p < 0.10$, ^{b} $p < 0.05$, ^{a} $p < 0.001$

Table 14: Event study: Becoming an MNE (exc. tax havens)

	ln var. wages	ln top 1%	ln top 0.5%	ln top 0.1%
	(1)	(2)	(3)	(4)
N	48205	48653	48653	48653
adj. R^2	0.793	0.813	0.808	0.802

Standard errors in parentheses
^{c} $p < 0.10$, ^{b} $p < 0.05$, ^{a} $p < 0.001$

Table 15: Additional tax haven effects

	ln av. wages (1)	ln num. workers (2)
$Tax\ haven_{ft}$	-0.00333	-0.0849^{a}
	(0.00594)	(0.0111)
MNE_{ft}	-0.00402	0.112^{a}
	(0.00536)	(0.0103)
$MNE\ Lwc_{ft}$	0.0239	0.0694^{c}
	(0.0192)	(0.0393)
$Share\ skilled_{ft}$	0.270^{a}	-0.462^{a}
	(0.0163)	(0.0315)
$Num.\ Affiliates_{ft}$	0.00163^{a}	0.0000703
	(0.000325)	(0.000620)
$Export\ intensity_{ft}$	0.0453^{a}	0.0914^{a}
	(0.0127)	(0.0223)
N	48653	48653
adj. R^2	0.755	0.903
Firm FE	Yes	Yes
2-dig. sector X year FE	Yes	Yes
Firm controls	Yes	Yes

Robust standard errors in parentheses
^{c} $p < 0.10$, ^{b} $p < 0.05$, ^{a} $p < 0.001$

References