AGGREGATE LABOR SHARE AND TAX HAVENS: THINGS ARE NOT ALWAYS WHAT THEY SEEM*

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Abstract

Using French firm-level data we study the role of multinational enterprises' (MNEs) presence in tax havens in determining income inequalities between labor and capital by inspecting the dynamics of the aggregate labor share. Given these firms' weight in the economy, we find that tax haven presence of MNEs accounts for a 7.3% of the observed increase in the aggregate share of labor in France between 1997-2014 and argue that this is due to a mismeasurement. We implement a difference-in-differences to analyze the effect of firm entry in tax havens on firms' labor share and on each of its components. We find that the average firm labor share experiences an increase by 2.3% over the immediate years following the establishment in a tax haven. The labor share of MNEs with presence in tax havens is overestimated as tax optimization consists in shifting profits to low tax jurisdictions. Thus underestimating domestic value added, which experiences an average drop by 10.2%. Indeed, the labor share increases even if its numerator, total wage bill, decreases on average by 8.2% when MNEs enter a tax haven. Additionally, the total wage bill drop is explained by a strong decline in employment (-7.7%) rather than a decline on average firm wages, on which there is no statistically significant effect. We argue that the mechanism at play is the "opacity effect" instead of the "tax effect" by showing that the job cuts and tax haven entry nexus is not explained by an increase in capital intensity but rather by a restructuring decision triggering mass layoffs procedures, which French labor law only allows in case of "real and serious economic difficulties". A panel event-study design to shows that our estimates capture the tax haven entry effect and not differential trends between treated and control units. Finally, we show that these developments are exclusively related to tax haven foreign investment and not to other foreign investments.

JEL *classifications*: D33, F23, H26, H87, F66
Keywords: Tax Havens, Labor shares, Profit shifting FDI, Inequalities.

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1 Introduction

The growing discontent with globalization among citizens has crystallized after the Great Recession and has fueled the crisis of multilateralism that we face today. An important factor behind the growing discontent of globalization in developed countries is the perception that it has widened inequalities between the elites, who largely benefit from it, and the rest of the society. Particularly, globalization and more specifically, financial globalization, is perceived as an unfair process where equality of individuals and firms before taxation is trampled given that the wealthiest individuals -and firms- are able to benefit from international tax optimization.

Given that global finance comes with the threat that capital flies away to countries with a more attractive fiscal environment, governments are constrained to carry out public policies that limit this threat. However, the response to this threat has, so far in many cases, resulted in a 'race to the bottom' in terms of taxation and capital regulation, where the fall by more than half in the global average statutory corporate tax rate in the past three decades, may end-up exacerbating inequalities.[1] In this sense, proper measurement of the effects of global finance on inequalities is crucial in the decision making when considering the trade-offs of corporate taxation. Based on the French case, this paper tries to shed more light on the issue. Our findings contribute to advancing in terms of properly measuring the effects of multinational enterprises' (MNEs) usage of tax havens on workers and on how income is distributed between workers and shareholders.

It is well understood that given that capital (here, equity ownership) is highly concentrated, profit-shifting (PS, hereafter) by MNEs exacerbates inequality as this implies that the richest are able to reduce their effective tax rates.[2] Nonetheless, inequalities generated by fiscal optimization by MNEs go beyond the unequal tax burden that these practices generate, as they alter MNEs' labor share, and thus, income inequality between workers and shareholders. In this paper we document two different channels by which MNEs' usage of tax havens alters the share of income that rewards labor. Our contribution is thus twofold, we first bring new evidence

[1] Indeed, [Clausing et al., 2020] document how the global average statutory corporate tax rate between 1985 and 2019 has passed from 49% to 23%.

[2] To be more precise, the tax avoidance and inequality nexus is well understood, although it is poorly quantified so far. See [Tørsløv et al., 2022].

on how MNEs' PS, which we proxy by tax haven presence, overestimates the share of income that accrues to labor. This channel has already been documented by [Guvenen et al., 2022] and [Tørsløv et al., 2022]. More specifically, MNEs can geographically disentangle production, value creation and profits among different affiliates and when they artificially book value added and profits in tax haven affiliates in order to reduce their tax bill, the measured labor share in the production affiliate will artificially look high as it only books the firm's wage bill without booking much income. Furthermore, the strategic organisation of MNEs for tax planning purposes does have aggregate consequences given that these firms usually have an important weight in the economy.[3] Therefore the aggregate labor share is actually lower than currently measured in high tax countries. For instance, our results suggest that 7.3% of the observed rise of the aggregate labor share in France over 1997-2014 is due to MNEs' presence in tax havens. However, as explained later, this is the result of two competing effects of PS on the labor share.

Second and more interestingly, we show that even if the labor share increases due to MNEs' presence in tax havens, the effect on workers goes beyond the overstatement of the share of income that accrues to labor. More specifically, we find that the total wage bill experiences a sharp decline when MNEs first go to a tax haven. This means that despite the fact that the total sums that accrue to workers diminish, we observe an increase in MNEs' labor share when they start to be present in tax havens. The explanation for this is that the drop in the value added that is due to firms' presence in tax havens is even stronger than the drop in the total wage bill, thus the total ratio increases even if its numerator declines.[4] This total wage bill decline is, à priori, in line with the literature. [Krautheim and Schmidt-Eisenlohr, 2016] analyze how PS decreases wage bargaining power of workers. However, what is more surprising, is that the fall in the total wage bill that we find is explained by an almost equivalent decline in the number of workers instead of a fall in the average wages paid by the firm, on which we don't find any statistically significant effect. To the best of our knowledge, this is a channel that has been so far unexplored in the literature. Nonetheless, as we will explain in detail later, this job cuts effect

[3]Indeed, a recent paper by [Martin et al., 2020] explores the contribution of tax avoidance to sales concentration, implying that offshore PS allows firms to become even larger and supporting the idea that tax avoidance is a granular phenomenon.

[4]The labor share is equal to the ratio of the total wage bill of the firm to its value added.

may be specific to countries such as France, due to the strong employment protection legislation, where stringent regulation concerning mass lay-offs, can make the latter expensive and affect MNEs' global capitalisation.[5]

More specifically, using French firm-level data over 1997 and 2014, we implement a standard difference-in-differences (DiD) design with variation in firm entry in tax havens and propose a micro-to-macro mapping using our firm-level regression estimates to calculate the aggregate effect on the labor share. We find that when an MNE goes to a tax haven, its labor share increases on average by 2.3%, which represents 7.3% of the observed increase in the aggregate labor share in France over the sample period. Nonetheless, this is the result of two competing effects on the firm level labor share, one on the numerator and another on the denominator. On the one hand, the firms' value added, the denominator, experiences an average drop by 10.2%, which seems to be partly explained by PS and partly by a real decline in activity. Indeed, the total wage bill decreases on average by 8.2% when MNEs enter a tax haven and this effect is almost essentially by a strong decline in employment, equivalent to -7.7%, rather than a decline on average firm wages, which are not altered by PS. Our results are robust to a placebo test, where tax haven entry is artificially randomly reassigned, to an alternative estimator accounting for the "forbidden comparisons" in two-way fixed effects models and to control variables accounting for alternative explanations for a positive evolution of labor share in MNEs, such as higher rent-sharing and offshoring of low-skilled labor. Finally, given that the tax haven entry is not an exogenous decision we inspect whether the "parallel trends assumption" holds by implementing a panel event-study design, and we restrict our analysis to an almost balanced panel, which significantly alleviates concerns about omitted variable bias, alternative explanations and composition effects. The data rejects the existence of a pre-treatment trend, allowing us to be confident about the identification of the parameter associated to tax haven entry.

These results are, in light of the literature, somewhat puzzling, as one would expect that PS

[5]For instance, [Rilov and Eychenne, 2019], page 19, argue that if Bain Capital, the owner of Samsonite - who unduly avoided paying workers for mass lay-offs- would have disbursed what American groups usually pay out in France when they shutdown an establishment of similar size as the one that Samsonite shut down, its excellent performance in 2006 would not have been possible and would have prevented a rebound of its shares a year later.

would affect wage bargaining power and therefore compress wages, on which we don't find any statistically significant effect.[6] Instead, we find a sharp decline in the number of workers. These results are, however, consistent with claims carried out by trade unionists, whistle-blowers or even lawyers defending former employees of multinationals, whose common ground is that *tax accountability matters and employer accountability matters are intimately linked.* Although, more research is needed in order to formally establish the tax liability connection with employer liability, this nexus has been acknowledged even by PwC, one of the Big Four audit firms, who have been key drivers of tax haven usage by MNEs.[7] In a 2014 report prepared for the European Commission, PwC states that "[...] tax related business confidentiality also weakens corporate accountability to stakeholders of the firm, including workers, long term investors and creditors, as well as the public at large".[8] In the same vein, the Trade Union Advisory Committee to the OECD (TUAC) states that artificial fragmentation of MNEs' domestic activity into different entities allows them to partially or fully avoid the *permanent establishment status*, which in turn, can affect workers by compressing their "remuneration, non-wage benefits, the coverage and quality of the collective bargaining agreement, as well as information and consultation rights.".[9] The latter, being a key ingredient in avoiding disbursing severance packages and other obligations towards workers when MNEs decide to shutdown a healthy subsidiary in France, as recently documented by [Rilov and Eychenne, 2019].[10]. Finally, the decision of entering a tax haven is far from exogenous and can be the result of a group restructuring decision. In this sense, a non-mutually exclusive explanation for a simultaneous drop in employment and tax haven entry can be triggered by a business restructuring decision, following for instance, the advise of an accounting firm in order to increase profitability by offshoring costly labor and reducing tax-related costs.

At the very moment when the regulation of international corporate taxation is being re-thought globally, it is crucial understanding how PS and more broadly the mere existence of tax havens

[6] See for instance [Krautheim and Schmidt-Eisenlohr, 2016] for a theoretical explanation and [Souillard, 2020] for empirical evidence on US MNEs.

[7] See for instance [Jones et al., 2018], who show a strong causal relation between an MNE's use of one of the Big Four and its tax haven network size.

[8] PwC2014 (as cited in TUAC2016assessment).

[9] [Tyrala and Habbard, 2016].

[10] See [Rilov and Eychenne, 2019] for details on how MNEs have avoided their liabilities towards their former employees and the different techniques that they have used.

-which often go hand in hand with lack of financial transparency, affect workers and other stakeholders, aside from shareholders.[11] The remaining of the paper is organized as follows: in the next Section we discuss the related literature in a non-exhaustive manner, in Section 3 we present our data and some descriptive statistics on the evolution of the labor share in France and its relation with MNEs' presence in tax havens. In Section 4 we present our baseline empirical analysis on the firm labor share and on its different components. Section 5 scrutinizes the identification strategy and assesses the dynamics of the tax haven presence effect. Finally, we link our micro-level results with aggregate changes in the labor share in France in Section 7 and Section 8 concludes.

2 Related literature

On aggregate labor share evolution and inequalities. The evolution of the labor share of value added has gained important attention among academia and policy makers in recent years as there has been an increased interest on inequality, its roots and consequences. The labor share measures how income is distributed between capitalists and workers and for a long time macroeconomic models have considered both, the labor and the capital share of value added as constant. One of the famous stylized fact established by [Kaldor, 1957] was that the shares of national income received by labor and capital are roughly constant over long periods of time, with 2/3 for the former and 1/3 for the latter. Keynes himself thought that the stability of this ratio was "miraculous". The downward trend of this share in many of the advanced economies has been highlighted by recent works such as [Karabarbounis and Neiman, 2014], [Piketty and Zucman, 2014] and more recently by [Autor et al., 2020]. Since then a literature around the debate on the decline of the labor share of value added and its causes has largely developed. [Elsby et al., 2013] emphasise the importance of import competition and delocalizations, [Acemoglu and Restrepo, 2018] show that capital-based technological change and automation is an important channel while [Autor et al., 2020] attribute the fall of the labor share to the rise of "superstar firms", whose low labor shares increasingly weight more due to their increasing market shares. While [De Loecker et al., 2020] argue for the increased markups and the rise of market

[11] See the Financial Secrecy Index from the Tax Justice Network for details on the connection between financial transparency and tax havens: `https://fsi.taxjustice.net/en/`.

power exerted by "superstar firms". The fall of the aggregate labor share might also be due to compositional effects due to rising housing returns, as argued by [Gutiérrez and Piton, 2020]. Additionally, this trend is not necessarily observed in every country and period and it may also strongly differ between different firms, as pointed out by [Autor et al., 2020]. In this paper, we examine the contribution of MNEs' PS to tax havens to the evolution of the labor share. In the same way as [Guvenen et al., 2022] and [Tørsløv et al., 2022], we argue that the share of income that rewards labor is overestimated in high tax countries and therefore, inequality between shareholders and workers is understated.

On evidence of PS by MNEs and missmeasurement. The academic literature and statistical offices have extensively documented measurement issues that are related to tax evasion and that affect official statistics, such as GDP (and thus, factor shares), and those relating to the external sector statistics such as the balance of payments (BOP) and the international investment position (IIP).[12] [Lane and Milesi-Ferretti, 2011] document the particular large size of external balance sheets in small, offshore financial centers, while [Lane and Milesi-Ferretti, 2018] document how with the increased complexity of the corporate structure of MNEs and the continuous post-2008 expansion of cross-border FDI positions vis-à-vis financial centers, it is very difficult to disentangle "genuine" financial integration from complex tax evasion schemes. In order to have a clearer understanding of globalization patterns, recent research by [Damgaard et al., 2019] seek to identify which economies host what the IMF coined "phantom investments", which are corporate shells with no real activity in the host economy, and their counterparts. They find that phantom FDI may account for almost 40 percent of global FDI and that by allocating real investment to ultimate investors standard gravity variables explanatory power is significantly increased. [Vicard, 2019] documents how the corporate tax rate correlates with excess returns to international assets, inflating therefore the investment income balance in the BOP. He estimates that PS accounts for the average 2 pp differential between the return to French FDI assets and liabilities and that missing profits in France are equivalent to 1.6% of GDP in 2015. [Tørsløv et al., 2022] document how MNEs are systematically more profitable in

[12]For instance, a well known case is that of Ireland, whose GDP annual growth in 2015 was revised from an expected 7.8% to 26%, following some multinationals' relocation of intellectual property rights to Ireland (exports were revised up by 50 billion euro and the net IIP was revised from expected –150 to –532 billion euro).

low tax jurisdiction countries than in other places, and they are even much more profitable than domestic firms in low tax countries. Exploiting these tax generated anomalies, they estimate that around 36% of global profits in 2015 are shifted to tax havens and revise official statistics adjusted by PS. Their proposed database reports adjusted GDP, trade balance and factor shares, documents how activity is significantly understated in high tax countries. Particularly, their estimates suggest that the European corporate capital share has risen twice as more as recorded in the official national accounts since the early 1990s, an important finding in light of the literature arguing that when real estate excluded, labor shares in Europe may not have declined since the 1970s.[13] [Delatte et al., 2022] analysis on FDI and portfolio securities around the world suggest that 40% of global assets are abnormal; they don't fit gravity estimates, are in tax havens and are concentrated on only six jurisdictions. [Bricongne et al., 2021] evaluate the contribution of the micro level PS to the aggregate productivity slowdown in France over 1997-2015, their results suggest that MNEs presence in tax havens represent an annual loss of 9.7% in terms of the observed aggregate annual labor productivity growth. Finally, [Guvenen et al., 2022] use a *formulary apportionment* technique to evaluate the contribution of US MNEs offshore PS to the measurement of different aggregates from 1982–2016.[14] Their findings suggest that, on average, 38% of income attributed to affiliates abroad is reattributable to the US, which exacerbates the observed decline of US labor share over the period.

On inequalities, rent sharing and PS. To the best of our knowledge, only three additional papers study the effect of PS on wages. On the one hand, [Krautheim and Schmidt-Eisenlohr, 2016] analyze, theoretically, rent-sharing between workers and firms in a context of international tax competition. They argue that as rent-sharing reduces profits, firms have an incentive to shift profits when workers imperfectly observe shifted surplus, reducing workers bargaining power and wages. On the other, [Souillard, 2020] studies how PS affects wage inequality between different workers using US listed MNEs. He finds that PS increases executives' compensation while it compresses compensation for the rest of employees. More recently [Alstadsæter et al., 2022] find a PS premium on wages in the case of Norwegian MNEs; they argue that PS acts like a tax

[13] See [Gutiérrez and Piton, 2020].

[14] More specifically, they apportion the worldwide income of MNEs who are headquartered in the US to locations where they have operations, based on a combination of labor inputs and sales to unaffiliated entities.

cut increasing rent-sharing within firms present in havens and therefore increasing between-firm inequalities.

On tax havens and employment. Finally, the literature on the employment effects of profit shifting, tax havens, and particularly financial secrecy, is even scarcer. A handful of papers study the real effects of profit shifting and find a positive relation between the latter and employment. The intuition behind this relation lies in the idea that lower tax rates reduce the cost of capital, which in turn increases real investments and employment. In this sense, by studying different policies that aim at limiting profit shifting, a negative effect is uncovered for domestic employment by [Suarez-Serrato, 2018] for the US, by [Bilicka et al., 2022] for the UK and by [Buettner et al., 2018] for German subsidiaries in high-tax countries. In the same vein, [Souillard, 2022], by focusing on US MNEs' entry in tax havens, finds a positive relation between tax haven entry and global employment of these MNEs. All these studies emphasize the "tax effect" of tax havens, yet very little is known about the effect of secrecy and opacity in tax havens on employment. The present paper emphasizes this channel.

3 Data and stylized facts

3.1 Sources

Our data main data sources for firms domicilated 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) which we use in order 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' workforce and wage bill 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 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.

Finally, the DADS database (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 determine the share of skilled labor in the firm.

3.2 Data at a glance

3.2.1 Evolution of the French labor share

In the specific case of France, the aggregate labor share declined in the late 90s but then started increasing from the early 2000s. However, the speed of this progression is far from homogeneous across different firms. Figures 1 and 2 depict the evolution of the observed labor share for French firms over 1997-2014 according to their location on the productivity distribution. The increase in labor share is steeper for highly productive firms that typically exhibit lower labor shares in

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 eruo, 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.

level, which is a trend that has also been documented by [Bauer and Boussard, 2020]. Furthermore, despite the clear positive trend among all firms, when we separately depict the evolution of the labor share for domestic firms and for multinational firms in Figures 3 and 4, it can be observed that it is strongly influenced by MNEs. Additionally, it appears that this progression is the strongest for MNEs based in France and with a presence in a tax haven[15]. Interestingly, the labor share trend divergence between MNEs with a presence in a tax haven and the rest of MNEs starts to be observed around 2004-2006, which coincides with the moment where France starts to become a relatively high corporate tax country.

Indeed, during a period of intense tax competition, particularly from its EU partners, around the the mid-2000s France became a high-tax jurisdiction. Figure 25 in the appendix, taken from [Vicard, 2019], shows that despite a relatively stable statutory corporate tax rate over the period between 2000 and 2014, France has gradually transitioned from being around the global average to a high corporate tax country. More specifically, the average tax differential in relation to the

[15]Following the IMF list, which is presented in the Appendix A.

rest of the world has increased from 5 to 16 percentage points, and from 2 to 18 percentage points in relation to other EU countries. While it may be true that the statutory corporate tax rate can be very different from what companies effectively pay (usually much less in the case of tax havens), it serves the purpose of illustrating the generalized downward tax tendency around the world – which accelerated after the crisis, and how France stands in it.[16]

Additionally, unlike the US over the period, France has a territorial tax system for corporations which provides for a participation exemption on dividends distributed by foreign affiliates. The territorial tax system generates a clear rational for multinational companies to shift their profit to low tax jurisdictions, particularly around the mid-2000s, due to a more flexible European regulation with respect to PS. Indeed, [Schenkelberg, 2020] provides evidence suggesting that the 2006 European Court of Justice (ECJ) judgment concerning the Cadbury Schweppes case, facilitated PS within Europe by making European Controlled-Foreign-Company (CFC) rules on tax planning activities within Europe less effective.[17]

Figure 1: LS levels

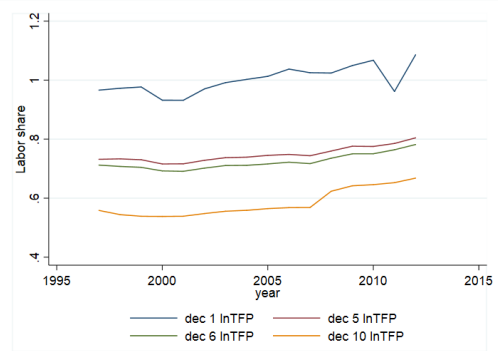
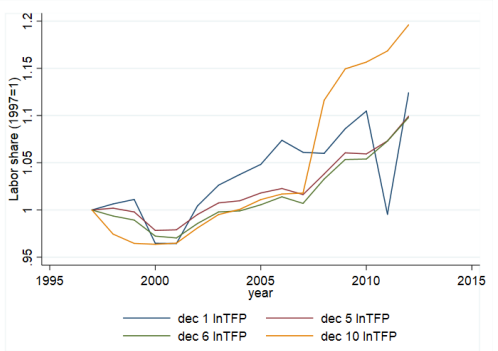


Figure 2: LS evolution



Note: Average labor share by productivity deciles.
Source: Ficus-Fare.

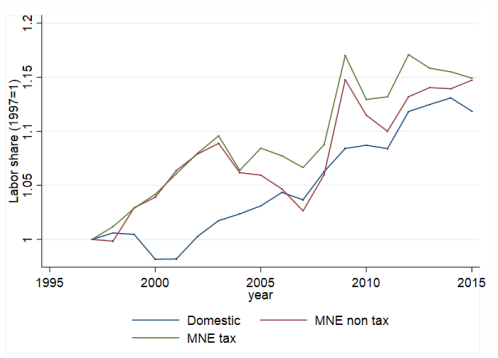
[16]For instance, Luxembourg's statutory corporate tax rate between 2010 and 2020 has on average been 28%, which is one of the highest rates in the world (see KMPG global: `https://home.kpmg/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html`) while the country is on the top 10 of all of tax havens lists - with the exception, of course, of "governmental lists", which are highly political and from which members are excluded (e.g. the EU list of "non-cooperative tax jurisdictions" doesn't list Luxembourg).

[17]See: Judgment of the Court (Grand Chamber) of 12 September 2006. Cadbury Schweppes plc and Cadbury Schweppes Overseas Ltd v Commissioners of Inland Revenue.

Figure 3: LS levels

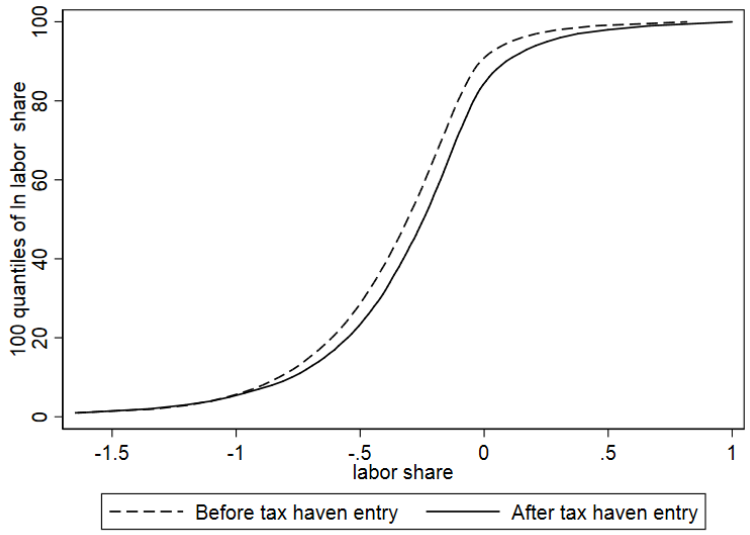


Figure 4: LS evolution



Note: Average labor share by type of firm.
Source: Ficus-Fare.

Figure 5: Labor share distribution and tax haven entry



Beyond averages, one can also analyze changes in the whole distribution of the labor share when firms enter a tax haven. This is done in Figure 5, where the dashed line depicts the cumulative distribution function (CDF) of the labor share of firms before their entry in a tax haven and the solid line depicts the CDF of the labor share after the tax haven entry. The latter, clearly lies at the right of the former, which means that the labor share CDF after firms enter a tax haven stochastically dominates the labor share CDF before firms' tax haven entry. This dominance is

also confirmed by a Kolmogorov-Smirnov test of equality of distributions (see Table 18 in the appendix).

3.2.2 Labor share decompositions

Aggregate evolutions are the result of changes at the micro level, where a pertinent question to ask is whether the are compositional effects. In particular, we would like to know if the increase of the aggregate labor share in France stems mostly from generalized changes in labor shares (i.e., the average firm increases its labor share at constant market shares), from reallocation of market shares towards firms with high labor share firms (at constant levels of labor shares) or from firms entering and exiting the market. In order assess this question, as [Autor et al., 2020], we follow [Melitz and Polanec, 2015] decomposition for productivity, which we apply to aggregate labor share changes.

More specifically, the [Melitz and Polanec, 2015] decomposition is a dynamic version of the [Olley and Pakes, 1996] (OP) static method of decomposing productivity levels, which applied to the labor share changes in levels between two different periods (ΔLS) reads as follows,[18]

$$\Delta LS = \underbrace{\Delta ls_S}_{\text{Within-firm}} + \underbrace{\Delta \operatorname{cov}_S}_{\text{Between-firm}} + \underbrace{S_{E2}\left(LS_{E2} - LS_{S2}\right)}_{\text{Exitors}} + \underbrace{S_{X1}\left(LS_{S1} - LS_{X1}\right)}_{\text{Entrants}}$$

where the change of the aggregate labor share LS of individual firms ls_i in a given sector between year 1 and year 2 (in sub-indices) is decomposed into four terms accounting for the contribution of survivors (subindex S), exitors (X) and entrants (E). The first term is the within-firm

[18] For illustration purposes, the static OP decomposition applied to the labor share reads as follows,

$$LS = \underbrace{\left[\frac{1}{N}\sum_{i}^{N} ls_i\right]}_{\text{within-firm}} + \underbrace{\sum_{i}^{N}\left(s_i - \bar{s}\right)\left(ls_i - \bar{ls}\right)}_{\text{between-firm}}$$

contribution and is the average change of surviving firms in the two periods (S in sub-indices). The second term assesses the between-firm contribution and is the change in the allocation of market shares among survivors; it is measured as the covariance between firm market shares and labor share. The third term is the contribution of entrants (E which by definition are only observed in period 2 and where the reference share of labor is that of surviving firms in period 2). And a fourth term captures the contributions of exitors (X which are only observed in period 1 and whose labor share is compared to that of the surviving firms in period 1).

Table 2: Labor Share Dynamic Olley-Pakes Decomposition

	Δ Aggregate labor share	Within-firm term	Between-firm term	Exitors	Entrants
1997-2006	2.08	5.96	-1.63	-2.61	0.36
2007-2015	6.61	11.49	-3.54	-0.93	-0.41

Note: Authors' calculations using manufacturing firms from Ficus-Fare data bases.

The results from this decomposition are shown in Tables 2-5, where we first look at the total market economy, then we exclude MNEs with a presence in a tax haven and then we analyse sector by sector including and excluding tax haven MNEs. The first message arising from this exercise in Table 2, where we examine the whole market economy and we split our sample before and after the 2008 crisis, is that even if we observe a progression of the aggregate labor share in both periods, the increase is much more important after than before the crisis (around 4.5 percentage points higher than before 2008) and this evolution is mostly explained by within-firm increases in the labor share. Interestingly, this result is different from what [Autor et al., 2020] find for the US economy in the sense that the fall in the labor share is (entirely) driven by a reallocation of market shares towards low labor share firms (i.e. by the between-firm term). Nonetheless, our

results indeed echo [Autor et al., 2020]'s findings in the sense that the between-firm term drives down the aggregate labor share and this is particularly true after the Great Recession. In this sense, the singularity of the French economy is that, even if we observe an increasing reallocation of market shares towards low labor share firms, there has been a generalized positive trend in firm labor shares which largely counterbalances the negative reallocation effect.

Table 3: Labor Share Dynamic Olley-Pakes Decomposition with/without MNE in tax havens

	Δ Aggregate labor share	Within-firm term	Between-firm term	Exitors	Entrants
All firms 1997-2015	6.64	12.06	-1.07	-3.32	-1.04
Excl. tax havens 1997-2015	4.79	12.09	-4.38	-1.67	-1.25

Authors' calculations using manufacturing firms from Ficus-Fare and Lifi data bases.

On top of this, Table 3 shows that excluding tax haven MNE's, which we define as having either an affiliate or a parent in a tax haven country during the year of interest, strongly drives the aggregate labor share downwards and this happens entirely through the reallocation term. This means that when including tax haven MNEs in the analysis, market reallocation towards low labor share firms - [Autor et al., 2020]'s argument - is weaker than when excluding them, given that their labor shares are relatively higher, as documented by our stylized facts. This is all the more interesting when one takes into account that tax haven MNEs represent only a tiny fraction of our sample - around 0.7% of all firms and 1.21% of all firm-year observations.[19] However,

[19]More specifically, tax haven MNEs concerns only 19,096 firms (222,523 observations) out of 2,755,473 firms

these firms are usually responsible for a very important share of the market, which explains why these firms' characteristics strongly influence the between-firm and very little the within-firm term of the decomposition. All in all, the share of value added that rewards labor is more than 2.5 percentage points lower when tax haven MNEs are excluded from the analysis, where we argue that part of this result is explained by a mismeasurement of value added generated in France due to PS. This claim will be formally tested in the following sections. Before that, we briefly analyze how different sectors contribute to the aggregate evolution of the labor share and how they differ when excluding tax haven MNEs from the sample.

Table 4 displays the sector decomposition for the whole sample of firms. A first message arising from this exercise is that the weak contribution of the reallocation term is mainly explained by strong sector composition effects. Indeed, the two sectors for which there is a positive sign for this term, are sectors with a relatively large weight in the overall added value of the market economy. The between-firm term of Electricity, gas, water and waste (D-E) and Information and communications (J) sectors are positive and have, respectively, an average weight of 6% and 8% in the total added value of the market sector during the period. With the exception of these two sectors, the reallocation term is negative and often counterbalances the positive contribution of the within-firm evolution, as pointed out by [Autor et al., 2020].

(18,259,555 observations).

Table 4: Labor share Dynamique Olley-Pakes Decomposition (Δ) 1997-2015

Code	Sector	Δ LS	Within Firms	Between Firms	Exit	Entry
A	Agriculture	-18.32	9.23	-19.12	-9.84	1.41
B	Mining and quarrying	5.11	5.39	-9.42	7.06	2.08
C	Manufacturing	1.92	12.01	-6.99	-2.54	-0.55
D-E	Electricity, gas, water & waste	28.70	17.44	51.53	-5.78	-34.49
F	Construction	-0.15	8.86	-6.63	0.52	-2.91
G	Retail	4.78	14.08	-6.73	-2.77	0.20
H	Transportation & storage	-14.02	11.85	-27.75	3.59	-1.07
I	Accommodation & food serv.	10.25	14.66	-4.37	1.60	-1.64
J	Information & communication	20.48	10.94	12.53	-7.62	4.62
K	Financial & insurance act.	8.43	6.47	-12.91	10.32	4.55
M-N	Professional, scientific, technical, administration serv.	2.39	11.59	-6.44	0.19	-3.55
R	Arts & entertainment	8.24	16.88	-9.95	-15.28	16.59
S	Other services	4.05	8.62	-7.28	0.79	1.92
TOTAL	Market economy	6.64	12.06	-1.07	-3.32	-1.04

Source: FICUS-FARE (INSEE), authors' calculation

A more interesting result arises when we repeat the exercise by excluding tax haven MNEs in Table 5. The between-firm term of D-E and J sectors, which previously seemed to be outliers given their positive sign, are strongly reduced without tax haven MNEs. The same is true across a number of other sectors, which echoes the results in the aggregate market economy (Table 2), where tax haven MNEs push the labor share upwards. The most interesting case among all is sector J, which includes Information and communication activities, where the reallocation term becomes negative when excluding MNEs with a presence in tax havens. This sector includes the social medias and more generally economic activities that are strongly intensive in intangible assets, which given their footloose nature facilitate PS.[20] In this respect, this sector may be an exacerbated example of the potential bias introduced by PS on domestic value added (and labor share) measurement. This may also be part of the explanation for the lower magnitude of the between-firm term in Electricity, gas, water and waste sectors (D-E) and is consistent with the "Panama Papers" scandal in which Engie, the French energy giant MNE and one of the few players in the D-E sector, was involved.[21]

[20] See for instance [Bricongne et al., 2021] for recent evidence for French firms on how intangible assets facilitate PS.

[21] For more details see next url: `https://www.lemonde.fr/paradise-papers/article/2017/11/08/paradise-papers-le-tour-de-passe-passe-d-engie-pour-economiser-des-millions-d-euros-d-impots_5212202_5209585.html`

Table 5: Labor share Dynamique Olley-Pakes Decomposition (Δ) 1997-2015, excl. MNE in tax havens

Code	Sector	Δ Aggregate labor share	Within-firm term	Between-firm term	Exitors	Entrants
A	Agriculture	-19.26	9.29	-16.89	-14.39	2.74
B	Mining and quarrying	3.74	5.81	-13.81	8.73	3.02
C	Manufacturing	1.58	12.02	-7.50	-1.91	-1.03
D-E	Electricity, gas, water & waste	11.22	17.81	43.52	-14.51	-35.60
F	Construction	-0.25	8.86	-6.89	0.55	-2.77
G	Retail	4.77	14.19	-6.16	-2.54	-0.72
H	Transportation & storage	0.19	12.04	-3.82	-2.52	-5.52
I	Accommodation & food serv.	9.83	14.42	-5.13	1.96	-1.43
J	Information & communication	5.67	11.19	-5.78	7.40	-7.14
K	Financial & insurance act.	13.66	6.21	-9.94	10.20	7.19
M-N	Professional, scientific, technical, administration serv.	7.14	11.63	-6.16	0.21	1.47
R	Arts & entertainment	13.03	16.89	-12.95	-9.68	18.77
S	Other services	4.89	8.66	-5.67	1.34	0.57
TOTAL	Market economy	4.79	12.09	-4.38	-1.67	-1.25

Source: Author's calculations using LIFI and FICUS-FARE (INSEE) bases.

In what follows, we implement a standard a DiD in order to formally evaluate the contribution of PS –through tax haven foreign direct investments (FDI)- to the increase of labor share in France at the micro level and macro level.

4 Estimation strategy & baseline results

Using detailed French data on firm foreign presence by destination and on balance-sheet information and presence abroad over 17 years, we begin by estimating a standard two-way fixed effects model in order to test our central hypothesis, that is, that firm presence in a tax haven is associated with higher labor shares if France. We also carry out a sensitivity analysis by including different controls for alternative explanations for a positive relationship between labor share and tax haven entry. Note that in this first exercise we keep all MNEs that at some point throughout the whole sample period enter a tax haven in order to compare firms that are alike.[22] 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 disentangle the tax haven entry effect by assessing its effect on each of the different components of the labor share. Results from this exercise will be used to calculate the aggregate labor share effects of tax haven presence of MNEs, which we report in Section 7. Finally, Section 5 scrutinizes the identification strategy by (i) restricting the DiD estimations to an almost balanced panel, (ii) by inspecting the pre-treatment trends with the help of a panel event-study, (iii) by implementing an alternative estimator accounting for the so-called "forbidden comparisons" in two-way fixed-effects models and (iv) by implementing a placebo test.

4.1 Labor share: Difference-in-differences

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,

[22] As it has been shown in Table 1, MNEs in tax havens and those that are not in tax havens largely differ in terms of size in particular. Nonetheless, for the sake of robustness, we also report the analysis on a sample where we keep all MNEs in the Appendix in Table 19.

$$ln\ Labor\ share_{fst} = \beta_1\ \mathbb{1}[Tax\ haven_{ft}]\ +\ \alpha\ Z_{ft}^{'}\ + \delta_f + \delta_{st} + \epsilon_{ft} \tag{1}$$

where $ln\ Labor\ share_{fst}$ is the log-ratio of the total wage bill and value added, both in nominal terms, 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, 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.[23]

We expect the coefficient of the tax haven dummy, β_1, to be positive and significant, according to the PS hypothesis. Given that our preferred specification includes firm fixed effects, the coefficient of interest captures the differential effect within a given firm, of starting a presence in a tax haven in a given year with respect to the previous years, where she was not a tax haven MNE. We additionally report estimates of pooled regressions where no control variables and no fixed effects are included, where β_1 is interpreted as the differential effect of being a tax haven MNE with respect to the rest of MNEs. In this case, we don't necessarily expect a positive and significant coefficient given that tax haven and non-tax haven MNEs have comparable labor

[23] See [Abadie et al., 2022] for a recent contribution on when and how standard errors be clustered should.

shares (in levels) over the sample period.[24]

Last but not least, we explore alternative mechanisms that could explain a positive relation between labor shares and MNE that invest in tax havens. A higher rent-sharing with workers and a higher degree of offshoring of low-skilled labor may indeed be confounding variables, providing alternative explanations for the positive and significant coefficient of the presence in a tax haven and labor shares.[25] In order to rule out these confounding explanations we include proxies for offshoring of low-skilled which is measured by a dummy accounting for foreign presence in a low-wage country and rent sharing which is measured by the share of skilled workers. We expect that by accounting for these two confounding factors, our variable of interest, tax haven MNE remains positive and statistically significant, if it is the case that tax optimization is relevant in the determination of labor shares.

Baseline results. Estimation results from our baseline specification are presented in Table 6. The first two columns display the results of a pooled regression of firm labor share on the tax haven dummy, where column (1) presents the results where year dummies are included, column (2) includes sector-year fixed effects and column (3) presents the DiD where firm fixed effects are additionally introduced. Columns (4)-(6) present the same regressions as columns (1)-(3), where additional time varying firm level controls are included. Column (6) is our preferred specification, as presented in equation (1).

The main message arising from Table 6 is that, as expected, the coefficient of the tax haven dummy is positive and significant at the highest levels of acceptance across all specifications. Results for the pooled regression with time effects and the tax haven dummy in column (1), where heterogeneity between firms and sectors is not accounted for, indicates that among all the observations of MNEs that become tax haven MNEs at some point in the sample period, labor shares are on average 3.8% higher for those observations when MNEs are present in a tax haven

[24] See descriptive statistics in Table 1.

[25] See for instance [Laffineur and Gazaniol, 2019] for evidence of offshored activities in low-wage countries and its effects on French wages.

Table 6: Tax haven entry and Labor Share

	Dependent variable: ln labor share					
	(1)	(2)	(3)	(4)	(5)	(6)
$Tax\ haven_{ft}$	0.0373^{a}	0.0423^{a}	0.0175^{a}	0.0601^{a}	0.0543^{a}	0.0223^{a}
	(0.00252)	(0.00252)	(0.00256)	(0.00370)	(0.00369)	(0.00379)
MNE_{ft}				-0.0309^{a}	-0.0179^{a}	-0.00831^{b}
				(0.00344)	(0.00348)	(0.00367)
$MNE\ Lwc_{ft}$				0.0561^{a}	0.0457^{a}	0.0108
				(0.0128)	(0.0126)	(0.0135)
$Share\ skilled_{ft}$				0.130^{a}	0.0834^{a}	0.0491^{a}
				(0.00450)	(0.00583)	(0.00829)
$Num.\ Affiliates_{ft}$				-0.000287	-0.000671^{a}	0.000128
				(0.000194)	(0.000193)	(0.000260)
$Export\ intensity_{ft}$				-0.0538^{a}	-0.0562^{a}	-0.0647^{a}
				(0.00432)	(0.00464)	(0.00781)
N	139817	139762	139602	135221	135164	134922
adj. R^2	0.013	0.072	0.549	0.021	0.077	0.555
Firm FE	No	No	Yes	No	No	Yes
2-dig. sector X year FE	No	Yes	Yes	No	Yes	Yes
Year dummies	Yes	No	No	Yes	No	No

Robust standard errors in parentheses

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

than those when they are not.[26] Only accounting for sector-year heterogeneity in column (2) results in a coefficient which is significant at the 99% confidence level and with a slightly higher magnitude, at around 4.3%. Nonetheless, these first regressions do not capture for the effect of entering a tax haven. Column (3), which additionally exploits the within-firm dimension of the panel with the firm fixed effects, suggests that when a firm becomes a tax haven MNE, its labor share increases on average by 1.8%, relative to the years before she was not present in a tax haven.

How robust is this effect robust to alternative explanations which may confound with tax haven presence and higher labor shares, such as rent sharing and offshoring of low-skilled jobs? Estimation results in the last three columns show that the effect is indeed robust as the tax haven dummy coefficient remains statistically significant at the 99% confidence level across the three specifications, with coefficients that are stronger in magnitude than without control variables. Again, exploiting the within-firm variation with the firm fixed-effects reduces the coefficient. Column (6) displays our preferred specification, where firm unobserved time invariant heterogeneity is controlled for and where results are purged out from all shocks that are sector specific, in this case becoming an MNE with presence in a low-wage country does not have any statistically significant effect on labor share, while the share of skilled workers is significant at the highest levels of acceptance. Columns (4) and (5), which only exploit the between-firm dimension of the panel, show a positive and statistically significant coefficient of the dummy capturing the (between-firm) presence in a low-wage country. This suggests that the low-skilled labor offshoring strategy is indeed strongly related with higher labor shares in France, and this result is robust to changes in the share of skilled labor. Thus, one can conclude that the two variables capture different phenomena. In this sense, conditional on controlling for offshoring of low-skilled labor, it seems reasonable to interpret the coefficient of the share of skilled labor as a proxy for rent sharing. Indeed, the coefficient of the share of skilled labor can capture two different developments: (i) the fact that more skilled workers have a stronger bargaining power and hence the variable can reflect the firm's rent-sharing; or alternatively, (ii) the variable may just reflect the fact that, at constant rent-sharing, skilled workers have higher wages than low-skilled workers. The coefficient

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

of the share of skilled labor appears to be invariably positive and significant at the highest levels across all specifications.

These results suggest that tax haven presence has an independent, positive and significant effect of around 2.3% on the firm's labor share. Indeed, the tax haven entry coefficient passes from 1.8% in column (3) to 2.3% in column (6), which means that the effect is even strengthened with the inclusion of control variables accounting for alternative explanations for a positive relation between tax haven entry and firm labor share. All in all, the positive and significant relation between becoming a tax haven MNE and displaying a higher labor share is robust to a higher degree of offshoreability of low-wages, to increases in the share of skilled workers and most importantly, 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.

4.2 Labor share components: Difference-in-differences

In the previous subsection we tested the central hypothesis of this paper, that is that when firms book their value added in a tax haven in order to lower their tax bill, the share of income that rewards labor is overstated in the high tax country as the denominator of the labor share is underestimated. Indeed, we found evidence compatible with this hypothesis, as on average, the labor share of income immediately increases by around 2.3% when firms enter a tax haven. Nonetheless, one can also wonder whether the labor share of income changes due to the effect on its numerator. In other words, is the effect of tax haven presence on labor share only explained by changes in its denominator (shifted value added abroad) or does it also have an effect on the total wage bill of firms? One could argue that when firms are present in tax havens their tax bill decreases, hence their total costs also do. Which in turn may give firms more flexibility to increase their rent sharing with workers to attract the best ones. This hypothesis is consistent with [Alstadsæter et al., 2022] who find a positive relation between presence in tax havens and firm wages. On the contrary, one could also argue that when firms book their profits in tax havens, workers in high tax countries have a lower value on which they can bargain their wages

and contract conditions, pushing the total wage bill downwards, consistent with [Krautheim and Schmidt-Eisenlohr, 2016].

Thus, in this subsection we analyze the effect of tax haven presence on the different components of the firm labor share, which is the ratio of the total wage bill to the value added of the firm. Additionally, the effect on the numerator, the total wage bill, can be additionally decomposed into two different terms, the firm average wages on the one hand, and the total number of workers on the other. More precisely, the firm labor share is composed by the different following terms,

$$Labor\ share = \frac{Total\ wage\ bill}{Value\ added} = \frac{Average\ wages\ \times\ Number\ of\ workers}{Value\ added}$$

We therefore re-estimate a DiD as in equation (1) on the labor share and on each of the different components of the firm labor share as follows,

$$ln\, Y_{fst} = \beta_1\, \mathbb{1}[Tax\ haven_{ft}] + \alpha\, Z_{ft}^{'}\, \delta_f + \delta_{st} + \epsilon_{ft} \tag{2}$$

Where $ln\, Y_{fst}$ alternatively represents the firm labor share, its value added, the total wage bill, the firm average wages and the total number of workers. Results from these estimations are displayed in Table 7. Column (1) is equivalent to column (6) in the baseline results, where we find an average 2.3% increase in the average firm labor share. Column (2) shows the results for the effect on value added, which is unsurprisingly very much in line with the PS hypothesis. The results suggest that on average, value added decreases by 10.2% with respect to the years prior to the tax haven presence. Much more interestingly, column (3) displays the results for the numerator of the labor share, the total wage bill, which on average decreases by 8.2% when firms begin to be present in a tax haven. Therefore, despite a strong decrease in the numerator, the effect of tax haven presence on the labor share remains positive due to an even stronger decrease in its denominator, the value added.

A natural question that arises is whether this negative effect on total wage bill is explained by a decrease in the average wages of the firm or rather by a reduction in the number of workers in the firm, or both. Results in columns (4) and (5) suggest that the decline in total wage bill

Table 7: Tax haven entry and Labor Share components

	Dependent variable				
	ln labor share	ln VA	ln wage bill	ln av. wages	ln num. workers
	(1)	(2)	(3)	(4)	(5)
$Tax\ haven_{ft}$	0.0223^{a}	-0.108^{a}	-0.0859^{a}	-0.00549	-0.0804^{a}
	(0.00379)	(0.00697)	(0.00606)	(0.00390)	(0.00684)
MNE_{ft}	-0.00831^{b}	0.128^{a}	0.120^{a}	0.00273	0.117^{a}
	(0.00367)	(0.00673)	(0.00586)	(0.00375)	(0.00663)
$MNE\ Lwc_{ft}$	0.0108	0.0257	0.0365	0.0370^{b}	-0.000541
	(0.0135)	(0.0279)	(0.0247)	(0.0149)	(0.0270)
$Share\ skilled_{ft}$	0.0491^{a}	-0.194^{a}	-0.145^{a}	0.228^{a}	-0.373^{a}
	(0.00829)	(0.0179)	(0.0170)	(0.0107)	(0.0186)
$Num.\ Affiliates_{ft}$	0.000128	0.00268^{a}	0.00281^{a}	0.00153^{a}	0.00128^{b}
	(0.000260)	(0.000539)	(0.000430)	(0.000279)	(0.000436)
$Export\ intensity_{ft}$	-0.0647^{a}	0.218^{a}	0.154^{a}	0.0452^{a}	0.108^{a}
	(0.00781)	(0.0157)	(0.0138)	(0.00891)	(0.0146)
N	134922	134922	134922	134922	134922
adj. R^2	0.555	0.907	0.924	0.735	0.909
Firm FE	Yes	Yes	Yes	Yes	Yes
2-dig. sector X year FE	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

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

after a presence in a tax haven, is explained by a sharp job cut with no statistically significant effect on the average wages (despite a negative sign). Our results imply that as soon as a firm enters a tax haven, its number of workers is on average reduced by around 7.7% relative to the years prior to the tax haven presence. From a back of the envelope calculation, this means that the labor share increases despite an average decrease by 29 jobs at level of the firm, when MNEs' go to tax havens.[27] This suggests, that the 10.2% drop on value added due to tax haven presence is not only explained by a tax motivated PS, and therefore, not only due to mismeasurement of value creation in France, but that it also partly involves a real negative effect.

What could explain a negative effect on real activity when firms start to invest in tax havens? A plausible explanation for these results can be linked with a strong employment protection in France, which increases labor costs and the incentives to use tax havens to avoid costly labor protection legislation. This is in line with claims made by trade unionists who argue that *employer liability is intimately intertwined with tax liability.* More specifically, our results are consistent with what is commonly known as "social fraud", that is, that firms avoid paying workers' compensation in case of mass lay-offs. Indeed, the French law stipulates that a company in good economic conditions who decides to relocate its activity to a low-wage country or who simply wishes to close its activity in France, thus generating mass lay-offs, is required to compensate its workers.[28] This compensation can, nonetheless, be financed by the community and thus, avoided, if the firm is not in a good economic shape.[29] One way of demonstrating a bad economic shape can be done with the help of an affiliate that books the firm's profits. Theoretically, this affiliate does not necessarily need to be domiciled in a tax haven, nor in a foreign country. However, opening this affiliate in a tax haven may have at least two advantages. First, the obvious one, which is a reduction on the tax bill and a second one, which is related to the lack of transparency that these countries usually offer, exposing themselves less to any

[27] 29 jobs represents 7.7% of 371, which is the average number of employees in MNEs that are present in tax havens from Table 1.

[28] This is what is called the Plan de Sauvegarde de l'Emploi (PSE) which is an employment safeguard plan concerning firms above 50 employees who fire more than 10 employees in France. For more detail see: `https://www.service-public.fr/particuliers/vosdroits/F2811?lang=en`

[29] More precisely, this is what is called the "Assurance garantie des salaires" (AGS) a salaries insurance which guarantees the payment of sums due to employees (salaries, notice periods, severance payments, etc.) in the event of insolvency, compulsory liquidation or employment safeguard measures.

lawsuit filed by its former employees. In other words, tax haven affiliates provide MNEs a way to avoid paying their employment liabilities, such as payment of severance packages and social obligations towards their former employees, by transferring these to taxpayers.

Although more research is needed in order to formally establish the social fraud and tax haven nexus and its effects on taxpayers, income inequalities between workers and shareholders may end up being strongly exacerbated by this link. Some anecdotal evidence of this type of fraud to the social security and its link with tax havens include testimonies by whistle-blowers, trade unions and lawyers defending workers against these practices done by MNEs. For instance a recent book by [Renahy, 2019], a former employee at a law firm in Jersey, denounces how, beyond tax evasion, the firm for which he worked during the 2000s helped companies to artificially underestimate their profits or hide funds in different tax havens in order to finance mass lay-offs in France. In the same vein, [Rilov and Eychenne, 2019], the latter being a professional lawyer who has defended several groups of employees who have been laid-off without the due severance payments, documents some highly mediatized cases, where firms avoided paying severance packages and transferred the related costs to tax payers by using complex corporate structures. These cases include for instance Goodyear, Conti, Faurecia, Continental, Samsonite, 3 Suisses, UPS, Flodor and Coca-Cola. Again and importantly, these social frauds do not necessarily involve affiliates in tax havens, but they certainly serve the propose of hiding profits and avoiding paying the due redundancy packages, which can be expensive for big and profitable firms. Rilov argues that in the case of Samsonite's lay-offs in 2007, without the firm's affiliates multiplication technique to avoid paying employees' due compensation, which in the end had to be payed with taxpayers' resources, these lay-offs would have costed Samsonite tens of million USD.

Similarly, the Trade Union Advisory Committee to the OECD argues that MNEs shift capital to tax havens deterring it from productive investment and job creation in the home country, undermining employment. Particularly, they claim that aggressive tax planning is instrumented as way of corporate "regulatory planning" or regulatory arbitrage allowing MNEs to escape not only its tax duties but also its obligations to other stakeholders, including workers. In this sense, they argue that:

[...] tax liability issues are intertwined with employer responsibility issues. A trade unionist of the French subsidiary of Colgate perfectly captured why tax planning matters for trade union action: "the farther you are from where tax is being declared within the MNE group structure, the higher the risk for worker misery".[30]

The reasoning behind this statement is that tax-motivated restructuring results in fragmentation of the firm into multiple entities and in decision making centers that are transferred outside of the legal perimeter of the local firm. This allows to artificially reduce local profits and significantly reduce workers' access to information on the real financial health of the firm. The TUAC argues that this, in turn motivates, cuts in investment in local productive capacities, cuts in employment and even allows firms to display a reduced ability to face their liabilities.[31]

Likewise, a non-mutually exclusive explanation for a negative relation between local employment and tax haven entry can be a business restructuring decision, following, for instance, an accounting firm's consultancy with the aim of increasing overall profitability. In this sense, a group restructuring decision can simultaneously result in offshoring of jobs to lower wage countries in order to reduce labor costs -a variable which is included in the set of controls in our regressions- and a presence in tax havens in order to reduce tax related costs. Finally, an alternative explanation has to do with the "tax effect" of profit shifting which makes the cost of capital less expensive and which could translate into a substitution of labor in favor of capital. Section 6 excludes this explanation and provides additional evidence pointing to the direction of the "opacity effect" of tax havens by showing that tax haven entry is systematically related to mass layoffs procedures. The latter are only allowed by law in cases of "real and serious" economic difficulties - which can be invoked by showing a decline in total sales that lasts for 3 to 4 quarters for firms with more than 50 employees, as is usually the case for these firms.

All in all, our results suggest that in order to assess the labor share effect of MNEs' presence in

[30] See the TUAC Secretariat assessment of The G20/OECD Base Erosion and Profit Shifting Package [Tyrala and Habbard, 2016], page 18.
[31] See TUAC2016assessment.

tax havens, in a high tax country with a strong employment protection legislation such as France, one has to account not only for the mismeasurement of the labor share due to PS, but one also has to account for its real effects in terms of employment losses, whose severance payments may be transferred to tax payers.

5 Identification scrutiny and dynamic effects

5.1 DiD on balanced panel

As mentioned earlier, given that we cover 17 years and that firms can enter tax havens at different years of the panel, the tax haven entry treatment may also capture the changing composition of the sample. Therefore, this section keeps only those firms that are observed at least 15 years over the sample, in order to get an almost balanced panel. We re-estimate a DiD as in equation (2) on the labor share and on each of the different components of the firm labor share on this balanced subsample. Results from these estimations are displayed in Table 8.

Under the restricted sample, our results confirm those obtained in the baseline estimations but with slightly stronger effects. The average firm labor share experiences an increase by 2.6% over the immediate years following the establishment in a tax haven. Whereas the average effect on the value added is equivalent to 10.8%, to 8.4% on total wage bill and to 8.1% on the number of workers. Therefore, these results confirm that despite a strong decrease in the numerator, the effect of tax haven presence on the labor share remains positive due to an even stronger decrease in its denominator, the value added. And again, the decline in the total wage bill is the result of a sharp decline in the number of workers instead of a decline on average wages, on which we don't find any statistically significant effect.

Despite our stringent estimations where with the set of fixed effects, only explanatory variables that simultaneously vary by firm and year can be identified and where all time variation that is sector specific is purged out, it is difficult to argue that our treatment variable is exogenous

Table 8: Labor share components: treated firms and balanced panel

	Dependent variable				
	ln labor share	ln VA	ln wage bill	ln av. wages	ln num. workers
	(1)	(2)	(3)	(4)	(5)
$Tax\ haven_{ft}$	0.0257^{a}	-0.114^{a}	-0.0882^{a}	-0.00333	-0.0849^{a}
	(0.00603)	(0.0112)	(0.00974)	(0.00594)	(0.0111)
MNE_{ft}	-0.0111^{b}	0.119^{a}	0.108^{a}	-0.00402	0.112^{a}
	(0.00545)	(0.0103)	(0.00901)	(0.00536)	(0.0103)
$MNE\ Lwc_{ft}$	0.00476	0.0886^{b}	0.0933^{b}	0.0239	0.0694^{c}
	(0.0173)	(0.0374)	(0.0349)	(0.0192)	(0.0393)
$Share\ skilled_{ft}$	0.0193	-0.212^{a}	-0.192^{a}	0.270^{a}	-0.462^{a}
	(0.0129)	(0.0286)	(0.0271)	(0.0163)	(0.0315)
$Num.\ Affiliates_{ft}$	-0.000212	0.00191^{b}	0.00170^{b}	0.00163^{a}	0.0000703
	(0.000321)	(0.000629)	(0.000565)	(0.000325)	(0.000620)
$Export\ intensity_{ft}$	-0.0712^{a}	0.208^{a}	0.137^{a}	0.0453^{a}	0.0914^{a}
	(0.0111)	(0.0230)	(0.0200)	(0.0127)	(0.0223)
N	51670	51670	51670	51670	51670
adj. R^2	0.555	0.906	0.924	0.755	0.903
Firm FE	Yes	Yes	Yes	Yes	Yes
2-dig. sector X year FE	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

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

and thus, that it is independent from our outcome of interest. However, assessing the existence of a conditional common trend allows testing whether the dependence between our treatment assignment and the treatment-specific outcome has been removed or at least strongly reduced by conditioning on observable variables and fixed effects. To test this, we rely on an event-study design in what follows.

5.2 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,

$$\begin{aligned} ln\, Y_{fst} = & \sum_{j=2}^{J} \sigma_j \, \mathbb{1}[Lag\ j]_{ft} + \sum_{k=1}^{K} \eta_t \, \mathbb{1}[Lead\ k]_{ft} \\ & + \alpha \, Z_{ft}^{'} + \, \delta_f + \delta_{st} + \epsilon_{ft} \end{aligned} \tag{3}$$

where $ln\, Y_{fst}$ alternatively represents the firm labor share, its value added, the total wage bill, the firm average wages and the total number of workers. 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,

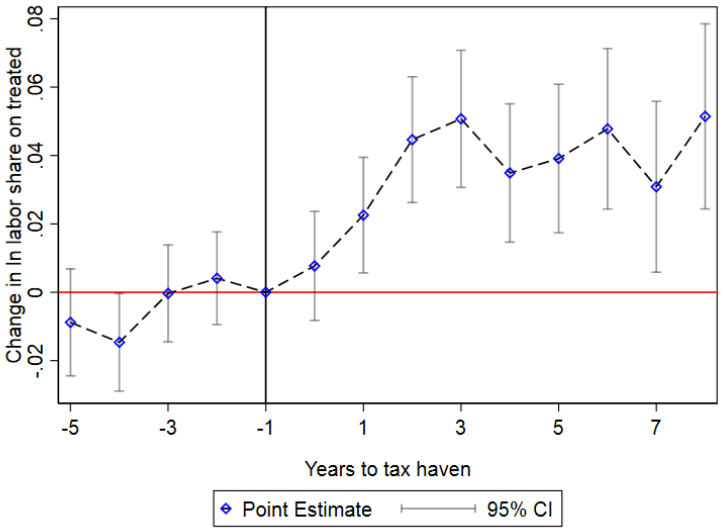
$$
\begin{aligned}
(Lag\ J)_{st} &= \mathbb{1}[\, t \leq Event_f - J] \\
(Lag\ j)_{st} &= \mathbb{1}[\, t = Event_f - j]\ for\ j \in \{1, ..., J-1\} \\
(Lead\ k)_{st} &= \mathbb{1}[\, t = Event_f + k]\ for\ k \in \{1, ..., K-1\} \\
(Lag\ K)_{st} &= \mathbb{1}[\, t \geq Event_f + K]
\end{aligned}
$$

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 3, 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 20 in the Appendix and are plotted in Figures 6-10 for each of the outcome of interest, Y_{fst}.

The first message arising from Table 20 and Figures 6-10 is that the results from the static version of the DiD in Table 8 are reliable, as the dynamic version confirms the conclusions for each Y_{fst}. As before, except for the average wages of the firm, the treatment has a statistically significant at the highest levels of acceptance. Additionally, the absence of any clear pre-treatment trend for the labor share, the value added, the total wage bill and the number of workers, make us confident about the fact that our treatment captures the productivity effect of entering a tax haven and not any other confounding effect. On top of this, our results suggests that the tax haven entry on each of these variables of interest has strong dynamic effects, which remain statistically significant at the 99% confidence level 9 years after the event.

It is clear from these figures that the effect on the labor share has two opposing forces where the one on its denominator, the value added, jeopardizes the one on its numerator, the total wage

Figure 6: Labor share



bill. More precisely, from column (1) one can conclude that on average, after 9 years of tax haven presence, the firm's labor share increases by 6.6% (with respect to year prior to the event). This increase after 9 years is the result of a sharp decline in the total wage bill (column (3)) and an even stronger decline in the firm value added (column (2)), equivalent to -17.9% and -24.4%, respectively. As before, the drop in the total wage bill is entirely explained by a decrease in the number of workers (column (5)), which tantamount to -17.7%. While there is no significant effect on the average wages of the firm (column (4)). Using the average number of employees in MNEs that are present in tax havens from Table 1, a back of the envelope calculation of the cost in terms of jobs due MNEs presence in tax havens, tantamount to an average of 66 jobs at the level of the firm after 9 years (or more) of tax haven presence.[32]

[32]Where 66 workers represents 17.7% of 371, which is the average number of workers in MNEs that are present in tax havens as reported in Table 1.

Figure 7: Value added

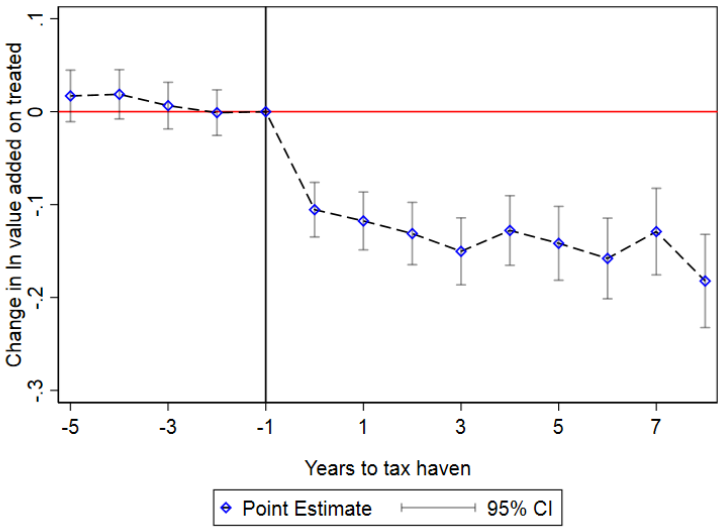


Figure 8: Wage bill

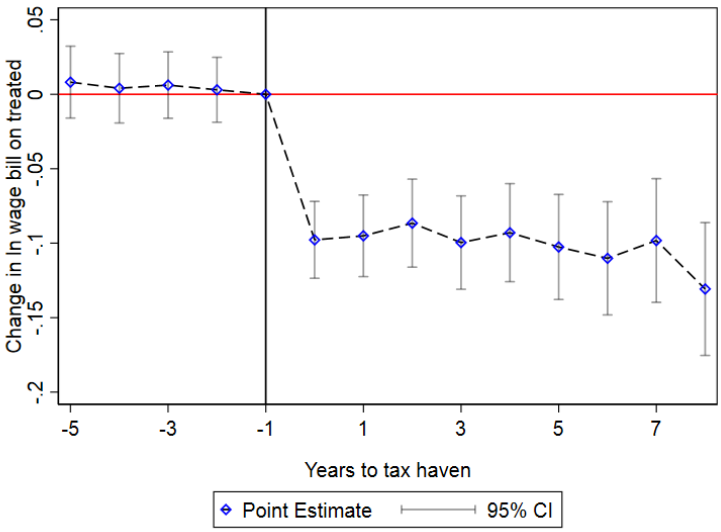


Figure 9: Average wages

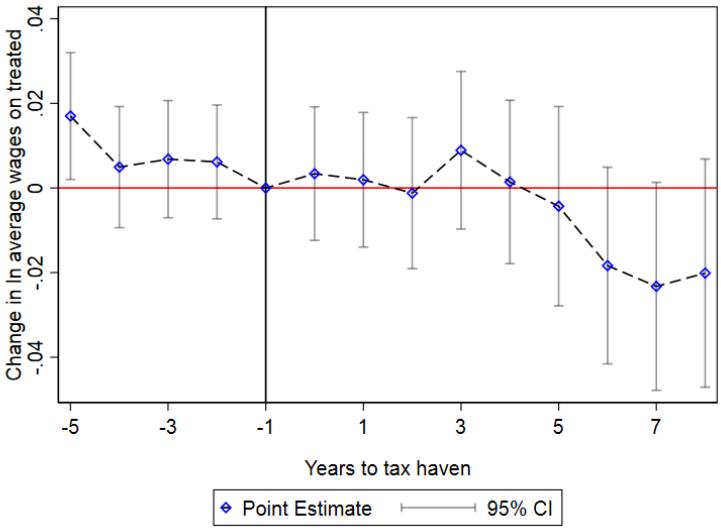
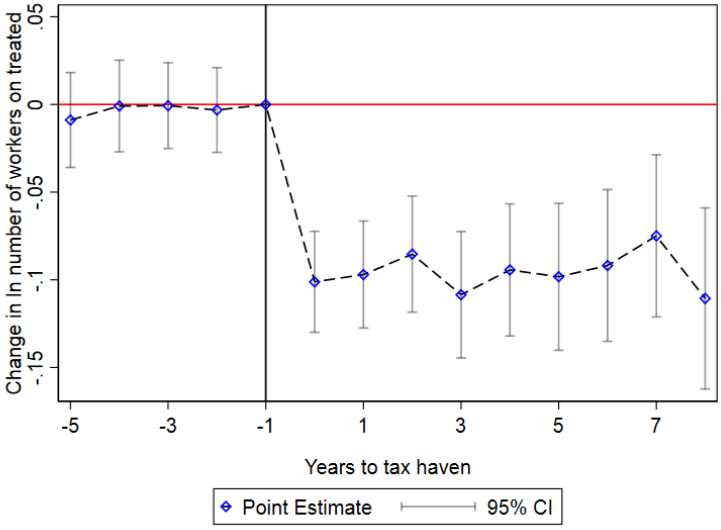


Figure 10: Number of workers



5.3 Robustness: alternative estimator and placebo test

Alternative estimator: Callaway and Sant'Anna (2021). Recent advances in the econometrics of DiD have shown that standard two-way fixed effects model regressions perform both "clean comparisons" between treated and not-yet treated units as well as "forbidden comparisons" between units who are both already-treated, which can lead to biased estimates. [Callaway and Sant'Anna, 2021] develop a new estimator for DiD accounting for biases arising with heterogeneous treatment effects and differences in treatment timing with two-way fixed effects. We therefore repeat the benchmark regressions on the labor share and each of its components using this alternative estimator. The regressions results for the static and the dynamic effects using Callaway and Sant'Anna's estimator (CS hereafter) are displayed in Table 9 and depicted in Figures 11-15, respectively.

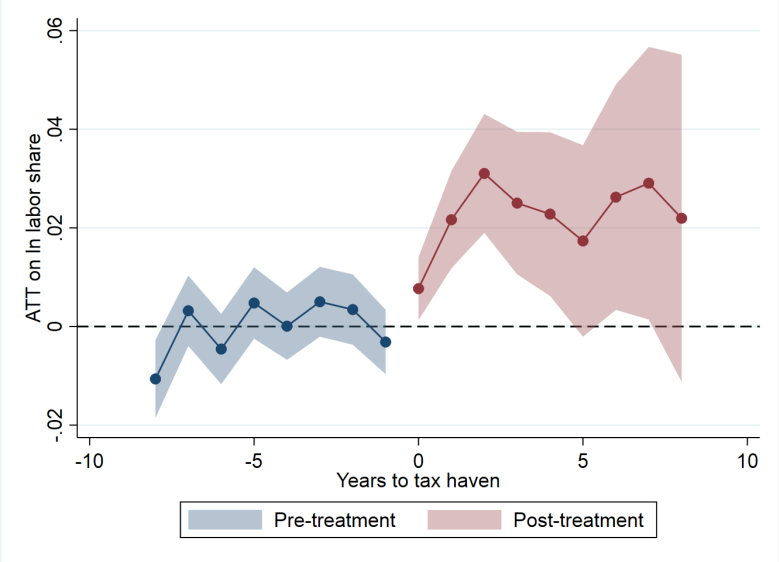
The main message arising from this exercise is that the labor share estimation results are robust, both in therms of sign, magnitude and precision, to the CS estimator (column 1) in Table 9. Concerning each of the labor share components (column 2-5), we find the same signs and that the statistical significance remains the highest, at the 1 percent level, for value added, wage bill and workers. While the coefficient of average wages remains insignificant, as before. Nonetheless, the magnitudes for each of the coefficients is slightly reduced with respect to the two-way fixed effects model. Finally, the CS estimator's coefficients for the dynamic effects of tax haven entry for the labor share and each of its components echo those with the two-way fixed effects model. Figures 11-15 show the same post tax haven entry conclusions as before. And importantly, we again find that there is no pre-trend before the tax haven entry decision for the firm labor share, its value added, its wage bill and its number of workers.

Table 9: Alternative estimator: [Callaway and Sant'Anna, 2021]

	Dependent variable				
	ln labor share	ln VA	ln wage bill	ln av. wages	ln num. workers
	(1)	(2)	(3)	(4)	(5)
ATT	0.0210^{a}	-0.0616^{a}	-0.0406^{a}	-0.00428	-0.0363^{a}
	(0.00433)	(0.00797)	(0.00710)	(0.00436)	(0.00768)

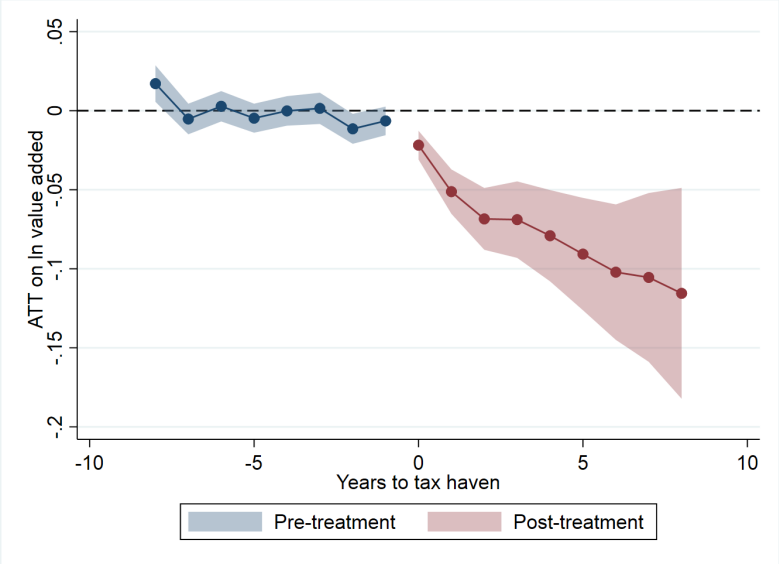
ATT is the simple weighted-average of all average treatment effects across groups and periods.
DiD regressions with two-way fixed effects based on Callaway and Sant'Anna (2021).
Standard errors in parentheses. ^{c} $p < 0.10$, ^{b} $p < 0.05$, ^{a} $p < 0.001$

Figure 11: Labor share



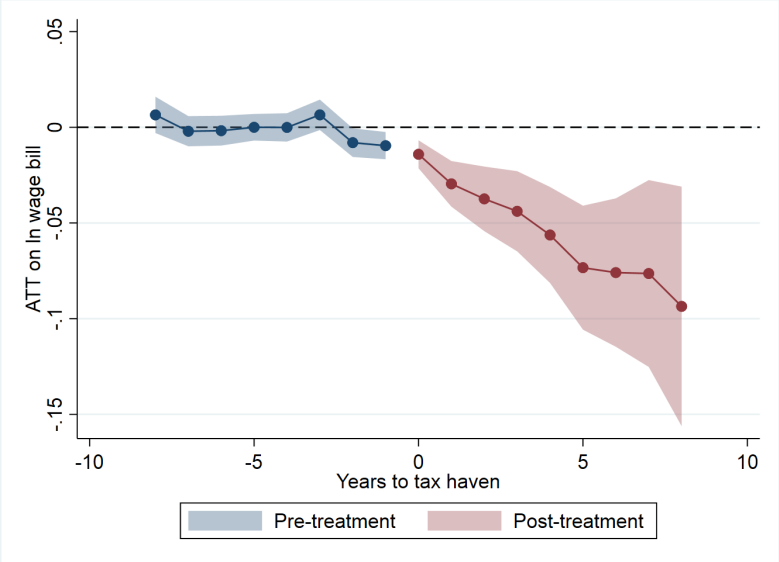
ATT is the average treatment effect. 95% CI.
[Callaway and Sant'Anna, 2021] estimator.

Figure 12: Value added



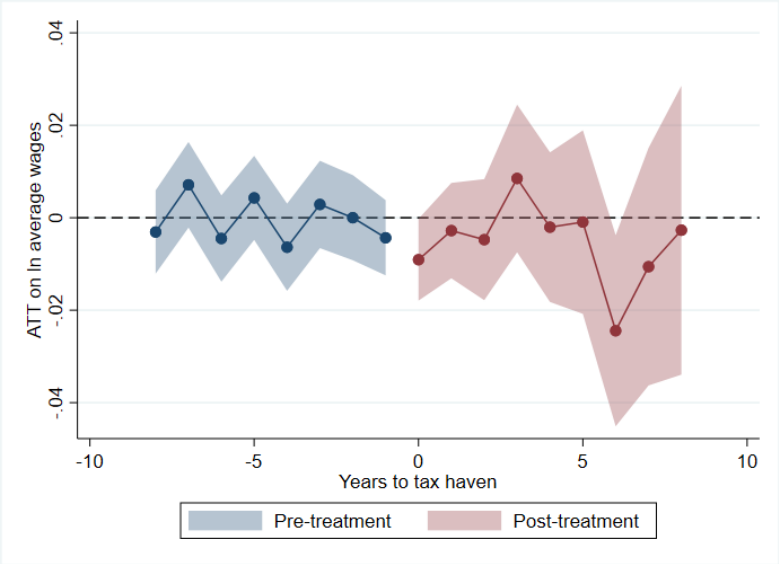
ATT is the average treatment effect. 95% CI.
[Callaway and Sant'Anna, 2021] estimator.

Figure 13: Wage bill



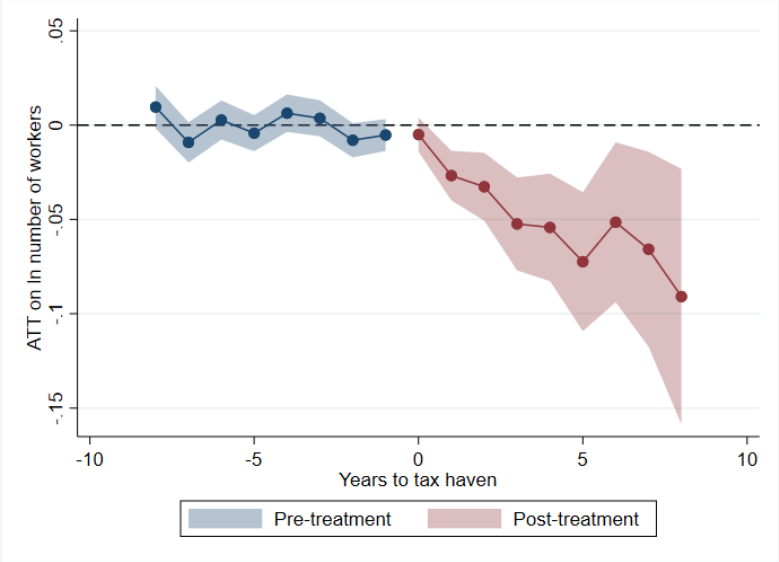
ATT is the average treatment effect. 95% CI.
[Callaway and Sant'Anna, 2021] estimator.

Figure 14: Average wages



ATT is the average treatment effect. 95% CI.
[Callaway and Sant'Anna, 2021] estimator.

Figure 15: Number of workers



ATT is the average treatment effect. 95% CI.
[Callaway and Sant'Anna, 2021] estimator.

Placebo Test. An extremely simple but equivalently helpful supplementary check consists in re-estimating equation 2 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' PS. The results from this test are displayed in Tables 10-12, for each of the different exercises carried out in the previous section and sub-section. In this sense, Table 10 displays the placebo test for the benchmark results for the labor share in Table 6; Table 11 for each of the labor share components in Table 7; and Table 12 for each of the labor share components with a balanced panel as in Table 8.

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 in any of the different specifications or samples. This suggests, therefore, that the entry in a tax haven does capture MNEs' PS and that it increases firms' domestic labor share (in France).

Table 10: Placebo Tax haven entry and Labor Share

	Dependent variable: ln labor share					
	(1)	(2)	(3)	(4)	(5)	(6)
$Tax\ haven\ Placebo_{ft}$	-0.0015	-0.0017	-0.0006	-0.0006	-0.0011	-0.0001
	(0.0022)	(0.0022)	(0.0016)	(0.0022)	(0.0011)	(0.0016)
MNE_{ft}				0.0103^{a}	0.0176^{a}	0.00735^{a}
				(0.00251)	(0.00247)	(0.00179)
$MNE\ Lwc_{ft}$				0.0270^{c}	0.0243	0.0115
				(0.0163)	(0.0153)	(0.0112)
$Share\ skilled_{ft}$				0.128^{a}	0.0904^{a}	0.0569^{a}
				(0.00506)	(0.00603)	(0.00599)
$Num.\ Affiliates_{ft}$				-0.000671^{c}	-0.000997^{b}	-0.000111
				(0.000391)	(0.000417)	(0.000325)
$Export\ intensity_{ft}$				-0.0374^{a}	-0.0374^{a}	-0.0679^{a}
				(0.00536)	(0.00551)	(0.00555)
N	139817	139762	139602	135221	135164	134922
adj. R^2	0.010	0.052	0.521	0.034	0.069	0.538
Firm FE	No	No	Yes	No	No	Yes
2-dig. sector X year FE	No	Yes	Yes	No	Yes	Yes
Year dummies	Yes	No	No	Yes	No	No

Robust standard errors in parentheses

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

Table 11: Placebo Tax haven entry and Labor Share components

	Dependent variable				
	ln labor share	ln VA	ln wage bill	ln av. wages	ln num. workers
	(1)	(2)	(3)	(4)	(5)
$Tax\ haven\ Placebo_{ft}$	0.00239	0.000935	0.00332	-0.000227	0.00355
	(0.00166)	(0.00302)	(0.00267)	(0.00174)	(0.00290)
MNE_{ft}	0.00745^{b}	0.0518^{a}	0.0593^{a}	-0.00116	0.0604^{a}
	(0.00250)	(0.00458)	(0.00403)	(0.00265)	(0.00438)
$MNE\ Lwc_{ft}$	0.00711	0.0435	0.0506^{b}	0.0379^{b}	0.0127
	(0.0135)	(0.0280)	(0.0248)	(0.0148)	(0.0272)
$Share\ skilled_{ft}$	0.0493^{a}	-0.195^{a}	-0.146^{a}	0.228^{a}	-0.374^{a}
	(0.00830)	(0.0179)	(0.0170)	(0.0107)	(0.0186)
$Num.\ Affiliates_{ft}$	0.000165	0.00250^{a}	0.00266^{a}	0.00152^{a}	0.00114^{b}
	(0.000259)	(0.000539)	(0.000430)	(0.000278)	(0.000437)
$Export\ intensity_{ft}$	-0.0646^{a}	0.218^{a}	0.153^{a}	0.0452^{a}	0.108^{a}
	(0.00782)	(0.0157)	(0.0138)	(0.00891)	(0.0147)
N	134922	134922	134922	134922	134922
adj. R^2	0.555	0.907	0.924	0.735	0.909
Firm FE	Yes	Yes	Yes	Yes	Yes
2-dig. sector X year FE	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

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

Table 12: Placebo Labor share components: treated firms and balanced panel

	Dependent variable				
	ln labor share	ln VA	ln wage bill	ln av. wages	ln num. workers
	(1)	(2)	(3)	(4)	(5)
$Tax\ haven\ Placebo_{ft}$	-0.00152	0.000214	-0.00131	-0.00138	0.0000734
	(0.00248)	(0.00465)	(0.00413)	(0.00247)	(0.00458)
MNE_{ft}	0.00439	0.0499^{a}	0.0543^{a}	-0.00602	0.0603^{a}
	(0.00403)	(0.00755)	(0.00666)	(0.00393)	(0.00738)
$MNE\ Lwc_{ft}$	0.00116	0.104^{b}	0.106^{b}	0.0243	0.0813^{b}
	(0.0173)	(0.0377)	(0.0351)	(0.0191)	(0.0396)
$Share\ skilled_{ft}$	0.0197	-0.214^{a}	-0.194^{a}	0.270^{a}	-0.464^{a}
	(0.0129)	(0.0286)	(0.0271)	(0.0163)	(0.0314)
$Num.\ Affiliates_{ft}$	-0.000160	0.00168^{b}	0.00152^{b}	0.00162^{a}	-0.0000972
	(0.000321)	(0.000635)	(0.000571)	(0.000324)	(0.000627)
$Export\ intensity_{ft}$	-0.0711^{a}	0.208^{a}	0.136^{a}	0.0453^{a}	0.0912^{a}
	(0.0111)	(0.0230)	(0.0201)	(0.0127)	(0.0223)
N	51670	51670	51670	51670	51670
adj. R^2	0.554	0.905	0.923	0.755	0.903
Firm FE	Yes	Yes	Yes	Yes	Yes
2-dig. sector X year FE	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

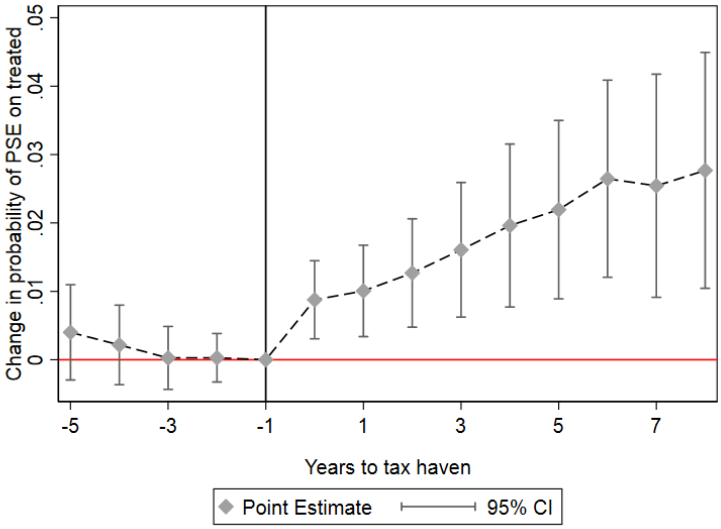
^{c} $p < 0.10$, ^{b} $p < 0.05$, ^{a} $p < 0.001$

6 Mechanisms

In this section we argue that the mechanism at play is the "opacity effect" instead of the "tax effect" by showing that the job cuts and tax haven entry nexus is not explained by an increase in capital intensity but rather by a restructuring decision triggering mass layoffs procedures, which French labor law only allows in case of "real and serious economic difficulties". Finally, we show that these developments are exclusively related to tax haven foreign investment and not to other foreign investments.

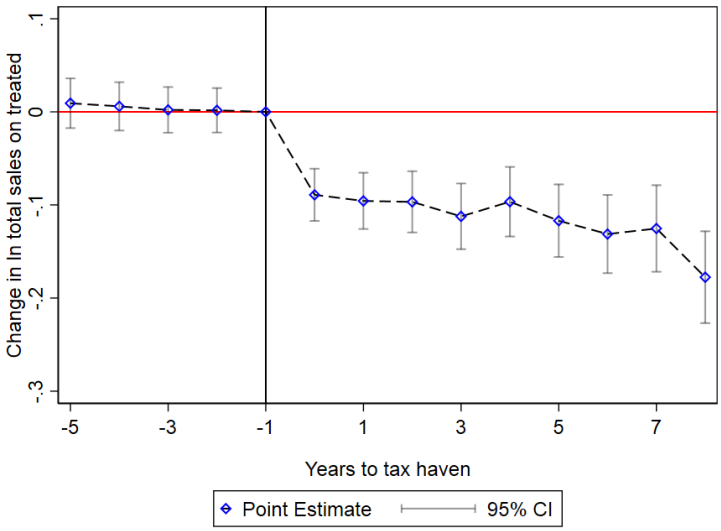
[TABLE MECHANISMS HERE]

Figure 16: PSE (mass lay off procedure) and tax haven entry



PSE, Plan de Sauvegarde de l'Emploi

Figure 17: Total Sales and tax haven entry



PSE, Plan de Sauvegarde de l'Emploi

Figure 18: Capital stock and tax haven entry

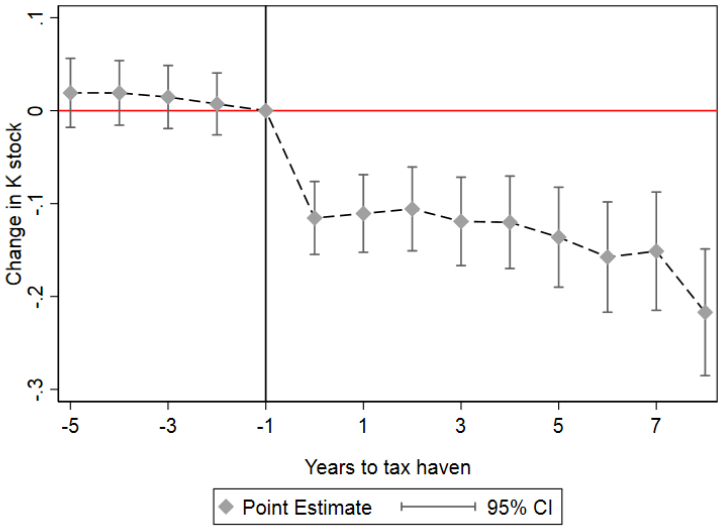


Figure 19: EBIDTA and tax haven entry

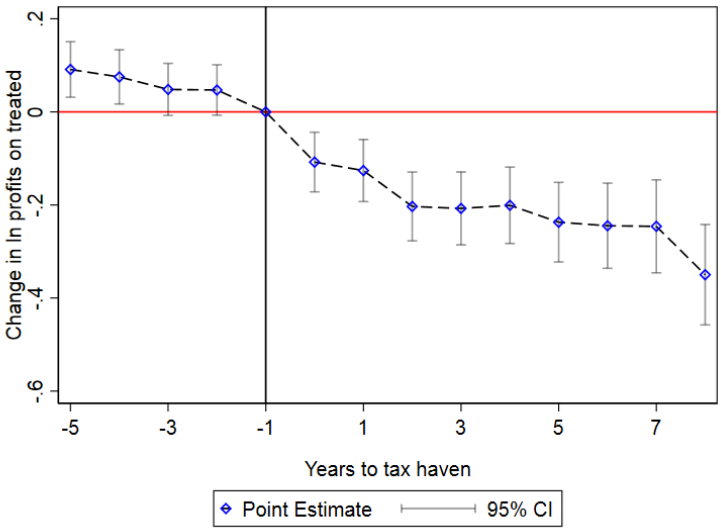
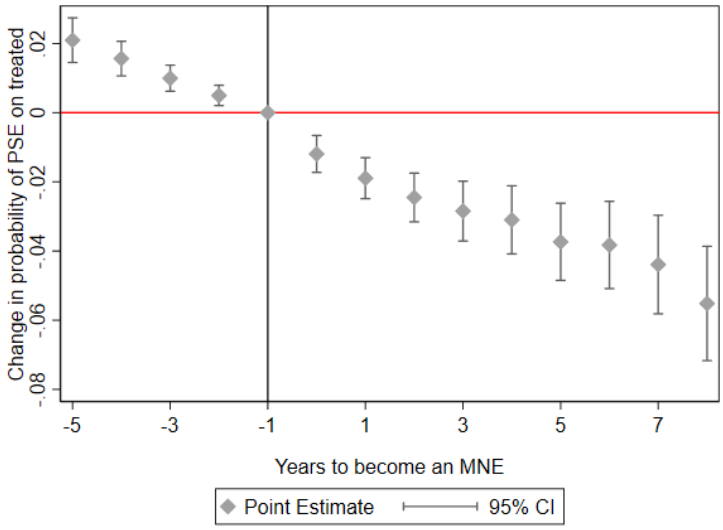


Figure 20: PSE and becoming an MNE (excluding tax havens)



PSE, Plan de Sauvegarde de l'Emploi

Figure 21: Number of workers and becoming an MNE (excluding tax havens)

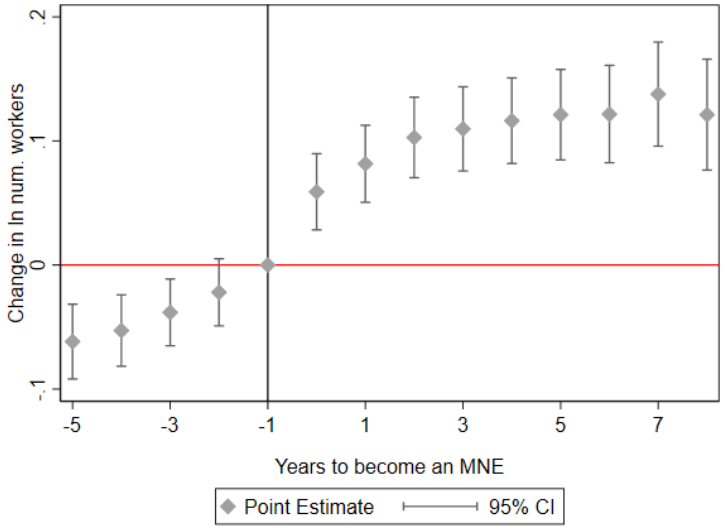


Figure 22: Wage bill and becoming an MNE (excluding tax havens)

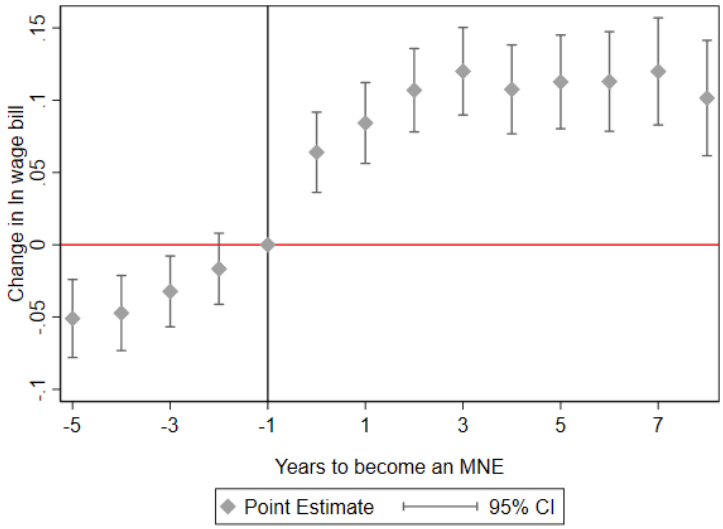


Figure 23: Capital stock and becoming an MNE (excluding tax havens)

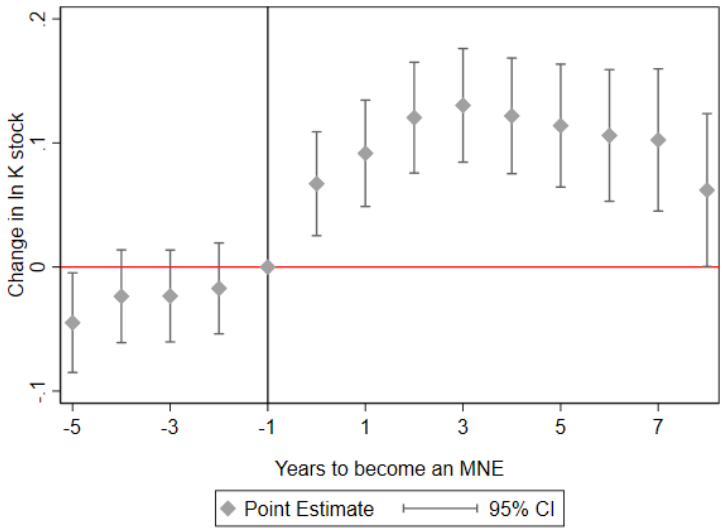
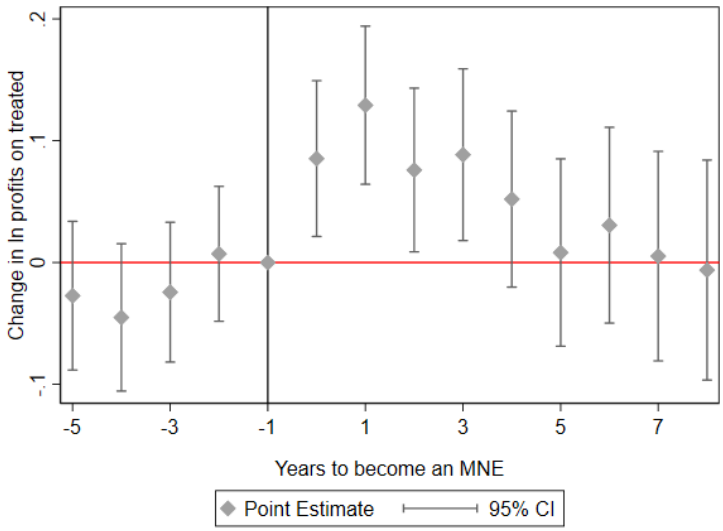


Figure 24: EBIDTAand becoming an MNE (excluding tax havens)



7 From Micro to Macro: aggregate labor share

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.[33] In this sense, this section aims at assessing the share of the aggregate variation of labor share that can be explained by micro-level fiscal optimization of MNEs. We do so with the help of our regression results from previous section, the tax haven MNEs' weights on total employment and the change in the proportion of firms who have become tax haven MNEs over the sample period.

Predicted aggregate labor share. We begin by computing the observed change in aggregate labor share, next we compute the predicted change in aggregate labor share which should have occurred had not MNEs had a presence in tax havens. Finally we compute the difference between these two aggregates, which gives us an approximation of the increase of aggregate labor share that is due to the micro-level offshore PS of MNEs. Aggregate labor share (LS_t), which is defined as the share of value added that rewards labor -in the form of wages ($\frac{W}{VA}$), in a given year t can be expressed as the weighted sum of individual labor shares, as follows,

$$LS_t = \sum_i \omega_{i,t} \cdot LS_{i,t} = \frac{\sum_i W_{i,t}}{\sum_i VA_{i,t}}$$

where LS_{it} is the individual labor share, can be expressed both in logs or levels and where ω_{it} is the size weight of the firm which can be value added, sales or inputs. In the case where LS_{it} is measured in levels and the weights are value added shares, LS_t measures aggregate labor share. This particular choice has thus the advantage that the aggregate labor share measure that results from the firm-level measure can have a direct data counterpart.[34] Additionally, one can express aggregate labor share in terms of the contribution of firms following their status as domestic or non-tax haven MNEs (NT) on the one hand and, and tax haven MNEs (TH) on the other hand,

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

[34] More specifically, if aggregate labor share is given in levels and value added is the chosen weight, such that $\omega_{i,t} = \frac{VA_{i,t}}{\sum_i VA_{i,t}}$, one has that the weighted average exactly corresponds to the aggregate LS:

$$LS_t = \frac{\sum_i W_{i,t}}{\sum_i VA_{i,t}} = \frac{\sum_i W_{i,t} \cdot \frac{VA_{i,t}}{VA_{i,t}}}{\sum_i VA_{i,t}} = \sum_i \left(\frac{W_{i,t}}{VA_{i,t}} \cdot \frac{VA_{i,t}}{\sum_i VA_{i,t}} \right) = \sum_i \omega_{i,t} \cdot LS_{i,t}$$

$$LS_t = \sum_{i \in NT,t} (\omega_{i,t}^{NT} LS_{it}^{NT}) + \sum_{i \in TH,t} (\omega_{i,t}^{TH} LS_{it}^{TH})$$

where the aggregate change in labor share between 1997 and 2014 is given by the difference of each groups' contribution to the weighted average labor share in levels in 1997 and in 2014, as follows,

$$\begin{aligned} \Delta LS_{97-14} = LS_{14} - LS_{97} &= \sum_{i,14} (\omega_{i,14} LS_{i,14}) - \sum_{i,97} (\omega_{i,97} LS_{i,97}) \\ &= \sum_{i \in NT,14} (\omega_{i,14}^{NT} LS_{i,14}^{NT}) - \sum_{i \in NT,97} (\omega_{i,97}^{NT} LS_{i,97}^{NT}) \\ &+ \sum_{i \in TH,14} (\omega_{i,14}^{TH} LS_{i,14}^{TH}) - \sum_{i \in TH,97} (\omega_{i,97}^{TH} LS_{i,97}^{TH}) \end{aligned} \tag{4}$$

Our econometric results imply that if every MNE that established a new presence in a tax haven between 1997 and 2014 had decided not to, its predicted labor share in 2014 would have been on average 2.3% lower. Thus, the predicted aggregate labor share change in levels is given by the following expression,

$$\begin{aligned} \Delta \widehat{LS}_{97-14} = &\sum_{i \in NT,14} (\omega_{i,14}^{NT} LS_{i,14}^{NT}) - \sum_{i \in NT,97} (\omega_{i,97}^{NT} LS_{i,97}^{NT}) \\ &+ \sum_{i \in TH,14} \omega_{i,14}^{TH} \underbrace{LS_{i,14}^{TH}}_{\text{observed}} \underbrace{[1 - |exp(\widehat{\beta}^{TH}) - 1|]}_{\text{predicted overestimation}} - \sum_{i \in TH,97} (\omega_{i,97}^{TH} LS_{i,97}^{TH}) \end{aligned} \tag{5}$$

where $\widehat{\beta}_{TH}$ is the estimated coefficient from equation (1), which is equal to 0.022, and the expression "predicted overestimation" is the only thing that changes with respect to equation 4.[35] This term represents the loss in labor share that we would have observed had THMNEs not been present in a tax haven. Table 13 displays the observed aggregate labor share in 1997 and in 2014, the difference between these two aggregates, the predicted aggregate labor share in 2014 if THMNEs had not been present in tax havens and the predicted change with respect to 1997.

[35] This coefficient corresponds to the tax haven entry dummy in our preferred equation (1), whose result is displayed in column (6) in Table 6.

Given the choices made to calculate the aggregate, LS represents the amount of euros that go to wages per euro of value added (in our sample), which tantamount to 69.26 euros in 1997 and 74.42 in 2014.[36] Thus, we observe an increase of 5.16 percentage points (pp) in the aggregate labor share between 1997 and 2014.

Our econometric estimates imply that the predicted aggregate labor share in 2014, $\widehat{LS}_{15}$, would have been 74.07 if we had not observed firms in tax havens and everything else had remained equal.[37] In which case, the predicted difference with respect to 1997 is 4.81 pp. Thus, we find a 36 basis points difference between the predicted aggregate labor share change and the observed one. This difference represents about 7.3% of the labor share that we would have observed if MNEs did not use tax havens over the period.[38] This suggests that the increase in labor share due to PS has a rather limited macro effect.

Nonetheless, as we observed in the previous sections, this effect is the result of two competing effects of tax haven presence on firm labor shares: a strong negative effect on the numerator and an even stronger effect on the denominator. Indeed, the novel finding of this paper is that when firms go to tax havens, they significantly reduce their total wage bill in France. Thus, despite the fact that firms reduce their total wage bill when going to tax havens, the negative effect of tax haven presence on firm value added, the ratio denominator, more than compensates the negative effect on the numerator. This in turn, results in a positive effect on firm labor shares.

[36] It is worth noting that our sample is composed of firms in the market economy who have at least one employee, it excludes therefore public administrations and self-employed. Additionally we drop some specific sectors and firms after the data cleaning. This means that aggregate labor share does not necessarily coincide with official statistics.

[37] The weights used for these calculations are displayed in Tables 22 and 23.

[38] This number reflects the predicted difference in aggregate labor share changes as a percentage: abs(4.81-5.16)/4.81=7.28.

Table 13: Observed and Predicted Aggregate Labor Share

	LS_{97}	LS_{14}	ΔLS_{97-14}	$\widehat{LS}_{14}$	$\Delta\widehat{LS}_{97-14}$
$LS = \frac{\sum_i W_i}{\sum_i VA_i}$	69.26	74.42	5.16	74.07	4.81

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

8 Conclusion

In this paper we argue that the evolution of the aggregate labor share, which measures how income is distributed between workers and shareholders, is overestimated in high tax economies due to MNEs' profit-shifting. More specifically, using French firm-level data over 1997 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. Next, we use our micro estimates to calculate the aggregate effect of MNEs' presence in tax havens on the market economy labor share in France. First, we find that when an MNE goes to a tax haven, its domestic labor share increases on average by 2.3%, relative to the years before the tax haven presence. Our results are robust to an alternative DID estimator, to a placebo test, where tax haven entry is artificially randomly reassigned and to control variables accounting for alternative explanations of a positive evolution of labor share in MNEs, such as higher rent-sharing and offshoring of low-skilled labor. An event-study design shows that our estimates capture the tax haven entry effect and not differential trends between treated and control units. Second, due to these firms' weight in the economy, this micro-level effect represents around 7.3% of the observed increase in the aggregate labor share in France over the sample period.

Nonetheless, the 2.3% increase in firms' labor share is the result of two competing effects of MNEs' presence in tax havens. One on the numerator and another on the denominator. On

the one hand, the firms' value added, the denominator, experiences an average drop by 10.2%, which seems to be partly explained by profit-shifting and partly by a real decline in domestic activity. Indeed, the total wage bill decreases on average by 8.2% when MNEs enter a tax haven and this effect is almost completely explained by a strong decline in employment, equivalent to -7.7%, rather than a decline on average firm wages, which are not altered by profit-shifting.

We show that these developments are not explained by an increase in capital intensity, where the "tax effect" translates into a a lower capital cost by showing that capital also experiences a sharp decline when MNEs enter a tax haven. We argue that the mechanism at play is the "opacity effect" by showing that the job cuts and tax haven entry nexus is linked to a restructuring decision triggering mass layoffs procedures, which French labor law only allows in case of "real and serious economic difficulties". Thus, we argue that there can be at least two non-mutually exclusive explanations for such a link between tax haven entry and job cuts. On the one hand, we suggest that a plausible explanation these results is that "tax liability issues are intertwined with employer responsibility issues", as trade unionist, whistle-blowers and professional lawyers claim. This may be particularly true, in a country such as France, where mass lay-offs can be very expensive for big and healthy firms. Under costly domestic employment protection, opacity in tax havens provides incentives for MNEs for using tax haven subsidiaries in order to avoid expensive employer liabilities related to mass lay-offs. Indeed, beyond beyond fiscal benefits, tax havens usually offer financial secrecy. On the other hand, a simultaneous drop in employment and a tax haven entry can be triggered by a business restructuring decision, following for instance an accounting firm's consultancy. Finally, we show that these developments are exclusively related to tax haven foreign investment and not to other foreign investments, pointing to a group restructuring that is systematically and exclusively related to tax haven entry.

All in all, our results show that in a high tax country with a strong social protection such as France, assessing the labor share effect of MNEs' presence in tax havens, requires not only accounting for the mismeasurement in value added, and therefore the overstatement of the labor share due to profit-shifting. One also has to account for its real effects in terms of employment losses, whose severance payments may be transferred to the tax payers, which can exacerbate

inequalities between workers and shareholders. Even if more research is needed, our findings have important implications for current debates on how offshore finance and financial secrecy can act like a shield against liability and accountability to stakeholders other than shareholders.

Appendix A Appendix

A.1 Descriptive statistics

Table 14: 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`

Figure 25: Statutory Corporate tax rate

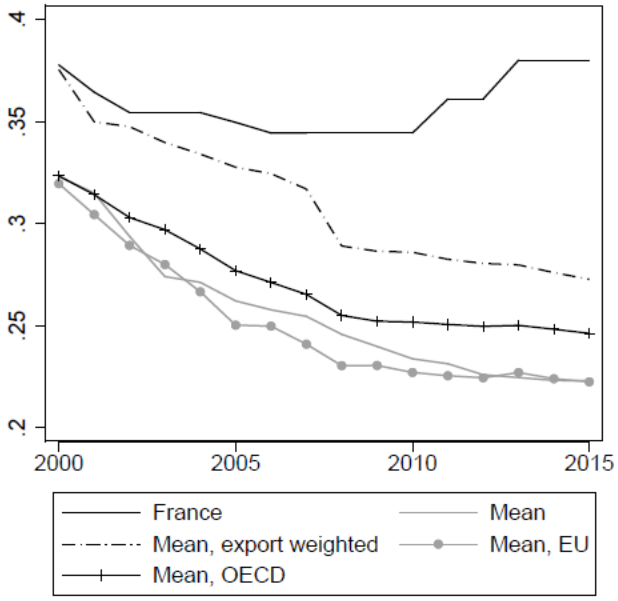


Table 15: Firm-type average labor share by TFP deciles

	TFP decile									
	1	2	3	4	5	6	7	8	9	10
Domestic	1.02	0.86	0.81	0.78	0.76	0.73	0.71	0.68	0.64	0.59
MNE non Tax haven	1.23	1.12	1	0.93	0.88	0.84	0.8	0.76	0.7	0.67
MNE Tax haven	1.18	1.1	1	0.92	0.87	0.83	0.79	0.75	0.7	0.67

Source: FICUS-FARE and LIFI.

Table 16: 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 17

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).

A.2 Kolmogorov-Smirnov test

The Kolmogorov-Smirnov test allows concluding whether one cumulative distribution lies to the right of another one. The firm labor share distribution in each period (before and after tax haven entry) is therefore ranked according to the concept of first-order stochastic dominance, and the (one- and two-sided) KS-statistics formally test their difference. More specifically, let $B(z)$ and $A(z)$ denote the cumulative distribution functions of the labor share of firms before and after they enter tax haven, respectively, where the hypothesis to be tested is whether both distributions are identical. This is done with the help of the two-sided KS test:

$H_0 : B(z) - A(z) = 0 \ \ \forall\, z \in \mathbb{R}$ versus the alternative hypothesis,
$H_0 : B(z) - A(z) \neq 0$ for some $z \in \mathbb{R}$

while the one-sided KS test allows testing whether $B(z)$ stochastically dominates $A(z)$, which is formulated as follows:

$H_0 : B(z) - A(z) \leq 0 \ \ \forall\, z \in \mathbb{R}$ versus the alternative hypothesis,
$H_0 : B(z) - A(z) > 0$ for some $z \in \mathbb{R}$

In this sense, if the two-sided test is rejected while the one-sided test isn't, one can conclude that the labor share distribution of firms after tax haven entry lies to the right of the labor share distribution of firms before tax haven entry, thereby implying a first-order stochastic dominance of period 2 over period 1.

Table 18: Two-sample K-S test of equality of distributions on ln LS

Smaller group	D	P-value
Period 1 (before tax haven entry) :	0.0949	0.000
Period 2 (after tax haven entry):	-0.0027	0.853
Combined K-S:	0.0949	0.000

Note: Authors' calculations. D is the largest distance between the distributions functions.

The first line tests the hypothesis that ln labor share for period 1 contains smaller values than for period 2. The largest difference between the distribution functions is 0.09 and the p-value for this difference is statistically significant at the highest levels of acceptance. The second line tests the hypothesis that ln labor share for period 1 contains larger values than for period 2. The largest difference between the distribution functions in this direction is -0.0027, and the p-value for this difference is not significant.

A.3 Additional Tables

Table 19: Whole sample of MNES

	Dependent variable: ln labor share					
	(1)	(2)	(3)	(4)	(5)	(6)
$Tax\ haven_{ft}$	0.00445^{b}	0.00723^{b}	0.0115^{a}	0.00810^{a}	0.0143^{a}	0.0134^{a}
	(0.00209)	(0.00223)	(0.00207)	(0.00222)	(0.00221)	(0.00243)
MNE_{ft}		-0.00180		0.00767^{a}		0.00129
		(0.00139)		(0.00140)		(0.00147)
$MNE\ Lwc_{ft}$		0.0281^{a}		0.0237^{b}		0.0174^{b}
		(0.00844)		(0.00826)		(0.00855)
$Share\ skilled_{ft}$		0.131^{a}		0.0886^{a}		0.0557^{a}
		(0.00248)		(0.00315)		(0.00443)
$Num.\ Affiliates_{ft}$		-0.000889^{a}		-0.00138^{a}		-0.0000177
		(0.000160)		(0.000184)		(0.000208)
$Export\ intensity_{ft}$		-0.0441^{a}		-0.0403^{a}		-0.0651^{a}
		(0.00234)		(0.00247)		(0.00412)
N	424217	410075	424165	410019	423521	409078
adj. R^2	0.010	0.018	0.052	0.057	0.522	0.529
Firm FE	No	No	Yes	No	No	Yes
2-dig. sector X year FE	No	Yes	Yes	No	Yes	Yes
Year dummies	Yes	No	No	Yes	No	No

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

Table 20: Labor share components: dynamics

	Dependent variable				
	ln labor share	ln VA	ln wage bill	ln av. wages	ln num. workers
	(1)	(2)	(3)	(4)	(5)
MNE_{ft}	-0.0103^{c}	0.117^{a}	0.106^{a}	-0.00351	0.110^{a}
	(0.00545)	(0.0103)	(0.00903)	(0.00535)	(0.0103)
$MNE\ Lwc_{ft}$	0.00490	0.0885^{b}	0.0934^{b}	0.0242	0.0691^{c}
	(0.0173)	(0.0374)	(0.0349)	(0.0192)	(0.0393)
$Share\ skilled_{ft}$	0.0181	-0.208^{a}	-0.189^{a}	0.270^{a}	-0.459^{a}

Continued on next page

Table20– continued from previous page

	Dependent variable				
	ln labor share	ln VA	ln wage bill	ln av. wages	ln num. workers
	(1)	(2)	(3)	(4)	(5)
	(0.0129)	(0.0286)	(0.0271)	(0.0163)	(0.0315)
$Num.\ Affiliates_{ft}$	-0.000278	0.00205^{b}	0.00177^{b}	0.00163^{a}	0.000147
	(0.000320)	(0.000625)	(0.000564)	(0.000324)	(0.000618)
$Export\ intensity_{ft}$	-0.0704^{a}	0.207^{a}	0.136^{a}	0.0450^{a}	0.0912^{a}
	(0.0111)	(0.0230)	(0.0201)	(0.0126)	(0.0223)
Lag 6	-0.0129	0.0222	0.00932	0.0199^{b}	-0.0106
	(0.00838)	(0.0160)	(0.0142)	(0.00823)	(0.0156)
Lag 5	-0.00890	0.0171	0.00816	0.0171^{b}	-0.00889
	(0.00810)	(0.0142)	(0.0123)	(0.00767)	(0.0138)
Lag 4	-0.0145^{c}	0.0185	0.00406	0.00484	-0.000779
	(0.00738)	(0.0136)	(0.0119)	(0.00733)	(0.0133)
Lag 3	-0.0000570	0.00622	0.00617	0.00666	-0.000491
	(0.00732)	(0.0129)	(0.0114)	(0.00708)	(0.0125)
Lag 2	0.00392	-0.000885	0.00304	0.00625	-0.00321
	(0.00698)	(0.0126)	(0.0111)	(0.00689)	(0.0123)
Lead 0	0.0118	-0.110^{a}	-0.0979^{a}	0.00114	-0.0991^{a}
	(0.00823)	(0.0150)	(0.0132)	(0.00808)	(0.0147)
Lead 1	0.0271^{b}	-0.122^{a}	-0.0953^{a}	-0.000530	-0.0947^{a}
	(0.00871)	(0.0159)	(0.0140)	(0.00814)	(0.0156)
Lead 2	0.0478^{a}	-0.135^{a}	-0.0867^{a}	-0.00297	-0.0837^{a}
	(0.00949)	(0.0172)	(0.0151)	(0.00913)	(0.0169)

Continued on next page

Table20– continued from previous page

	Dependent variable				
	ln labor share	ln VA	ln wage bill	ln av. wages	ln num. workers
	(1)	(2)	(3)	(4)	(5)
Lead 3	0.0553^{a}	-0.155^{a}	-0.0998^{a}	0.00644	-0.106^{a}
	(0.0104)	(0.0184)	(0.0160)	(0.00955)	(0.0184)
Lead 4	0.0400^{a}	-0.133^{a}	-0.0932^{a}	-0.00136	-0.0918^{a}
	(0.0104)	(0.0192)	(0.0168)	(0.00990)	(0.0192)
Lead 5	0.0450^{a}	-0.148^{a}	-0.103^{a}	-0.00751	-0.0953^{a}
	(0.0113)	(0.0204)	(0.0180)	(0.0120)	(0.0214)
Lead 6	0.0544^{a}	-0.165^{a}	-0.110^{a}	-0.0220^{c}	-0.0885^{a}
	(0.0122)	(0.0223)	(0.0194)	(0.0119)	(0.0220)
Lead 7	0.0390^{b}	-0.138^{a}	-0.0986^{a}	-0.0277^{b}	-0.0709^{b}
	(0.0130)	(0.0240)	(0.0212)	(0.0126)	(0.0235)
Lead 8	0.0623^{a}	-0.194^{a}	-0.131^{a}	-0.0261^{c}	-0.105^{a}
	(0.0141)	(0.0257)	(0.0227)	(0.0138)	(0.0264)
Lead 9	0.0818^{a}	-0.261^{a}	-0.180^{a}	-0.0112	-0.168^{a}
	(0.0134)	(0.0256)	(0.0227)	(0.0129)	(0.0249)
N	51670	51670	51670	51670	51670
adj. R^2	0.555	0.906	0.924	0.755	0.903
Firm FE	Yes	Yes	Yes	Yes	Yes
2-dig. sector X year FE	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

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

Table 21: Placebo

	Dependent variable: ln labor share					
	(1)	(2)	(3)	(4)	(5)	(6)
$Tax\ haven\ Placebo_{ft}$	0.00150	0.00110	0.000535	0.00101	0.000753	0.000544
	(0.00202)	(0.00198)	(0.00148)	(0.00203)	(0.00199)	(0.00148)
MNE_{ft}				-0.000225	0.00947^{a}	0.00448^{b}
				(0.00255)	(0.00250)	(0.00182)
$MNE\ Lwc_{ft}$				0.0281^{c}	0.0236	0.0163
				(0.0167)	(0.0155)	(0.0114)
$Share\ skilled_{ft}$				0.131^{a}	0.0884^{a}	0.0557^{a}
				(0.00514)	(0.00614)	(0.00610)
$Num.\ Affiliates_{ft}$				-0.000870^{b}	-0.00136^{b}	0.0000150
				(0.000402)	(0.000443)	(0.000330)
$Export\ intensity_{ft}$				-0.0443^{a}	-0.0404^{a}	-0.0652^{a}
				(0.00550)	(0.00563)	(0.00570)
N	424217	424165	423521	410075	410019	409078
adj. R^2	0.010	0.052	0.521	0.018	0.057	0.529
Firm FE	No	No	Yes	No	No	Yes
2-dig. sector X year FE	No	Yes	Yes	No	Yes	Yes
Year dummies	Yes	No	No	Yes	No	No

Robust standard errors in parentheses

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

Table 22: Employment and value added share of tax haven MNEs in total economy

	Average 1997-2015	1997	2015
Employment	12.7	14.3	11.4
Value added	16.1	19.6	16.4

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

Table 23: Total Employment and value added tax haven MNEs

	Average 1997-2015	1997	2015
Tax haven MNE employment	1 558 985	1 359 957	1 583 659
Tax haven MNE value added	108 529	87 531	134 315
Total employment	12 239 148	9 494 977	13 842 753
Total value added	679 394	447 060	821 361

Source: Authors' calculations using LIFI and FICUS-FARE databases. Value added in million euro.

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