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The Most Complex Multinationals Engage in Tax Avoidance

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Tax avoidance by multinationals made headlines in 2021 with the international agreement on reforming the taxation of multinational enterprises. While the importance of the issue is no longer debated, little is known about which firms are most likely to engage in tax avoidance. It turns out that the complexity of the ownership structure of the subsidiaries of a multinational firm – be it a flat structure in which headquarters directly owns its subsidiaries or a more complex organization involving chains of ownership – plays an important role in these schemes: only sufficiently complex multinationals shift profits from their high-tax subsidiaries to those located in low-tax countries.

In July 2021, international negotiations under the auspices of the OECD led to an agreement on reforming the tax system of multinational enterprises (MNEs) by 2024. The aim is to limit tax avoidance, occurring notably through profit-shifting from high- to low-tax subsidiaries.[1] As an illustration, in 2016, 36% of multinationals' foreign profits were shifted to tax havens, particularly in Europe.[2] In France, tax avoidance represented a revenue loss of around €36 billion in 2015, corresponding to potential losses of almost a quarter of corporate tax revenues.[3] Understanding in detail the tax strategies of multinationals remains a challenge in fully implementing these new rules against tax avoidance, and thus for public finances. However, the characteristics of the companies most involved in such schemes are still not well known. Among them, the ownership structure of the subsidiaries of these multinational firms seems to play a major role.[4] Does a more complex ownership structure – i.e. when the parent company holds its subsidiaries through chains of holdings, potentially spanning several countries – facilitate the implementation of tax strategies to shift profits from high- to low-tax subsidiaries?

Multinationals differ in ownership structure

The universe of multinational firms is very heterogeneous, both in terms of the number of subsidiaries and the complexity of their organization. Most have a relatively simple structure, involving a limited number of subsidiaries held directly by the headquarters. Thus, among the 66,539 multinationals that reported at least one subsidiary in the European Union in 2018, 62% had fewer than five subsidiaries (Figure 1), among which 23% had only one, and accounted for less than 10% of value added, employment, and assets. At the other end of the spectrum, only 3% of multinational reported more than 100 subsidiaries, accounting for 47% of subsidiaries and nearly two-thirds of value added, employment and assets.

Beyond the number of subsidiaries held by their parent company, multinationals differ in their ownership structure, and therefore in their degree of complexity, which is measured by taking into account the average distance between the parent company and its subsidiaries (see box below). A total of 52%

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1. A subsidiary is a company that is more than 50% owned, directly or indirectly, by a parent company.
2. Tørsløv, T., Wier, L. & Zucman, G. (2022). The Missing Profits of Nations. *Review of Economic Studies*, forthcoming.
3. Vicard, V. (2022). Profit shifting, returns on foreign direct investments and investment income imbalances. *IMF Economic Review*, forthcoming, forthcoming..
4. The results presented in this Letter are from: François, M. & Vicard, V. (2023). Tax Avoidance and the Complexity of Multinational Enterprises. *CEPII Working Paper*, No. 2023-04, February.

of MNEs have a complexity measure equal to 1, representing a perfectly horizontal structure in which the headquarters directly own all its subsidiaries. In contrast, a small number of multinationals have a more complex ownership structure involving several intermediaries between headquarters and subsidiaries; only 11% of multinational firms have more than two intermediaries, and 0.5% have at least one subsidiary held through 9 intermediaries.

Figure 1 – Multinationals with more than 100 subsidiaries are few in number, but they represent the majority of employment and value added

Shares in total multinationals that reported at least one subsidiary in the European Union in 2018, by number of subsidiaries

Note: When missing for an enterprise, the shares in value added, employment and assets are estimated by imputing the average value for the category.

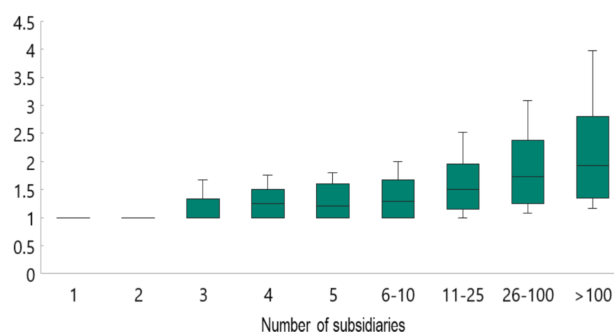
Reading note: Multinational enterprises with between 5 and 10 subsidiaries account for 15% of multinationals, 7% of all subsidiaries, 4% of value added, 3% of employment, and 2.5% of total assets of all 66,539 multinationals that reported at least one subsidiary in the European Union.

Source: Authors' computation using Orbis.

Taking a bottom-up approach from the subsidiary level, these complex ownership structures imply that, for almost 40% of them, the direct holder is located in a country other than the headquarters, thus implying investment chains that cross borders and blur the nationality of investors[5] Obviously, the degree of complexity of a multinational and its size (measured by the number of subsidiaries) are related. The median complexity is equal to 1 (simplest possible structure) for firms with fewer than three subsidiaries, while it reaches almost 2 for those with more than one hundred subsidiaries. This relationship is partly mechanical, since the implementation of complex holding chains requires a sufficient number of subsidiaries. However, for a given size, there is a great deal of heterogeneity in the degree of complexity of multinationals. Among those with more than 100 subsidiaries, the bottom 10% have an almost flat structure with a degree of complexity of less than 1.2, while the most complex 10% have a degree of complexity of at least 4 (Figure 2). Similarly, for multinationals with between 11 and 25 subsidiaries, the first complexity decile is equal to 1, the median is 1.5, and the ninth decile is 2.5.

Figure 2 – Multinational firms' complexity increases with size, but remains heterogeneous within size bins

Complexity of multinational firms' ownership structure in 2018, depending on their number of subsidiaries



Notes: The line inside the rectangle represents the median; the lower and upper sides of the rectangle the 1st and 3rd quartile; the ends of the box whiskers the 1st (bottom) and 9th (top) deciles. For multinationals with two subsidiaries, the 9th decile equal to 1.5 does not appear on the graph because the length of the whisker (which cannot exceed 1.5 times the interquartile range) is in this case equal to 0.

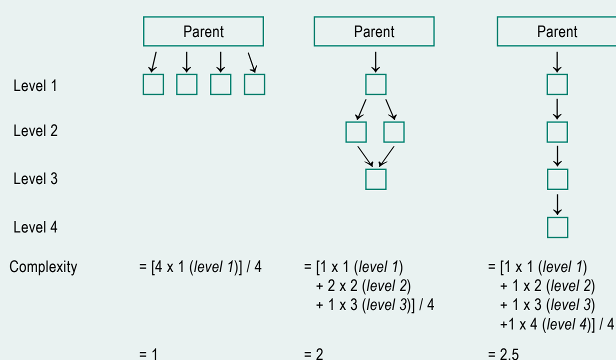
Source: Authors' computation using Orbis.

Box – Measuring the complexity of multinationals' ownership structure

The complexity of the ownership structure of a multinational is measured based on two criteria: the length of holding chains and the number of subsidiaries at each level of ownership. The proximity of a subsidiary to its headquarters determines its ownership level within the multinational. A strong proximity to headquarters (i.e. a direct link) characterizes the first level of the ownership chain. The further away a subsidiary is from headquarters (i.e. it is separated from the headquarter by several intermediaries), the longer the chain of ownership.

The degree of complexity of a multinational enterprise is computed as the average level of ownership of all subsidiaries within the group, thus giving greater weight to the levels where there are more subsidiaries. The figure 2 illustrating our measure of complexity shows that a multinational with 4 subsidiaries and a perfectly flat structure (i.e. with a direct link to the group head) will have a degree of complexity equal to 1. On the other hand, a multinational with 4 subsidiaries held by a perfectly vertical ownership chain, in this case with 4 layers of ownership, will have a higher complexity of 2.5.

Figure – Measuring the complexity of ownership networks



5. Alabrese, E. & Casella, B. (2020). The Blurring of Corporate Investor Nationality and Complex Ownership Structures. *Transnational Corporations*, vol. 27(1).

The degree of complexity with which multinationals organize their ownership structure is therefore only partly related to their size. A large number of subsidiaries does not necessarily imply a high degree of complexity, and *vice versa*.

How can complexity facilitate tax avoidance?

The ownership structure of multinationals is directly associated with the organization of production, but may also result from its history through the legacy of mergers and acquisitions or financial determinants. It is also directly linked to tax considerations, as shown by most well-known tax schemes that feature chains of ownership involving subsidiaries in tax havens. Complex ownership structures are complementary to instruments of profit-shifting between subsidiaries, aimed at reducing the tax paid at group level.

Multinational firms use three main instruments to shift profits from high- to low-tax subsidiaries: transfer pricing manipulation between subsidiaries, intra-group debt-shifting, and the location in tax havens of intangible assets whose use is charged to other subsidiaries. All of these instruments require transactions between subsidiaries, either real or financial, but do not require any particular ownership link between the subsidiaries involved in tax avoidance schemes. The ownership structure and its complexity therefore do not play a direct role in profit-shifting between subsidiaries.

Regardless of the subsidiary in which they are reported, profits are then distributed through dividends to the headquarters and to shareholders, a distribution that may give rise to taxation in the source country or in the country of the headquarters. This is where the ownership structure of the multinational firm comes into play as it can be designed so as to minimize the tax on dividends repatriated to headquarters. By interposing a firm between the headquarters and its subsidiary, and locating it in a jurisdiction that has favorable tax treaties with the country of the subsidiary and the country of the headquarters, a multinational can take advantage of specific provisions that reduce the tax paid on dividends and other passive incomes. This scheme, known as "treaty shopping", allows multinationals to take advantage of lower taxation using investment chains through third countries, thus complicating the ownership structure of their subsidiaries. A famous example of such treaty shopping is the so-called "double Irish with a Dutch sandwich" scheme, orchestrated by several US multinationals in the 2000s and 2010s, which required two Irish subsidiaries, one tax-resident in Bermuda and the other tax-resident in Ireland and wholly owned by the former, and a Dutch subsidiary.[6]

Such treaty-shopping practices are based on a network of more than 3,500 bilateral tax treaties in force worldwide, whose initial aim was to prevent double taxation and to facilitate cross-border activities. They include specific provisions defining the tax treatment of income received abroad by residents of the two contracting authorities. However, they set out specific tax provisions at the bilateral level that allow multinationals to design investment chains that minimize their tax on the distribution of dividends. Treaty shopping is therefore complementary to profit-shifting between subsidiaries to locate profits in low-tax jurisdictions and then facilitate their repatriation once taxed in the host countries of the subsidiaries.

Complex holding structures also create opacity in the activities of the multinational groups, making it more difficult for tax administrations to track tax obligations. For tax authorities, the burden of collecting, already increased by complex structures, requires time-consuming collaborations between national administrations for MNEs located in several tax jurisdictions.

Only sufficiently complex multinationals transfer profits between their subsidiaries

By definition, tax avoidance cannot be observed directly. However, it is possible to investigate it through its consequences on the income statement of companies. By shifting profits between subsidiaries to reduce their level of taxation, multinationals change the apparent profitability of their subsidiaries. If, everything else equal, profitability is systematically lower for subsidiaries located in a high-tax country than for the rest of the group, this indicates a transfer of profits from the high-tax subsidiaries to those located in low-tax countries. Comparing the profitability of European subsidiaries of multinational enterprises within a given country and sector can therefore be used to detect tax avoidance.

To do this, we focus on one dimension of profitability, the propensity to report zero profits, since subsidiaries of multinationals tend to report zero profits in high-tax countries.[7] Of the 220,000 or so European subsidiaries of MNEs for which data is available, 10.2% report profits close to zero (defined as a return on assets of between -0.5% and 0.5 %). This concentration of profits of around zero in the companies' accounts can be explained by factors other than tax avoidance, but the fact remains that it is higher for subsidiaries of complex groups (whose degree of complexity is above the 9th decile): 12% of them report zero profits, compared to 9.8% for subsidiaries of less complex multinationals (whose degree of complexity is below the median). This difference, which is due to the characteristics of the group to which the subsidiaries belong, and not to the characteristics

6. Jones, C., Temouri, Y. & Cobham, A. (2018). Tax Haven Networks and the Role of the Big 4 Accountancy Firms. *Journal of World Business*, vol. 53(2), 177-193.
7. Bilicka, K. A. (2019). Comparing UK Tax Returns of Foreign Multinationals to Matched Domestic Firms. *American Economic Review*, vol. 109(8), 2921-2953.

of the subsidiary itself, is consistent with greater tax avoidance by complex multinational firms.

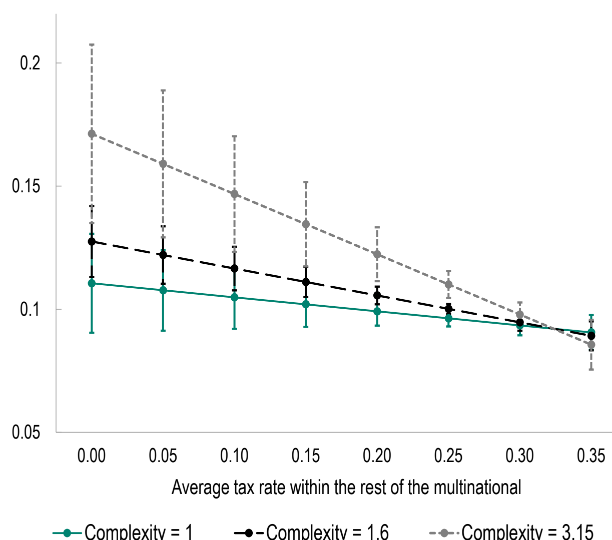
The complexity of the ownership structure thus seems to be an enabler of profit-shifting between subsidiaries. Going further, if high-tax subsidiaries are systematically more likely to report zero profits than those subject to lower taxation within an MNE, and the more so for complex MNEs, then it can be concluded that profit-shifting occurs more between subsidiaries of complex MNEs. This is what Figure 3 shows: subsidiaries belonging to groups with a complexity of 3.15 (the 90th percentile) have a 17% probability of reporting zero profits if the average tax rate of the rest of the group is zero, but only 9% if that tax rate is 35%. The lower the degree of complexity of the group, the weaker the relationship: for subsidiaries belonging to a multinational with a flat ownership structure (complexity equal to one), the probability of reporting zero profits no longer depends on the level of taxation of the subsidiaries.

These results highlight the complementarity between the MNE ownership structure and profit-shifting between subsidiaries: only multinationals with a sufficiently complex ownership structure appear to shift their profits away from their high-tax subsidiaries. It should also be noted that the location of the subsidiary in the network does not affect its profitability, consistently with tax strategies implemented at the MNE level and not specific to each subsidiary. At the group level, complexity appears to be the relevant dimension regarding tax avoidance, and not the size of the multinational, its productivity or its mere presence in tax havens.

Thus, multinational companies are not all equal with regard to tax avoidance: only the most complex multinationals appear to engage in profit-shifting, while a large proportion of multinationals have a limited number of subsidiaries and a flat organization. This suggests that promoting the dissemination of information on the structure of the network of subsidiaries to national tax administrations and other corporate stakeholders would be a policy that would facilitate reducing tax avoidance opportunities. Beyond the recent agreement on reforming the international tax system, another recent advance has been the obligation for large multinationals to report their operations to tax authorities on a country-by-country basis. The information on the ownership structure of subsidiaries is a useful complement to better target the controls of tax administrations.

Figure 3 – Only the most complex multinationals engage in tax avoidance

Probability of reporting zero profits depending on the tax rate in other subsidiaries within the MNE and by complexity of MNE



Notes: The complexity levels used here represent the first decile (1), the median (1.6) and the top decile (3.15).

Reading note: Subsidiaries belonging to multinationals with a 1.6 complexity measure have a 13% probability of reporting zero profits if the average tax rate within the rest of the multinational is zero, but a probability of 9% if the average tax rate is 35%.

Source: Francois et Vicard (2023).

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