

A Tiered Sales-Based Approach:

Digital Sequence Information and Monetary Contributions from Industry

This policy brief outlines the ‘two out of three’ metrics tiered sales-based approach to the calculation of monetary contributions from industry to the multilateral mechanism on digital sequence information under the United Nations Convention on Biological Diversity to be negotiated at the 16th Conference of the Parties. It is a result of exploratory research undertaken in the run up to the LSE Roundtable on Global Biodiversity Finance and Digital Sequence Information held in London on the 27th and 28th of September 2024. A short summary overview of the Roundtable discussions can be found in the ‘Ways Forward’ report.¹

¹ Identifying Ways Forward: The LSE Roundtable on Global Biodiversity Finance and Digital Sequence Information, October 16th 2024
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Building on the discussions during the LSE Roundtable, this analysis explores the pros and cons of charging a percentage of profits versus sales, particularly in relation to contributions from companies of different sizes across different economies. It highlights the potential challenges of profit-based models and proposes a tiered, sales-based approach to ensure fairness while protecting smaller firms¹ and encouraging innovation.

The terms sales, revenue and turnover are different words for the same thing. The real distinction is between profit and sales. The table below provides a brief overview of the arguments for and against each of the following metrics: profits, or sales (also known as revenue or turnover) a tiered approach including both profits and sales.

Table 1: Overview of pros and cons of different metrics

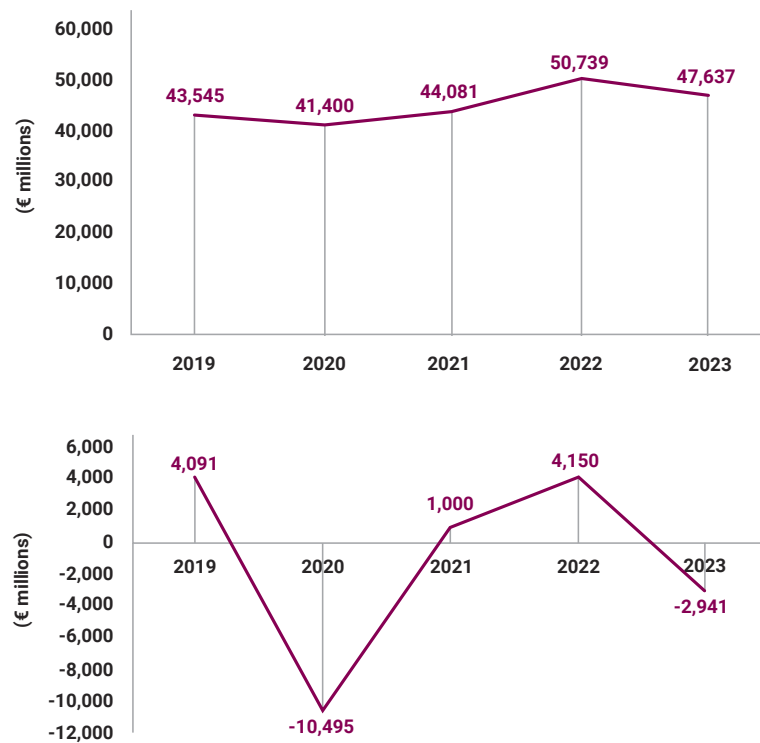
Metric	Pros	Cons
% of Profit Fixed % of profit across all companies	- Protects small, young start-up firms - Ease of implementation - Contribution is proportional to firms' success, without overburdening firms under financial strain - Does not hamper innovation - Flexible - allows companies of different sizes to contribute within their means - Possible to change iteratively over time with experience	- Large variability in profits across years may lead to unpredictable contributions to the mechanism - Where there are large fluctuations in profits, some large, successful firms may not be expected to contribute due to losses in a particular year (see Fig 1 example) - Lends itself to manipulation - Does not satisfy the principle of 'pay nature first', according to which use of DSI or biological resources constitutes an operational cost like any other
% of Sales (also known as revenue or turnover) Fixed % of profit across all companies	- Less likely to be manipulated - Less variable - Satisfies the principle of 'pay nature first'	- More burdensome on small young firms with little or no profits if the same % of sales is required from all firms - Potential to hamper innovation if too large
Tiered approach Different % of sales across large, medium, and small companies. Largest companies pay highest % of sales, while smallest companies pay lowest % of sales.	- Sales less likely to be manipulated - Protects small young firms by requiring lowest % of sales - Satisfies principles of fairness and of 'paying nature first'	Wide variation in the economic characteristics of firms across different economies will require the establishment of appropriate thresholds informed by economic modelling

It can be argued that charging a percentage of profits rather than a percentage of sales is fairer because in some ways it protects young start-up firms, where high R&D expenditures are common. These firms often generate sales while investing heavily in R&D, which delays profitability. If they were charged a percentage of sales, they would be burdened with fees despite not yet being profitable, putting pressure on their ability to fund critical R&D and innovation. A profit-based charge, however, accounts for their financial realities, allowing them to grow and innovate without stifling their development during the critical R&D phase and limits the burden on firms under financial strain, allowing them to improve their financial health without incurring excessive costs.

¹ In this document although we use the terminology of firms and companies, we are referring to all entities, and not just business corporations.

However, there are several drawbacks to using profits as the basis for generating funds. Profits can be manipulated to meet or beat certain thresholds, also known as earnings management.² Profits also fluctuate significantly year-on-year and will cause the amount of funds raised to vary. For example, in the figure below depicting sales and profits (net income) of Bayer Group from 2019-2023, we can see that the variability in profits is much more than that of sales. In addition, top performing companies like Bayer can have years in which they do not generate any profits (e.g. 2023), and hence would not pay into the fund. A large successful company not contributing into the fund could violate the principle of fairness.

Figure 1: Depiction of variability of sales and profits



Source: Data from annual report of Bayer, 2023

Thus, sales might offer a better alternative. Sales has the benefit of being less manipulable, less variable and sales data is more widely available to the public.³ Furthermore, asking entities to pay a percentage of sales may be appropriate based on the principles of 'paying nature first'⁴, and treating contributions to the DSI fund as a pre-profit cost of doing business (i.e. operational cost).

However, asking all entities to pay the same percentage of sales might affect smaller/younger/start-up entities negatively. It could create barriers to entry. To overcome this, we recommend a model that separates the firms into three tiers. This model is depicted in **Figure 2** below.

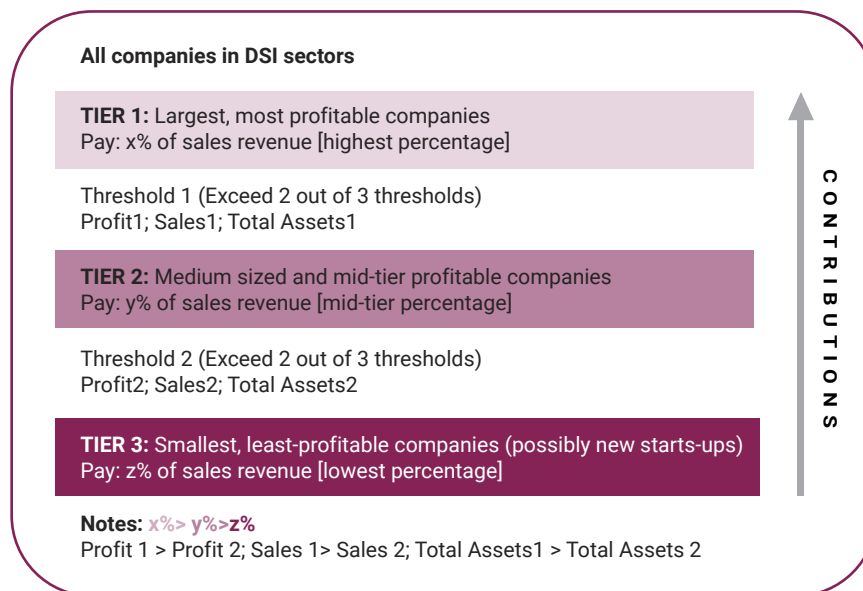
- Tier 1 will consist of the largest and most profitable firms, which will be expected to pay the highest percentage of sales (x% of sales)
- Tier 2 will consist of mid-sized, moderately profitable firms, which will be expected to pay a slightly lower percentage of sales (y% of sales) as compared to the Tier 1 firms.
- Tier 3 will consist of the smallest, least profitable firms, which will pay the lowest percentage of sales (z% of sales) as compared to Tier 1 and Tier 2 firms.

² Burgstahler and Dichev, 1997.

³ Complete data on sales and profits will be available to tax authorities. Data on sales is widely available publicly and from statistical authorities. However, the public availability of data on profits is normally more limited. For example, the preferred method in the UN System of National Accounts (SNA) to value economic output are basic prices, which reflects the amount a producer receives for a unit of a good or service, minus any taxes and plus any subsidies. A background note on the UN SNA is available [here](#).

⁴ First proposed by Kyle Vermette, Firelight Group at the LSE Roundtable on 27th September in his presentation.

Figure 2: Modelling a tiered approach with varying percentages of sales



Since the percentage of sales paid by the largest firms, i.e. Tier-1 firms (x%) is greater than that of medium-sized Tier-2 firms (y%), which in turn is greater than that paid by the smallest Tier-3 firms (z%), the tiered approach will meet the principles of fairness, while also protecting the young start-ups from being dissuaded from investing in R&D.

How do we define each tier? The cut-offs defined for each tier could be designed along similar lines to those usually used in EU regulations such as the [EU CSRD directive](#) and [EU directive on financial reporting requirements](#) of certain types of entities. Any firm that exceeds at least two out of the three criteria defined in the threshold will be considered to be in the tier above it. Two out of three criteria of profits, sales and assets gives us an optimal measure that is in keeping with the purpose of the multilateral mechanism ensuring that all relevant DSI users share their monetary benefits. A threshold system also broadens the base of contributors in a way that is fair whilst allowing for less volatility in the contributions to the global fund.

An example of thresholds based on some existing regulations, could be as follows:

1. **Large firms** shall be undertakings which on their balance sheet dates exceed at least two of the three following criteria:
 - Sales (Revenue/Net turnover): EUR 50 million
 - Profit (Net income): EUR 5 million
 - Balance sheet total: EUR 20 million
2. **Medium-sized firms** shall be undertakings which are not large firms, and which on their balance sheet dates exceed at least two of the three following criteria:
 - Sales (Revenue/Net turnover): EUR 10 million
 - Profit (Net income): EUR 1 million
 - Balance sheet total: EUR 5 million
3. **Small-firms** shall be undertakings which are not large or medium-sized firms, i.e. do not exceed the limits of at least two of the three criteria defined in point (2) above.

To help us understand the tiers better, let us consider the case of three German pharma companies: Bayer Group, Heidelberg Pharma, and Pentixaphar. Bayer is the largest of these firms with a market Cap of EUR 26.15 billion, which came into existence in 1863, but was established in its current form in 1951. Heidelberg Pharma (IPO: 2017) is medium-sized with a market cap of EUR 125.74 million, while Pentixapharm is the smallest with a market cap of EUR 84.3 million and the youngest having had its IPO just days ago on 2nd Oct 2024. Some of the financial metrics of these three firms are as shown in [Table 2](#).

Table 2: Financial metrics of three sample German pharma companies for 2022

Company	Sales (€ million)	Profit (€ million)	Total Assets (€ million)
Bayer Group	50,739	4,150	124,877
Hiedelberg Pharma	19	-20	101
Pentixapharm	1	-2	54

Source: Raw data from annual reports of Bayer, Heidelberg Pharma 2023. IPO Prospectus of Pentixapharm, 2024.

Figure 3: Modelling a tiered approach with varying percentage of sales using three sample German pharma companies

TIER 1 - pay x% of sales			
Bayer group [Exceeds all the cut-off values of sales, profit and total assets in threshold 1]	Sales = €50,739 million	Profit = €4,150	Total Assets = €124,877 million
Threshold 1 (Exceed 2 out of 3): Sales > €50 million; Profit > 5 million Euros; Total Assets > €20 million			
Hiedelberg Pharma [Exceed cut-off values of sales and total assets mentioned in threshold 2]	Sales = €18,51 million	Profit = €-19.70 million	Total Assets = €100.58 million
Threshold 2 (Exceed 2 out of 3): Sales > €10 million; Profit > 1 million Euros; Total Assets > €5 million			
Pentixapharm [Exceeds only total assets cut-off in threshold 2]	Sales = €0.05 million	Profit = €-1.96 million	Total Assets = €53.88 million
NOTE: x% > y% > z% i.e. the firms in TIER 1 pay the highest percentage of sales			

Figure 3 represents these thresholds diagrammatically along with examples of three firms which fall in each of these tiers.

- Since Bayer's sales, profits, and total assets exceed all three criteria for 'Large firms', Bayer will fall in Tier-1.
- Hiedelberg Pharma's sales and total assets exceed two of the three criteria defined for 'medium-sized' firms, hence it will fall in Tier-2.
- Since Pentixapharm only exceeded one cut-off for total assets in medium-sized firms, it cannot be classified as a medium-sized firm. It will instead be classified as a small firm, i.e. Tier 3 firm.
- Since the smallest firms (Tier-3) pay the lowest percentage of sales (z%) compared to the largest firms (Tier-3) (x%), we will be able to protect the smaller firms from having to set aside large payments, and prevent it from having negative impacts on innovation.

Furthermore, choosing a percentage of sales has the benefit of meeting the principle of 'paying nature first.' If one were to go with profits as the metric of choice, many large, successful firms may not be required to pay due to having losses in that year. As seen in **Figure 4**, out of the three firms, only Bayer will be required to pay into the fund. Heidelberg Pharma, despite being a large firm with a huge market cap, and large sales, will not be expected to pay anything to the fund. To make this easier to appreciate, the principle of paying nature first, that is as a cost of doing business, is similar to the requirement to pay for the costs of materials or for services such as utilities. Companies will pay these costs regardless of whether they are profitable or not.

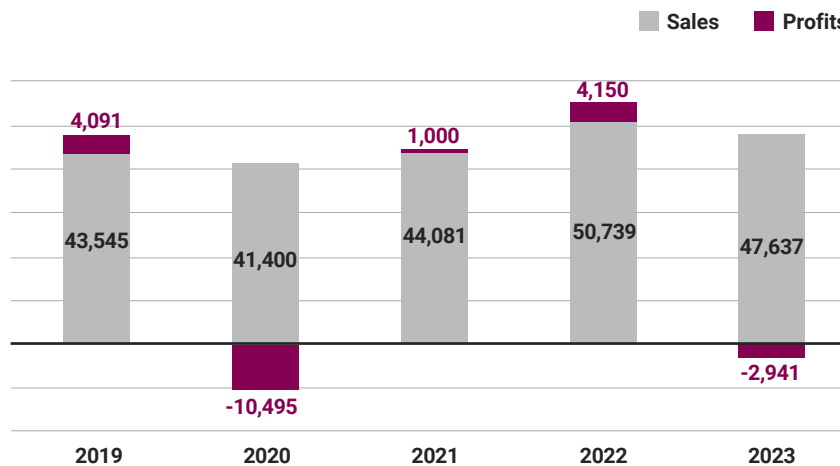
Figure 4: Modelling some examples of choosing % of profits as the metric of interest

Company	Profit (€ million) 2022 Fixed % of profit across all companies	Payment Fixed % of sales across all companies
Bayer	4,150	Pays k% of €4,150 million
Hiedleberg Pharm	-19.70	Doesn't pay
pentixapharm	-1.96	Doesn't pay

Choosing the right % of sales

Although choosing to go with a percentage of sales meets the criterion of paying nature first, one has to be careful while choosing the percentages to be paid (x%, y%, or z%). **Figure 5** shows a stacked chart of Bayer Group's profits and sales. As can be seen in the figure, profits (in burgundy) form a small proportion of sales (in grey). For example, in 2022, Bayer's profits were EUR 4,150 million, while its sales were EUR 50,739 million. Thus, profits formed only around 0.08% of sales in 2022 for Bayer group. **1% of sales for example, would translate into 12% of profits for Bayer in 2022.**

Figure 5: Stacked chart representation of profits and sales of Bayer in millions of EUR



Source: Raw data obtained from annual report of Bayer, 2023.

In conclusion, while charging a percentage of profits might initially seem like a fairer approach, especially for protecting young start-ups and fostering innovation, it presents significant challenges. Profits can fluctuate widely and be subject to manipulation, which can result in inconsistencies in contributions to the fund. Additionally, large firms experiencing temporary losses would not be required to pay, violating the principle of fairness. A sales-based charge, on the other hand, provides stability and predictability. By adopting a tiered approach, with different percentages of sales charged based on company size, this model can balance fairness with the need to support smaller firms, ensuring that all entities contribute appropriately without stifling innovation. This method also aligns with the principle of 'paying nature first,' treating contributions as a fundamental cost of doing business, regardless of profitability. However, careful consideration must be given to the percentage rates, ensuring that contributions remain fair and sustainable across different firm sizes and financial realities.



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Summaries of work presented and recordings are available here <https://oneworldanalytics.com/biodiversity-finance-dsi/presentations.html>

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