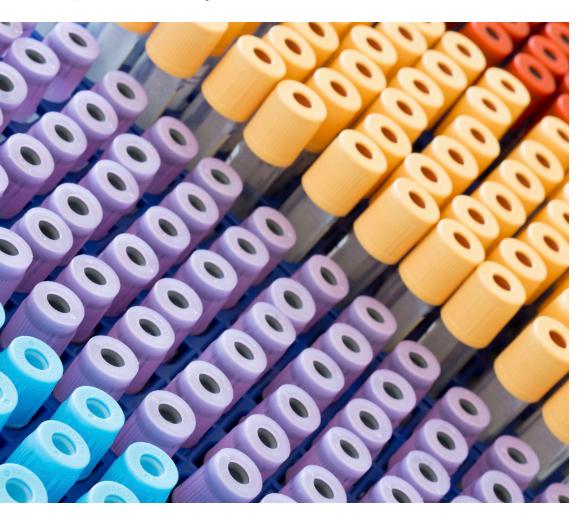
ESG Materiality Map

Pharmaceuticals

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Social factors, such as access and affordability, customer health and safety, and responsible marketing, are more material than environmental factors. Pollution is an example of a material environmental factor.

This report does not constitute a rating action



Sustainable Finance

Thomas Englerth New York thomas.englerth @spglobal.com

Michael Ferguson

New York michael.ferguson @spglobal.com

Credit Ratings

Tulip Lim

New York tulip.lim @spglobal.com

David Kaplan

New York david.a.kaplan @spglobal.com

Contributors

Lai Ly

Paris lai.ly @spglobal.com

Pierre Georges

pierre.georges @spglobal.com

ESG Materiality Map Pharmaceuticals

In line with the research report "Materiality Mapping: Providing Insights Into The Relative Materiality Of ESG Factors," published on May 18, 2022, S&P Global Ratings is publishing research on the ESG materiality map for the pharmaceuticals sector. We provide an illustration of our current view of the relative materiality of certain environmental and social (E&S) factors, from both the stakeholder and credit perspectives, for the sector. The materiality map does not represent any new analytical approach to the treatment of E&S factors in our credit ratings. See our ESG criteria for more information on how we incorporate the impact of ESG credit factors into our credit ratings analysis.

Pharmaceuticals Sector

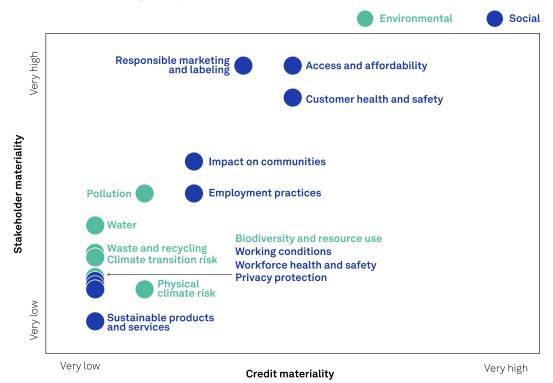
The pharmaceuticals sector includes companies that develop, manufacture, and commercialize branded, over-the-counter, and generic drugs.

Key Takeaways

- Access and affordability is highly material for stakeholders because medicines are
 essential to maintaining human health. Lawmakers and payors could try to reduce the
 cost of drugs, but that would have a negative credit impact on pharmaceutical
 companies..
- Customer health and safety and responsible marketing and labeling are also highly
 material factors for stakeholders, yet currently are less material for credit. The use of
 medicines can have harmful effects, but credit implications of these events are more
 likely to be drug-specific, not sector-specific.
- Environmental factors are generally less material than social factors in this industry.
 However, the manufacture, use, and disposal of pharmaceutical products can contribute to environmental pollution, but we believe credit impact to be relatively low.

See materiality map on the following page.

ESG Materiality Map For The Pharmaceuticals Sector



The materiality map provides an illustration at a point in time, of our findings on the relative materiality of certain environmental and social (E&S) factors, from both the stakeholder and credit perspectives, for the sector. It does not represent any new analytical approach to the treatment of E&S factors in our credit ratings. See our ESG Criteria for more information on how we incorporate the impact of ESG credit factors into our credit ratings analysis. Source: S&P Global Ratings.

How To Read The ESG Materiality Map

The stakeholder materiality (Y axis) reflects our assessment of the relative level of impacts and dependencies of the sector on the environment, society, and economy.

The credit materiality (X axis) reflects our assessment of the relative level of potential and actual credit impact for the sector. The credit implications for the factors positioned on the left side to the middle of the X-axis would be more limited and absorbable. On the right side, there is higher potential for these implications to be more disruptive. We assess credit implications for an entity based on its individual characteristics.

Assessing E&S factors' materiality: We consider both the likelihood of the impact from a given factor, as well as the magnitude of the impact. The materiality of the factors varies depending on the perspective (stakeholder or credit) as well as the evolving and dynamic interactions between these two dimensions.

The main areas of the map:

- The upper-right quadrant displays the most material, on a relative basis, E&S factors identified for the sector from both a stakeholder and credit perspective.
- The upper-left quadrant presents factors that are more material from a stakeholder than credit perspective. These factors have the potential to become more material from a credit perspective.
- The bottom-left quadrant shows factors that are less material for both stakeholders and credit. Their materiality may evolve over time and this dynamic may not be linear.

Examples Of Material Factors

Below we provide the rationale of some of the material factors to illustrate the above findings.

Access and affordability

Access and affordability is a highly material social factor for stakeholders in the pharmaceutical sector because access to medication is critical to human wellbeing and a stable, civil society. The magnitude of materiality varies widely from country to country, with local insurance/payor system, wealth and income disparity, and the presence of systemic inequities playing a large part. Many drugs are not available to people living in developing countries. While many countries have systems in place that significantly reduce or eliminate out-of-pocket costs to patients, there are still many countries where access and affordability remains a meaningful issue because out-of-pocket drug expenses remain high relative to disposable income. Drug affordability is important to the public and therefore is generally highly regulated or remains a high-priority social issue for some lawmakers and regulators. For example, increased public scrutiny of drug prices in the U.S., where profitability is often highest, could have a credit impact in the sector. Yet we expect any potential drug pricing reform would not involve widespread, severe cuts to drug prices because we believe U.S. lawmakers also want to encourage continued investment in research and development (R&D).

Customer health and safety

Customer health and safety is also a highly material factor for the sector for both stakeholders and credit. The impacts associated with drug safety and efficacy are borne by a wide variety of stakeholders, starting with the patients themselves. Outcomes of poor efficacy, low quality, and unsafe administration, dosage, or side effects can result in the death, injury, as well as permanent and rapid declines in health and quality of life for the patient. Mismanagement of clinical trial participants, including vulnerable populations, could also lead to irremediable consequences and damage a company's reputation. Regulatory oversight limits the incidence of safety events. In most markets, companies must demonstrate that new medicines work as intended and their benefits outweigh safety risks before approval, a process that can take years and eliminates many drug prospects. Companies with a track record of meeting these hurdles and producing market-leading drugs are generally considered stronger businesses from a credit perspective. The materiality of customer health and safety is lower for credit than for stakeholders because when safety issues emerge, they tend to be drug- or company-specific. They can have credit implications at the entity-level, depending on the situation, but are rarely systematic, limiting materiality to the sector.

Responsible marketing and labeling

The responsible marketing and labelling of pharmaceutical products is a highly material factor for stakeholders, albeit less for credit. There have been cases in the sector of marketing off-label use (application of a pharmaceutical product outside the scope of use approved by the applicable drug administration authorities) or unlawful drug promotion. For patients, a drug overuse or misuse can cause injury or in some cases, death, which weighs on stakeholder materiality. For doctors, prescribing incorrect medicine due to misinformation by the pharmaceutical companies can have implications for their reputation or result in lawsuits. If these practices happen at scale, they can have a large impact on patients and the public at large. The magnitude of a credit impact from a lapse in responsible marketing practices could be high,

but the likelihood of an infraction or violation is mitigated by highly developed regulation and enforcement globally. With some exceptions, including the U.S. and New Zealand, the marketing of prescription drugs directly to consumers is generally prohibited, though we note that the U.S. is the largest market for pharmaceuticals globally.

Impact on communities

The pharmaceutical sector has both positive and negative potential impacts on communities and is highly material for these stakeholders and less so for credit. Approved products when prescribed and used properly can have positive effects on human health and therefore can affect the functioning of the broader community. Issues surrounding access and affordability of drugs, responsible marketing of medicines, and customer and health and safety of pharmaceutical products can have impacts that go beyond the patient and affect the community at large. In addition, medicines can at times have harmful effects, which can result in injury, death, or addiction. Drugs that are addictive could put pressures on a community, causing increases in crime and the need for social services, law enforcement, and health care services. Regulations and monitoring related to the approval, marketing, and supply of pharmaceutical products reduce the occurrence of these events. Therefore, we expect the credit impact of such events on the industry overall to remain relatively low. The impacts would fall more to individual companies or products, rather than be pervasive throughout the industry.

Pollution

Pollution caused by pharmaceutical products is a relatively material factor for stakeholders, but somewhat less so for credit. The manufacturing of pharmaceutical products and the cleaning phase involve hazardous chemical products that can contaminate the premises and harm the health of surrounding communities. The leaching of active pharmaceutical ingredients into the natural environment across the sector's value chain, especially from the manufacturing phase to the use and disposal phases can negatively affect ecosystems. For example, the presence of compounds from oral contraceptives, psychiatric drugs, and excessive antibiotics in wastewater and soil have affected wildlife or are a direct threat to the human population. There has been regulation limiting antibiotic use, particularly in pharmaceuticals for animal use, but overall, efforts to reduce pharmaceutical contamination in the environment have not affected credit for the overall sector, and we expect the potential costs from increased regulation and remediation to be modest for manufacturers.

What is our approach to research on the ESG materiality map?

Referring to the research report "Materiality Mapping: Providing Insights Into The Relative Materiality Of ESG Factors," published on May 18, 2022, this research is built on the ESG materiality concept that considers ESG issues as material when they could affect stakeholders, potentially leading to material direct or indirect credit impact on entities. It considers that all businesses, through their activities and interactions, impact and depend, directly or indirectly, on stakeholders such as the environment (natural capital), society (human and social capital), and economy (financial capital). Using this ESG materiality concept, S&P Global Ratings has worked toward identifying a common, global, cross-sector set of E&S factors that we believe are material to stakeholders, and either are already, or have the potential to become, credit material for entities. The materiality map we propose provides an illustration at a point in time, of our findings on the relative materiality of those factors, from both the stakeholder and credit perspectives.

How does the sector ESG materiality map relate to credit ratings or ESG evaluations?

The sector materiality map is a visual representation of the factors that we consider impactful to the sector from a stakeholder and credit perspective for the purposes of this research. It does not represent any new analytical approach to the E&S factors in our credit ratings.

The relative materiality of the factors indicated on the materiality maps may inform the E&S Risk Atlas scores and the weights of the E&S factors used in ESG evaluations.

They may also inform our discussions with issuers on those factors' existing or potential credit materiality.

Related Research

- Materiality Mapping: Providing Insights Into The Relative Materiality Of ESG Factors, May 18, 2022
- Environmental, Social, And Governance Principles In Credit Ratings, Oct. 10, 2021
- ESG Evaluation Analytical Approach, Sept. 20, 2022



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