



E. European Impact

Environmental and global performance in high-tech industries – Not an oxymoron! The case of the worldwide pharmaceutical and biotech industry

ESCP Impact Paper No.2023-14-EN

Régis CŒURDEROY, Valérie DUPLAT & Duong Nguyen HUU THI THUY
ESCP Business School

Environmental and global performance in high-tech industries – Not an oxymoron! The case of the worldwide pharmaceutical and biotech industry

Régis Coeurderoy*

Valérie Duplat**

Duong Nguyen Huu Thi Thuy***

ESCP Business School

Abstract

Managerial and corporate discourses in Europe tend to claim that strict European environmental regulations lead to competitive disadvantages for European multinational enterprises (MNEs) on the global scene. Our empirical observations, however, do not support arguments establishing a negative link between the stringency of environmental regulations and global competitiveness. Using a unique dataset of the world's leading pharmaceutical and biotech firms, we observe that the MNEs able to reach a global print are those with high environmental performance in this high-tech industry. This association between corporate globalization and environmental performance is found regardless of the environmental stringency of the region or country of origin. In terms of policy implications, our observations suggest that requiring multinationals to comply with stringent environmental regulations does not harm their competitiveness and may even be a source of competitive advantage for them abroad.

Keywords: Globalization, Regionalization, MNEs, Environmental Sustainability.

*Professor, ESCP Business School

**VU Amsterdam

***PhD Student

ESCP Impact Papers are in draft form. This paper is circulated for the purposes of comment and discussion only. Hence, it does not preclude simultaneous or subsequent publication elsewhere. ESCP Impact Papers are not refereed. The form and content of papers are the responsibility of individual authors. ESCP Business School does not bear any responsibility for the views expressed in the articles. Copyright for the paper is held by the individual authors.

Environmental and global performance in high-tech industries – Not an oxymoron! The case of the worldwide pharmaceutical and biotech industry

The pharmaceutical & biotech industry – a polluting industry

Resource depletion and environmental degradation are just a few of the damages that MNEs have been blamed for in the past decade. Yet, due to their broad geographic reach and ability to access financial and non-financial resources, MNEs are also seen as playing a crucial role in addressing pressing environmental issues. In this impact paper, we focus our attention on the environmental performance of pharmaceutical and biotech companies. The main purpose of these companies should be to make people's lives healthier. There can be no healthy humans without a healthy planet, however. Given their significant contribution to global greenhouse gas (GHG) emissions, pharmaceutical, and biotech companies are increasingly attracting the attention of green activists. The healthcare industry's climatic footprint is estimated to be 4.4% of the global net emissions (Karliner, J., et. al, 2019), and if left unchecked, it will triple by 2025 (Iyer, 2022). Emissions from the pharmaceutical industry account for 20-33 % of total healthcare emissions (Risteen, 2022). By 2025, the pharmaceutical industry as a whole would need to reduce its emissions intensity by nearly 59% from 2015 levels to meet the reduction targets in the Paris Agreement (Belkhli, 2019).

Pharmaceutical and biotech businesses typically use chemicals, solvents, water, and other materials, and their complex supply chains prevent them from fully committing to environmental sustainability. Biotechnologies and other innovative technologies are often seen as the solution to sustainability problems. Improving efficiency with cutting-edge technologies could reduce waste and energy consumption, resulting in a smaller carbon footprint. In addition, biotechnologies often substitute biological activity for unnatural chemical reactions by adopting and modifying mechanisms that evolved in nature.

80% of the most cutting-edge pharmaceutical companies have committed to net-zero or carbon-neutrality goals by 2050 and many others have developed radical plans to reduce greenhouse gas emissions in the near term (CSRJournal, 2021). The question is whether global industry players have the potential to act as true agents of change or whether they instead impede progress.

Data sources

Focusing on the most innovative pharmaceutical and biotech companies, we collected extensive data on 195 companies listed in the European Scoreboard database. This database annually ranks the top 2,500 R&D spenders – not only the pharma and biotech industry – in the world and provides rich information such as R&D expenditure, R&D intensity, sales, and so on. In addition, we collected data on each company's geographic sales in 2019 in EMEA (Europe, Middle East, and Africa), the Americas, and APAC (Asia Pacific) using the Orbis database and annual reports. The division of these three regions, known as the "triad," was first proposed by Rugman & Verbeke (2004) to facilitate corporate reporting and levels of comparison related to globalization strategies. The authors classified the globalization strategies into four categories: home region – at least 50% of the firm's revenues come from the home region; host region – more than 50% of revenues come from a region other than the home region; bi-regional – at least 20% of revenues come from two regions, but less than 50% from one region; and global – at least 20% of revenues come from each region, but less

than 50% from one region (Rugman, A. M., & Verbeke, A., 2004). Information on the environmental sustainability (E-ESG) of companies is taken from the Refinitiv database.

The stringency of environmental regulations

Many countries and regions are implementing stricter regulations to protect the environment. Recently, Europe has made significant efforts to raise awareness of environmental sustainability by changing the entire accounting requirements. Firms are required to practice impact materiality reporting, which entails disclosing their environmental and societal effects and acknowledging the financial risks associated with sustainability concerns, known as impact materiality (EU, 2022). In addition, the EU has developed a unique strategic plan for the pharmaceutical industry to reduce its environmental impact and encourage the sharing of best practices (Marchal, 2020). *The EU upholds some of the strictest environmental regulations in the world* (EUR-Lex, n.d)

In the Asia-Pacific region, countries are making notable efforts to protect the environment through environmental regulations. For some dominant markets like Japan and China, the environmental protection law is continuously improved and updated (DeWit, 2020; Zhang, G., et al., 2022). Furthermore, these two countries implement international environmental standards and policy tools such as taxes and subsidies to mitigate the impact of corporate operations on the environment (Arie, 2017; OECD, 2018). India, which is the world's third-largest producer of pharmaceuticals, has been criticized for relaxing environmental assessment rules during the Covid-19 pandemic (Chandrashekhar, 2020). However, the Indian government has recently prioritized addressing climate change in its environmental policies (EconomicTimes, 2021). *In sum, in the APAC region, environmental policies vary greatly among countries.*

The United States tends to lag behind other developed countries in enforcing environmental standards, with low environmental levies relative to tax revenue and GDP (OECD, 2020). Additionally, about 64 environmental regulations were loosened under the Trump administration, and Biden is working to target or reverse only 75 % of those regulations in his tenure (Eilperin, J. et al. , 2023). Moreover, from the beginning of 2023, all publicly traded companies are required to disclose their financial data on oil and gas production use (SEC, 2022). However, there is no stand-alone system of mandatory sustainability reporting.

Global players in the pharmaceutical and biotech industry and their environmental performance

As shown in Figure 1, we observe a positive connection between globalization strategy and environmental performance for the pharma and biotech companies in our sample. MNEs with a global strategy (i.e., at least 20% of revenues from each region, but less than 50% from one region) specifically exhibit the highest levels of environmental performance, followed by MNEs with bi-region, host region, and home region strategies. The observations suggest that *environmental sustainability can be a key competitive advantage on the global scene*. Global MNEs seem to recognize the strategic importance of environmental protection.

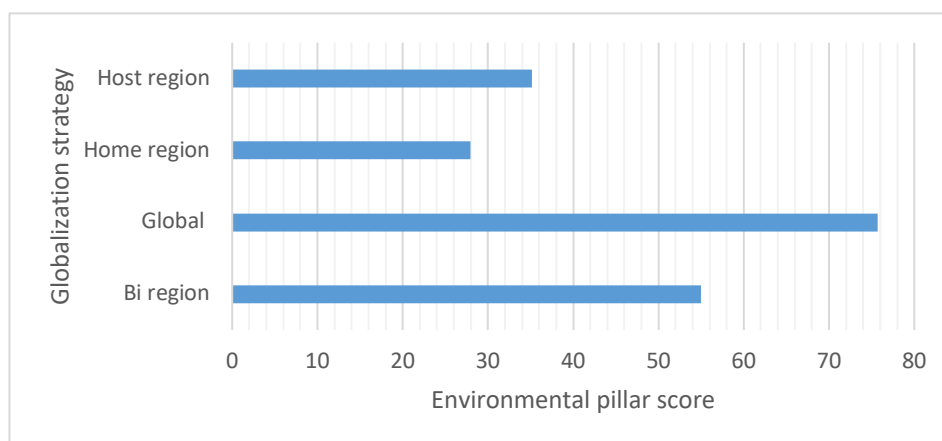


Figure 1: Globalization Strategies and corporate environmental performance

Global and environmental performance across the three regions

Figure 2 below shows that, regardless of the region of origin, pharma and biotech MNEs adhering to the globalization strategy consistently exhibit the highest levels of environmental performance compared to other MNEs with alternative strategies in the same region. Furthermore, we notice that global pharma and biotech MNEs in EMEA have higher environmental performance than those in APAC and the Americas (Figure 2). EMEA counts therefore the most sustainable global MNEs, even though this region has the fewest top R&D spenders in the industry (i.e., 42 in EMEA, 48 in APAC, and 92 in the Americas) and the most stringent environmental regulations. *So, we can say that having to cope with strict environmental standards and being globally competitive is not a paradox.* These two aspects can go hand in hand. Environmental laws and regulations serve as key incentives for MNEs to support green innovation, and by so doing they can achieve a reach. Observations suggest indeed that EU pharma and biotech companies are actively seeking to turn regulatory constraints into competitive advantages worldwide.

Region	Globalization strategy	E-ESG	Number of firms	Means of E-ESG	Total firms
APAC	Bi region	37.22	1	47.61	48
	Global	81.12	2		
	Home region	46.23	35		
	Host region	46.78	10		
Americas	Global	37.55	2	14.21	92
	Home region	17.49	82		
	Host region	3.2	8		
EMEA	Bi region	58.5	5	50.90	42
	Global	86.62	6		
	Home region	42.51	15		
	Host region	43	16		

Figure 2: Environmental performance and globalization strategies across the home regions

A closer look at the most environmentally friendly pharma and biotech MNEs in each region (the top five in Figure 3) reveals some interesting nuances, however. In particular, in the Americas, the top five companies follow a home region strategy despite their high environmental performance. It is likely that the size of the U.S. market puts less pressure on companies to venture beyond their home region. Still, these leading American pharma and biotech MNEs aim to achieve high environmental performance. Globalization is one of the most adopted strategies in the APAC and EMEA regions. It once again affirms the role of sustainability for MNEs to maintain their competitiveness in the global market. The home region is observed to be another favorite strategy of the top sustainable MNEs in these strict environmental regulation regions, as the more rigorous regulations impose more costs on

business operations. At the same time, innovation is believed to make the business run more efficiently to offset the cost incurred by strict regulation. Hence, it is interesting to investigate how innovation can foster sustainability in the top environmentally sustainable MNEs in regions with strict regulations.

Region	Companies	E-ESG	Strategy	Sector
Americas	MerckUS	78.59	Home region	Pharmaceutical
	Bristol Myers Squibb	79.39	Home region	Pharmaceutical
	Biogen	79.68	Home region	Biotechnology
	Eli Lilly	85.56	Home region	Pharmaceutical
	Johnson & Johnson	92.1	Home region	Pharmaceutical
APAC	Ono Pharmaceutical	79.98	Home region	Pharmaceutical
	Otsuka Pharmaceutical	80.05	Home region	Pharmaceutical
	Astellas Pharma	80.74	Global	Pharmaceutical
	Takeda Pharmaceutical	81.45	Global	Pharmaceutical
	Shionogi	87.2	Host region	Pharmaceutical
EMEA	Novozymes	87.9	Home_region	Biotechnology
	MerckDE	91.65	Global	Pharmaceutical
	AstraZeneca	91.72	Global	Pharmaceutical
	Ipsen	93.33	Home region	Pharmaceutical
	Roche	93.83	Host region	Pharmaceutical

Figure 3: Top 5 environmental performing pharma and biotech MNEs in each region

Looking at some key countries

The majority of U.S. companies with a home region strategy have a low environmental profile. This is justified by the fact that the Americas offer a large playing field for companies, with less stringent regulations than in the other two regions. There is less need to venture beyond the region of origin to be competitive.

In China, the dominant nation in the APAC region, top pharma, and biotech players use only the home and host region strategies. In other nations such as Japan and India, MNEs use a wider variety of globalization strategies. Interestingly, it appears from our observations that the host region and its level of environmental stringency influence how firms act. For instance, in Japan and China, multinationals that follow host region strategies have relatively high environmental scores, even exceeding those of global firms.

Multinational pharmaceutical and biotechnology companies in EMEA countries adhere to high standards of green practices. Interestingly, while Ireland and Denmark have some of the most innovative multinational pharmaceutical and biotech companies in EMEA, neither country has a "global" company, however. Most Irish and Danish companies in this sector adhere to the host region approach.

These observations raise numerous questions and require further investigation. For instance, the large adoption of the host region strategy of MNEs in some key countries such as Japan, China, Denmark, and Ireland, which are all located in strict environmental regions, opens the research question of *how the regulations in the host region comparing the home region might affect the adoption of their globalization development strategy*.

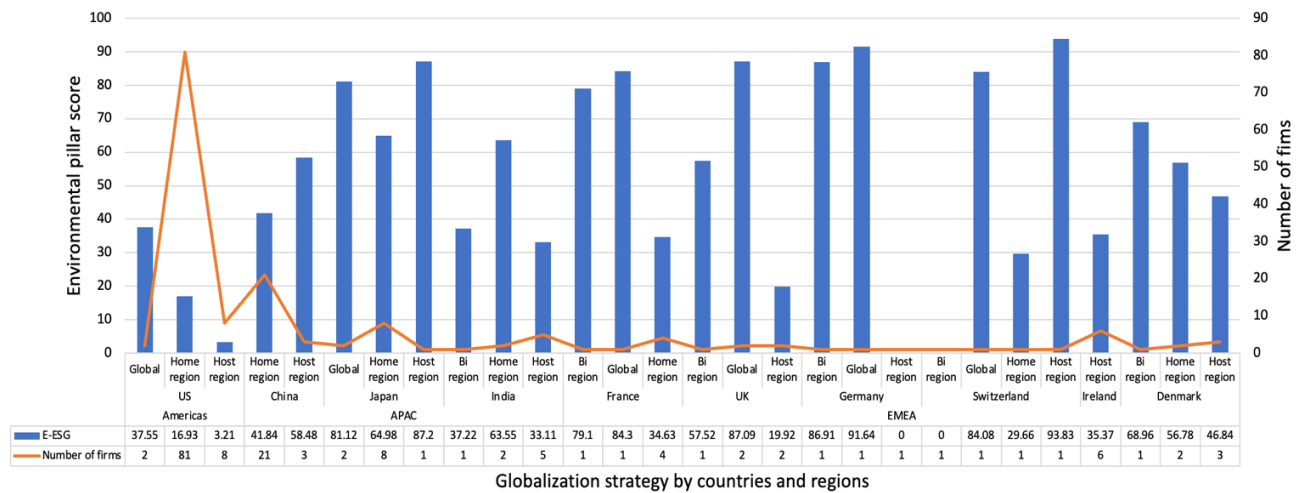


Figure 4: Environmental Performance and globalization strategies in key countries

Conclusion

Strict environmental regulations, according to widespread managerial and corporate rhetoric in Europe, could have a negative impact on the global competitiveness of European multinationals. This rhetoric is not borne out by our observations in the biotech and pharmaceutical industries. Instead, our findings tend to suggest that simultaneously applying strict environmental standards and being globally competitive is not a paradox. Environmental laws and regulations are crucial motivators for MNEs to encourage green innovation and, in doing so, maintain their worldwide competitiveness. Our paper also suggests some directions for future investigation. Firstly, it is necessary to explore how innovation might foster the sustainability of top innovative and sustainable MNEs in high environmental stringency regions. Secondly, our findings about the impact of the host region's environmental regulations compared to the home one on businesses' adoption of MNEs' globalization development strategy leave room for further investigation.

References

- Arie H. (2017), ISO 14001 *Environmental Management System Standard Trends in Japan*. Japan Industry News: <https://www.japanindustrynews.com/2017/04/iso-14001-environmental-management-system-standard-trends-japan/>
- Belkhli L. (2019), *Big Pharma emits more greenhouse gases than the automotive industry*. Retrieved from McMaster University: <https://brighterworld.mcmaster.ca/articles/big-pharma-emits-more-greenhouse-gases-than-the-automotive-industry/>
- Chandrashekhkar V, (2020), *India's push to relax environmental assessment rules amid pandemic draws criticism*. Science: <https://www.science.org/content/article/india-s-push-relax-environmental-assessment-rules-amid-pandemic-draws-criticism>
- CSRJournal, (2021), CSR Journal, *What is Big Pharma doing to tackle Climate Change?:* <https://thecsrjournal.in/big-pharma-companies-climate-change-environment/>
- DeWit A. (2020), Is Japan a Climate Leader? Synergistic Integration of the 2030 Agenda, *The Asia Pacific Journal*, 18(3).
- Economictimes, (2021), *India put climate change at the centre of its environmental policies in 2021*, <https://economictimes.indiatimes.com//news/india/india-put-climate->

change-at-the-centre-of-its-environmental-policies-in-2021/articleshow/88542444.cms?utm_source=c.

Eilperin J, Dennis B, Muyskens J, (2023), *Tracking Biden's environmental actions*, The Washington Post: <https://www.washingtonpost.com/graphics/2021/climate-environment/biden-climate-environment-actions/>

EU, (2022), *Sustainable finance*. Retrieved from European Commission : <https://ec.europa.eu/newsroom/fisma/items/754701/en>

EUR-Lex, (n.d), Summaries of EU legislation, Retrieved fromEuro-lex: <https://eur-lex.europa.eu/content/summaries/summary-20-expanded-content.html>

Iyer J. K, (2022). *6 ways the pharmaceutical industry can reduce its climate impact*. Retrieved from World Economic Forum: <https://www.weforum.org/agenda/2022/11/pharmaceutical-industry-reduce-climate-impact/#:~:text=While%20it%20may%20not%20get,by%202050%20if%20left%20unchecked>

Karliner J, et. al. (2019), HEALTH CARE'S CLIMATE FOOTPRINT. ARUP.

Marchal A, (2020), *European Pharmaceutical Industry Statement on the Update on the Progress and Implementation of the EU Strategic Approach to Pharmaceuticals in the Environment*. Retrieved from AESGP: <https://aesgp.eu/articles/joint-statement-of-european-pharmaceutical-industry-associations-on-the-update-on-the-progress-and-implementation-of-the-eu-strategic-approach-to-pharmaceuticals-in-the-environment>

OECD, (2018), *China's Progress Towards Green Growth: an international perspective*. OECD Green Growth Papers.

OECD, (2020), *Environmental taxation*, <https://www.oecd.org/environment/tools-evaluation/environmentaltaxation.htm>

Risteen B, (2022), *It's Time to Calculate the Carbon Footprint of Pharmaceutical Products*, The Medicine Maker: <https://themedicinemaker.com/manufacture/its-time-to-calculate-the-carbon-footprint-of-pharmaceutical-products>

Rugman A M, & Verbeke A, (2004), A perspective on regional and global strategies of multinational enterprises. *Journal of international business studies*, 31(1), 3-18.

SEC, (2022), *SEC Proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors*, <https://www.sec.gov/news/press-release/2022-46>

Zhang G., et al, (2022), *China's environmental policy intensity for 1978–2019*. Scientific data, 9(1), 75.