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ESG – Global

Heat map: Social considerations pose high credit risk for 14 sectors, $8 trillion debt

Emerging market sovereigns, pharmaceuticals and automotive manufacturers are among the largest sectors facing high social credit risk. Social considerations pose "high risk" to the credit quality of 14 sectors with roughly $8 trillion in rated debt. These findings are based on our review of 82 global sectors with total rated debt of about $78 trillion on a four-point scale of "very high risk", "high risk", "moderate risk" and "low risk". No sectors fall into the "very high risk" category. High-risk sectors can be broadly grouped into four categories: emerging market (EM) governments; healthcare and education sectors; heavy industries reshaped by environmental and social forces; and consumer sectors at risk of socially driven regulatory tightening.

Social exposures are more pervasive for our rated sectors than environmental exposures. In comparison, the credit quality of 11 sectors with around $2 trillion in debt faces elevated environmental risks. Moreover, 49 sectors with $63 trillion in debt have "very high" or "high" inherent exposure to at least one social issue, compared to only 26 sectors (roughly $12 trillion in debt) with equivalent environmental exposures. The credit impact of social exposures can be mitigated for most sectors, for instance via effective compliance with regulations. However, the breadth of social exposures across sectors reflects their relevance to our analysis. Cyber risks are typically also far-reaching, with 13 sectors ($20.5 trillion in debt) exhibiting elevated exposure to cybersecurity risks.

Exposure to demographic and societal trends is particularly widespread. Twenty-eight sectors ($8 trillion in debt) face "very high" or "high" exposure in this category, including susceptibility to aging demographics, shifting generational values, fair pricing concerns and socially driven campaigns. Sixteen sectors ($18 trillion in debt) are highly exposed to customer relations issues, notably the handling of data security and customer privacy, while 20 sectors ($7 trillion in debt) are highly exposed to responsible production concerns, such as product recalls and responsible sourcing. Health and safety issues are prominent in 13 sectors ($4 trillion in debt). Finally, 10 sectors (over $3 trillion in debt) are highly exposed to human capital issues due to their highly unionized nature and/or reliance on specialized labor.

Credit implications of social risks are more pronounced for emerging market governments than advanced economy peers. Access to essential services, income inequality, education levels and crime rates often influence credit quality for central, regional and local governments in emerging markets. While demographic trends pose the main social challenge for governments in advanced economies, these governments typically operate in larger, more diverse economies than their EM counterparts, which can provide economic and fiscal flexibility to mitigate social risks.

EM sovereigns, pharmaceuticals and automotive manufacturers are among the largest sectors facing high social credit risk

Social considerations represent the broadest element of environmental, social and governance (ESG) analysis, and their importance to credit quality can be complex, multifaceted and varied. Based on our analysis of 82 global sectors with total rated debt of about $77.7 trillion, social considerations pose "high risk" to the credit quality of 14 sectors with $8.3 trillion in rated debt.

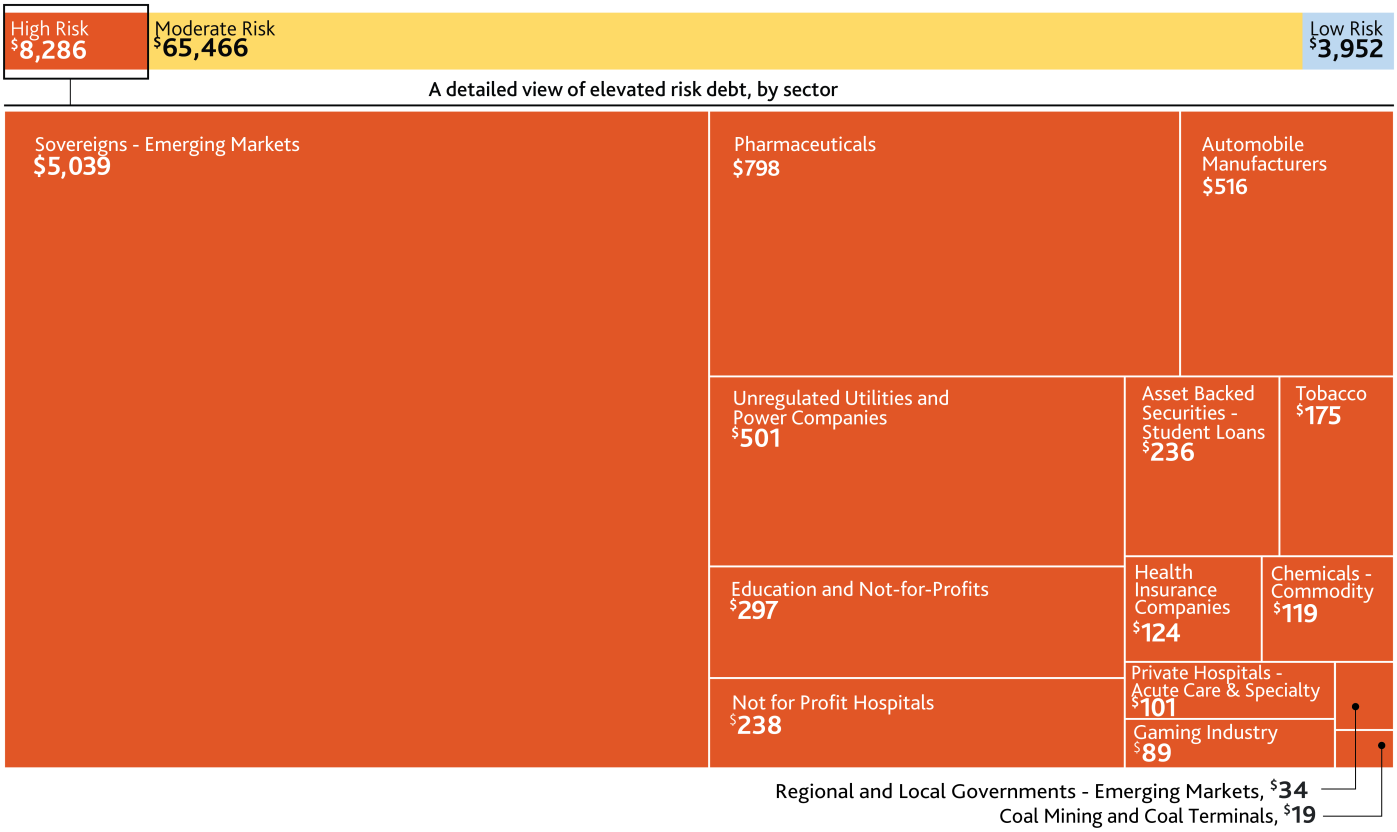
We have created a heat map to illustrate the relative credit materiality of social considerations to individual sectors, using a four-point scoring scale of "very high risk", "high risk", "moderate risk" and "low risk". Our heat map does not capture the relative exposure of all issuers within a given sector (or subsector), nor does it capture regional deviations within a sector. Still, it serves as a consistent starting point for a more granular evaluation of social considerations at an entity level. As shown in Exhibit 1, we do not deem any sectors to be at "very high" risk from social considerations, the highest overall category score in our heat map framework (see page 4).

Exhibit 1

Fourteen sectors with $8.3 trillion in rated debt face high credit risk from social considerations

"High risk" sectors in our social risk heat map sized relative to value of rated debt ($ billion)

KEY: High Risk Moderate Risk Low Risk



Source: Moody's Investors Service

Sectors whose credit quality face "high risk" from social considerations can be grouped into four broad categories:

» **Emerging market (EM) sovereigns and regional and local governments**. Social considerations pose a high risk to the credit profiles of EM sovereigns ($5 trillion of rated debt) and regional and local governments (RLGs, $34 billion). Issues such as income inequality, access to essential services, and violence and crime can all be significant credit challenges across developing markets. For example, increasing violence in Mexico presents credit risks to a significant number of RLGs, particularly municipalities exposed to sensitive industries like tourism (see Regional & Local Governments – Mexico: Spreading violence exposes more states and municipalities to security related credit risks, 5 March 2019).

» **Healthcare and education-related sectors.** This large cluster of sectors includes pharmaceuticals ($798 billion), education and not-for-profits ($297 billion), not-for-profit hospitals ($238 billion), student loan asset-backed securities ($236 billion) health insurance companies ($124 billion), and acute care and specialty private hospitals ($101 billion). The immense societal importance of healthcare and education means that these sectors tend to be extremely sensitive to demographic and societal pressures, including access and affordability. As a consequence, they are typically heavily regulated and exposed to shifting political and legislative agendas. For example, high and rising end-user costs are subjecting the pharmaceutical industry to far-reaching regulatory oversight and related efforts to reduce drug expenditures, which may dampen the industry's long-term growth prospects.

» **Heavy industries that are being reshaped by environmental and social forces.** This segment comprises automotive manufacturers ($516 billion), unregulated utilities and power companies ($501 billion), commodity chemicals ($119 billion), and coal mining and coal terminals ($19 billion). The growing interplay between environmental and social forces will have a transformative impact on the credit quality of these sectors, and will likely translate into balance sheet and/or business model realignment for industry players. For example, as a result of stricter fuel efficiency standards and expectations of a gradual change in consumer preferences, the automotive sector is undergoing a fundamental shift away from traditional combustion-engine vehicles toward electrified powertrains and self-driving technologies. Commodity chemicals companies are susceptible to softer demand for single-use plastics due to rising social pressure amid concerns over environmental and ecological damage.

» **Consumer-oriented sectors at risk of socially driven regulatory tightening**. Tobacco ($175 billion) and gaming companies ($89 billion) make up the final group of "high risk" sectors. For these sectors, the credit effects of socially driven regulatory action are exacerbated by expanding consumer activism and media scrutiny over the perceived hazards of certain products and services. For example, industry regulation of the tobacco industry and heightened social awareness of the perils of smoking have had an adverse impact on sales of traditional tobacco products, forcing companies to invest in alternative products. Evolving regulation will also likely weigh on new product lines, such as e-cigarettes (See Tobacco - US: FDA plan to ban menthol cigarettes, restrict flavoured e-cigarette sales is credit negative, 21 November 2018).

In these sectors, credit pressures from social considerations are present and visible, or are likely to emerge in the future, for a broad set of issuers. There is typically some scope for issuers to manage risks. For example, they can adjust their business models, change policies (in the case of governments), or pass on expected cost increases to customers or taxpayers. Overall, however, social considerations will remain a material credit driver for these sectors for the foreseeable future.

Credit-relevant social considerations differ significantly between public and private sectors (including business-like governmental entities such as municipal utilities and mass transit enterprises) and are consequently defined differently within our heat map, as we illustrate in Appendix A.

Our heat map assesses the inherent exposure of governmental issuers to six social risk subcategories: demographics, labor and income, education, housing, health and safety, and access to basic services (see Cross-sector: Social issues have multiple impacts on government credit quality, 28 November 2018).

For private-sector issuers, our heat map assesses inherent exposure to five social risk subcategories: customer relations, human capital, health and safety, responsible production, and demographic and societal trends (see Cross-Sector - Global: Social issues can be material to private issuers' credit quality but are not typically the primary driver, 20 February 2019).

Assessing sector exposure to social risks: our approach

Our social risk heat map was developed by Moody's analytical teams and reviewed independently by our Credit Strategy and Standards and Environmental, Social and Governance groups. The review took place on a globally coordinated basis from April to August 2019.

We surveyed analysts on the credit materiality of social risks to their respective sectors. Sector classifications are based on our rating methodologies and reflect only Moody's rated entities within a given sector. First, the analysts assessed each sector's inherent (unmitigated) exposure to different categories of social risk and assigned a category score of "very high," "high," "moderate" or "low" to describe the sector's exposure to each risk category.

The analysts provided a qualitative assessment of the overall credit materiality of social risks for each sector globally. In this context, we regard social risks as material if they result in visible pressure on the credit profiles of a broad set of issuers, either today or in the foreseeable future. In assigning a score, our analysts considered a sector's exposure to social risks in their totality, as well as industry-wide mitigants to these risks. Finally, we assigned an overall social risk score to each sector: "very high risk," "high risk," "moderate risk" or "low risk" (see Exhibit 2).

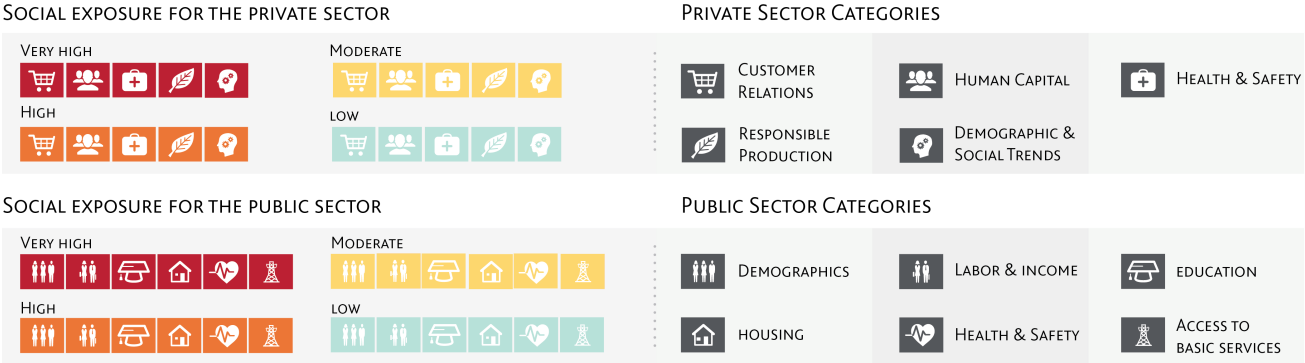
Exhibit 2

Our social risk scoring definitions

Overall Sector Social Risk Scoring

Our overall scores provide a qualitative assessment of the credit materiality of social risks for 82 sectors globally. In this context, we regard social risks as material if they result in visible pressure on the credit profiles of a broad set of issuers, either today or in the foreseeable future. In assigning a score, we consider a sector's exposure to social risks in their totality, as well as sector-wide mitigants to these risks.

Very High Risk	For sectors scored red overall, the credit materiality of social risks is considered "very high risk". As such, material pressures from social risks are visible for issuers' credit profiles currently, or there is a very high likelihood that these will crystallize in the future. There is also limited scope for most issuers to adjust to or manage these risks in the near term without major structural, financial and/or policy realignment.
High Risk	For sectors scored orange overall, the credit materiality of social risks is considered "high risk". As such, credit pressures from social risks are present, or are likely to crystallize in the future, but are less influential for issuers' credit profiles compared to sectors scored red. There is also typically greater scope for issuers to adjust to or manage social risks; for example, by adapting business models, changing policies (in the case of governments), or by passing on expected cost increases to customers or taxpayers.
Moderate Risk	For sectors scored yellow overall, the credit materiality of social risks is considered "moderate risk". As such, credit pressures from social risks are less pronounced, or are less likely to develop in a way that is influential in the future compared to sectors scored orange. Sectors have inherent exposure to one or more social risks, but there is a reasonable expectation that most issuers can adapt to or manage these risks over the medium term in a way that substantially mitigates the overall impact on credit quality.
Low Risk	For sectors scored green overall, the credit materiality of social risks is considered "low risk". As such, there is little pressure on issuers' credit profiles currently, and a low likelihood that they will manifest in the future. Low risk sectors may have some exposure to one or more social risks, but there is significant scope to adjust to or manage these risks. Remediation is generally routine, costs can easily be passed along to customers or taxpayers, and/or regulations are unlikely to become meaningfully stricter over the foreseeable future.



Source: Moody's Investors Service

The debt amounts reported in this publication represent the total face amount of debt publicly rated by Moody's in each sector as of May 2019. They include amounts for both long-term obligations and commercial paper. We allocate debt instruments to sectors on the basis of the primary methodology/methodologies used in the rating process. For debt rated under multiple methodologies that fall within different sectors, we evenly distribute the face amount to each sector accordingly.

Social considerations pose "moderate risk" to the credit quality of the vast majority of sectors

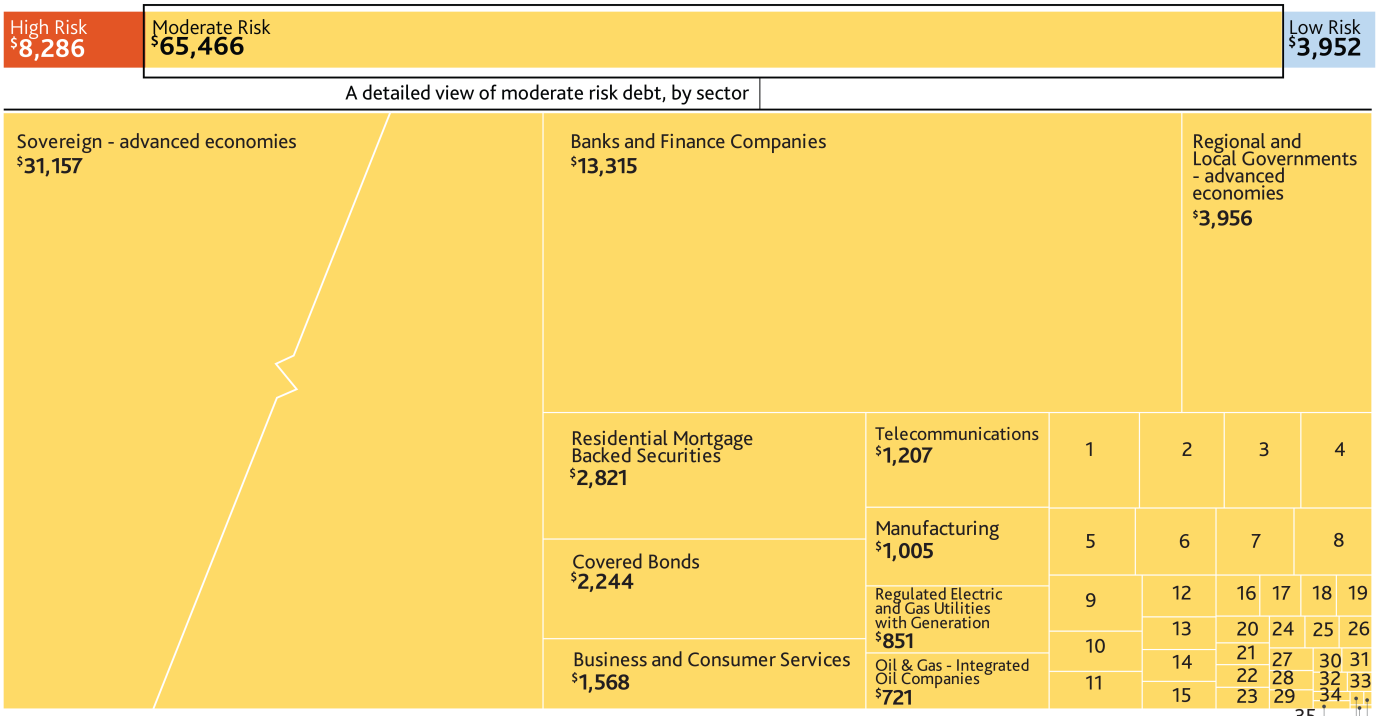
In addition to 14 "high risk" sectors, we identify 48 sectors, with $65.5 trillion in rated debt (84% of the total), whose credit quality is at "moderate risk" from social issues (see Exhibit 3). Compared to high-risk sectors, credit pressures from social risks are less pronounced, or are less likely to develop in a way that will affect credit quality. The three largest sectors by total debt outstanding with "moderate risk" exposure are advanced economy sovereigns ($31.2 trillion of rated debt), banks and finance companies ($13.3 trillion), and advanced economy RLGs ($4.0 trillion).

Exhibit 3

Social considerations pose a "moderate risk" to credit quality of most sectors

"Moderate risk" sectors in our social risk heat map sized relative to value of rated debt ($ billion)

KEY: High Risk Moderate Risk Low Risk



1. Retail and Apparel, $591
2. Consumer Goods, $557
3. Media & Broadcasting, $506
4. Regulated Electric and Gas Networks/Utilities with no Generation, $467
5. Chemicals - Specialty, $399
6. Life Insurance, $379
7. Beverage Industry, $367
8. Oil & Gas - Independent Exploration & Production, $364
9. Oil & Gas - Midstream Energy, $358
10. Mining - Metals and Other Materials, excluding Coal, $255
11. Medical Products and Devices, $242
12. Property, Casualty and Reinsurance, $217
13. Mass Transit, $167
14. Public Sector Housing, $166
15. Oil & Gas - Oilfield Services, $145
16. Pension Funds, $125
17. Automotive Suppliers, $114
18. Packaging Manufacturers: Metal, Glass, and Plastics, $104
19. Restaurants, $101
20. Building Materials, $94
21. Passenger Railways, $81
22. Asset Backed Securities - Small and Medium Enterprises, $80
23. Steel, $79
24. Oil & Gas - Refining & Marketing, $78
25. Airlines, $74
26. Paper and Forest Products, $73
27. Asset Managers, $68
28. Environmental Services and Waste Management, $60
29. Protein and Agriculture, $59
30. Asset Backed Securities - Personal Loans, $50
31. Construction, $50
32. Power Generation Projects, $47
33. Ports, $32
34. Publishing, $24
35. Shipping, $22
36. Asset Backed Securities - Tobacco Settlement, $12
37. Asset Backed Securities - Aircraft, $8
38. Collateralized Debt and Loan Obligations - Project Finance and Infrastructure Assets, $6

Source: Moody's Investors Service

Moderate-risk sectors have inherent exposure to one or more social risks, but there is a reasonable expectation that most issuers can adapt to or manage these risks in a way that substantially mitigates the overall impact on credit quality. For example, while many extractive industries may have very high exposure to health and safety incidents given the nature of their core business, risk management practices and compliance with regulations can help manage such exposures. Additionally, given the slow-moving nature of many social issues, such as demographic change, many companies have the financial flexibility to adapt and integrate changes in customer preferences or social policy agendas into their business models as visibility into these trends improves.

The creditworthiness of 20 sectors with $4 trillion in rated debt is at low risk from social considerations

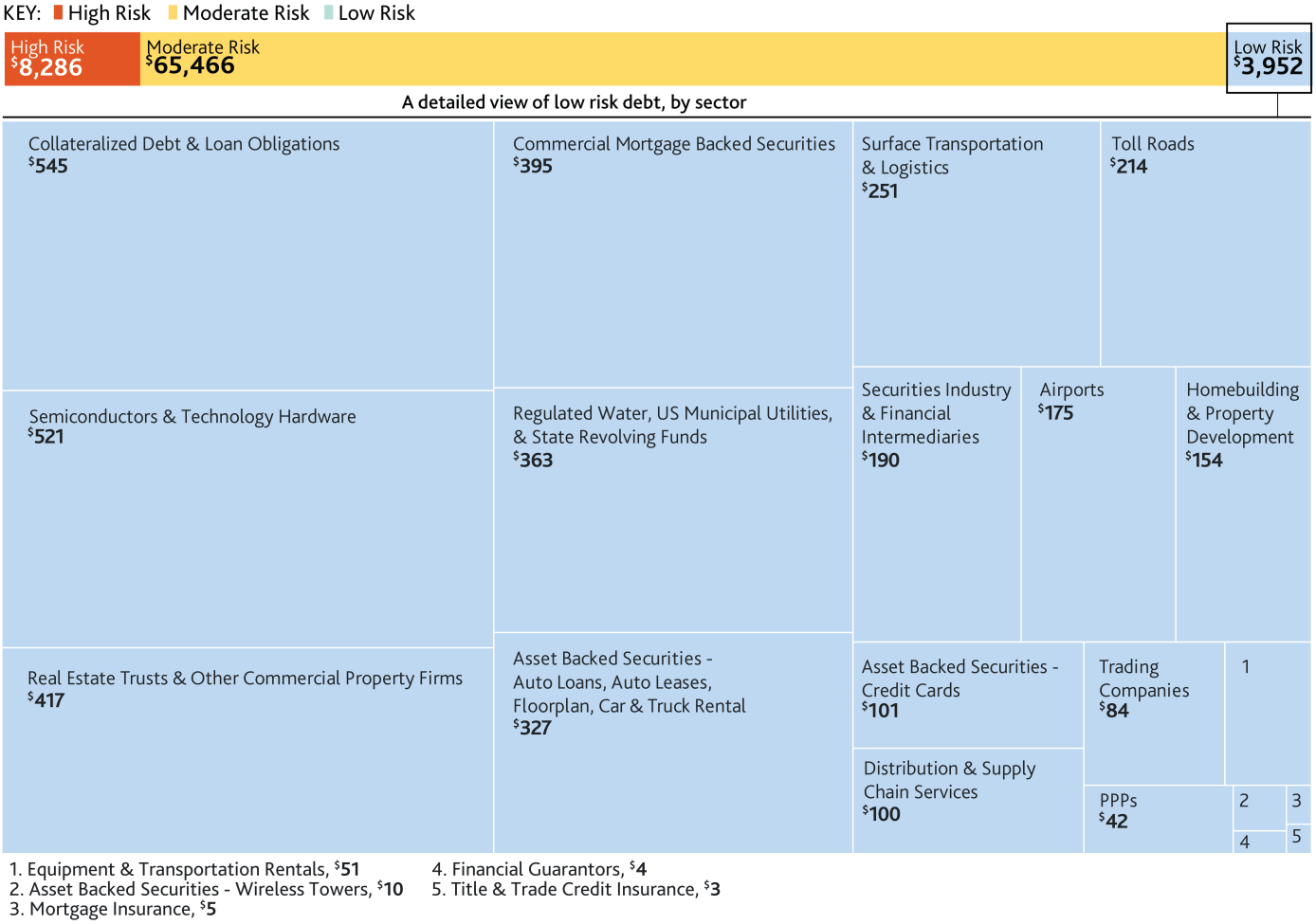
For the remaining 20 sectors, representing $4 trillion in rated debt, the overall credit exposure to social risks is low (see Exhibit 4). These sectors include collateralized debt and loan obligations ($545 billion), semiconductors and technology hardware ($521 billion), and real estate trusts and other commercial property firms ($417 billion).

Exhibit 4

Twenty sectors representing $4 trillion in rated debt score "low risk"

"Low risk" sectors in our social risk heat map sized relative to value of rated debt ($ billion)

KEY: High Risk Moderate Risk Low Risk



1. Equipment & Transportation Rentals, $51
2. Asset Backed Securities - Wireless Towers, $10
3. Mortgage Insurance, $5
4. Financial Guarantors, $4
5. Title & Trade Credit Insurance, $3

Source: Moody's Investors Service

Sectors with low social risk typically exhibit at least one of the following characteristics.

First, some sectors are positioned to benefit from demographic changes and/or societal trends. While demographic shifts can hurt an issuer's core business operations, they can also create new growth opportunities for certain sectors. For instance, population growth, urbanization and housing affordability are important factors driving demand for property developers.

Second, sectors with limited direct exposure to consumers tend to carry lower risk overall. Sectors in which issuers are typically intermediaries that conduct most of their activities via business-to-business transactions, such as trading companies and many structured finance sectors, are typically exposed to lower social risk.

Finally, sectors that are not labor-intensive are generally more insulated from a credit perspective. Industries that are less reliant on labor, such as toll roads, are generally less exposed to social issues relating to human capital (such as unionization) and health and safety (e.g., workplace accidents).

Social exposures are more pervasive for our rated sectors than environmental exposures

Comparing sector exposures to environmental, social and cyber risks

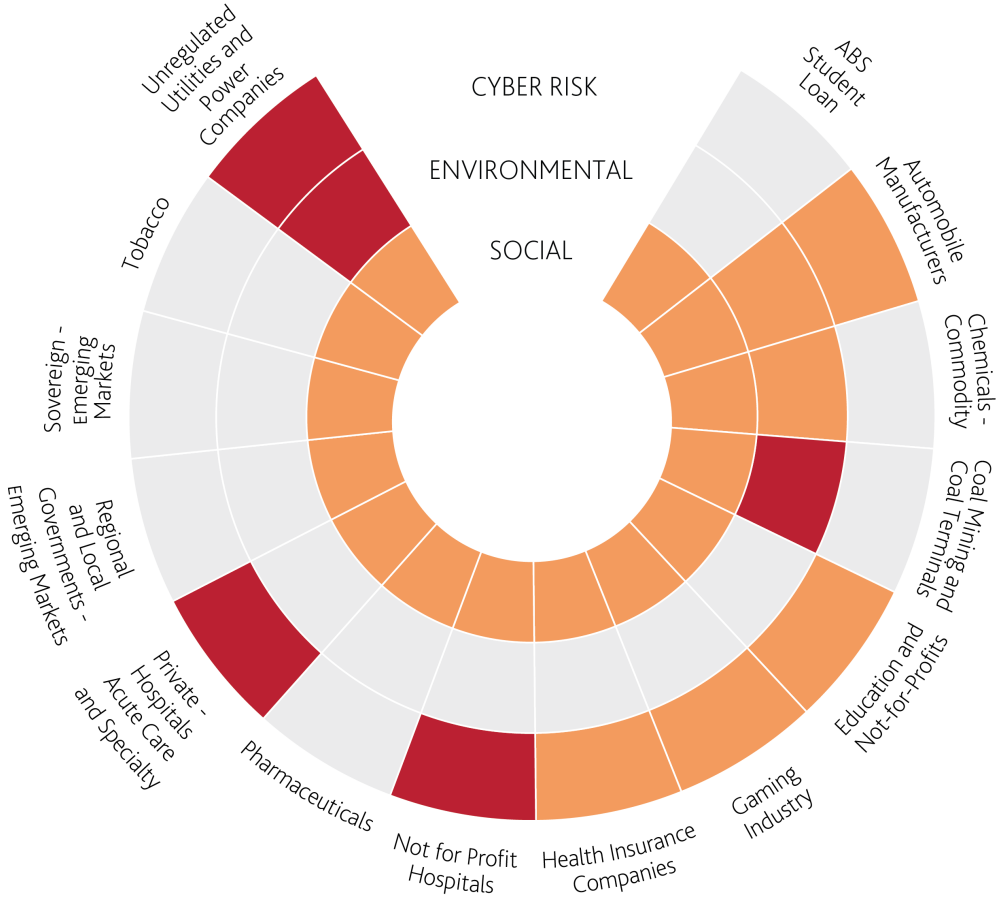
One of our interesting findings from the social risks heat map is that the inherent exposure of globally rated sectors to social considerations tends to be more widespread than exposure to environmental issues. Indeed, 49 sectors in our social risks heat map, representing $63.1 trillion in rated debt, have "very high" or "high" inherent exposure to at least one social issue. By comparison, only 26 sectors in our latest environmental risks heat map with $11.7 trillion in debt had "very high" or "high" exposure to one or more environmental risks.

Sectors do not face elevated social credit risks in isolation. Our prior research identified 11 sectors with $2.2 trillion in rated debt that carry elevated credit exposure to environmental risks (i.e., that are scored red or orange overall) and 13 sectors with $20.5 trillion in rated debt that exhibit elevated credit exposure to cybersecurity risks. As illustrated in Exhibit 5, there is some overlap in the sectors that face elevated social and environmental risk overall. Automotive manufacturers, unregulated utilities and power companies, commodity chemicals, and coal mining and terminals face elevated credit risk in both categories.

Exhibit 5

Sectors with high social risk may also have elevated exposure to environmental and cyber risks

Comparison of sectors with relatively high overall credit exposure to social, environmental and cyber risks



Note: Red and orange are defined as "Very High Risk" and "High Risk" for social considerations, "Elevated Risk - Immediate" and "Elevated Risk - Emerging" for environmental considerations, and "High" and "Medium High" for cyber risks. Please see relevant heat map appendices for nuances in the category definitions.
Source: Moody's Investors Service

The linkages between exposure to cyber and social risks can be more intertwined, with seven sectors scored as elevated (either red or orange) for both. Sectors that handle large amounts of confidential data, or which interact with stakeholders through online, digital, or mobile channels, tend to be exposed to both types of risk.

Exposure to demographic and societal trends is particularly widespread, with 28 sectors carrying "very high" or "high" inherent exposure

Across non-governmental sectors, our heat map points to 28 sectors accounting for $8.2 trillion in rated debt with "very high" or "high" inherent exposure to demographic and societal trends (see Exhibit 6). This category reflects the effects of changing demographic and societal trends that, over time, can affect consumption patterns, investment decisions and the savings rates of the customers or communities in which businesses operate. Sectors in this category face a growing susceptibility to changing consumer preferences, digital innovation and technological change, and socially driven regulation.

Exhibit 6

Exposure to demographic and societal trends is elevated across multiple industries

Distribution of category scores for sectors with "high" or "very high" exposure to demographic and societal trends

Key: Customer Relations | Human Capital | Health & Safety | Responsible Production | Demographic & Social Trends | Very High Risk | High Risk | Moderate Risk

Sectors	Customer Relations	Human Capital	Health & Safety	Responsible Production	Demographic & Social Trends	Overall Risk Score
Airlines	Moderate Risk	High Risk	Moderate Risk	Moderate Risk	High Risk	Moderate Risk
Asset Backed Securities - Student Loans	High Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	High Risk
Asset Backed Securities - Tobacco Settlement	High Risk	Moderate Risk	Moderate Risk	Moderate Risk	Very High Risk	Moderate Risk
Automobile Manufacturers	Moderate Risk	High Risk	Moderate Risk	High Risk	High Risk	High Risk
Beverage Industry	High Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	Moderate Risk
Chemicals - Commodity	Moderate Risk	Moderate Risk	Very High Risk	High Risk	High Risk	High Risk
Coal Mining and Coal Terminals	Moderate Risk	High Risk	Very High Risk	High Risk	High Risk	High Risk
Education and Not-for-Profits	High Risk	High Risk	Moderate Risk	Moderate Risk	Very High Risk	High Risk
Gaming Industry	High Risk	Moderate Risk	Moderate Risk	Moderate Risk	Very High Risk	High Risk
Health Insurance Companies	High Risk	Moderate Risk	Moderate Risk	Moderate Risk	Very High Risk	High Risk
Life Insurance	High Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	Moderate Risk
Mass Transit	Moderate Risk	High Risk	High Risk	Moderate Risk	High Risk	Moderate Risk
Media & Broadcasting	Moderate Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	Moderate Risk
Medical Products and Devices	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	High Risk	Moderate Risk
Not for Profit Hospitals	High Risk	Very High Risk	High Risk	High Risk	Very High Risk	High Risk
Packaging Manufacturers: Metal, Glass, and Plastics	Moderate Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	Moderate Risk
Pension Funds	Moderate Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	Moderate Risk
Pharmaceuticals	Very High Risk	Moderate Risk	Moderate Risk	High Risk	Very High Risk	High Risk
Power Generation Projects	Moderate Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	Moderate Risk
Private Hospitals - Acute Care and Specialty	Moderate Risk	High Risk	High Risk	High Risk	Very High Risk	High Risk
Public Sector Housing	Moderate Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	Moderate Risk
Publishing	Moderate Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	Moderate Risk
Regulated Electric and Gas Utilities with Generation	Moderate Risk	Moderate Risk	High Risk	High Risk	High Risk	Moderate Risk
Restaurants	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	High Risk	Moderate Risk
Retail and Apparel	High Risk	Moderate Risk	Moderate Risk	High Risk	High Risk	Moderate Risk
Telecommunications	Moderate Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	Moderate Risk
Tobacco	Very High Risk	Moderate Risk	Moderate Risk	Moderate Risk	Very High Risk	High Risk
Unregulated Utilities and Power Companies	Moderate Risk	Moderate Risk	High Risk	High Risk	High Risk	High Risk

Source: Moody's Investors Service

Demographic pressures, such as greying populations, employment levels and migration patterns can erode demand for core products, pressuring revenue and cost structures. Shifting generational values, concerns over fair pricing, socially driven campaigns (e.g. anti-obesity drives) or demand for sustainable products can also hurt a sector's reputation and business strategy. Many companies have begun to adopt the United Nations' Sustainable Development Goals as a framework to align corporate performance and stewardship with these rapidly evolving trends – a dynamic driven in part to minimize potential risks.

All 12 private sectors with an overall sector score of "high risk" have "very high" or "high" inherent exposure to demographic and societal trends. The remaining 16 sectors with "very high" or "high" exposure to demographic and societal trends have an overall score of "moderate risk" for a variety of reasons, including the diversification and flexibility of their business models, which allows the sector to adapt to slow-moving societal trends. Societal trends may also vary across regions. For instance, air travel's increased penetration

in developing countries as young, affluent populations look to travel overseas bodes well for growth in the airline industry, even as sustainability considerations temper growth prospects in more traditional markets.

Sixteen sectors are highly exposed to customer relations issues

Sixteen sectors have "very high" or "high" inherent exposure to customer relations. Collectively, they account for $18.4 trillion in rated debt.

Data security and customer privacy are important considerations in this area for sectors with access to vast amounts of private personal data, such as banking, healthcare and education. The handling of data security and customer privacy is critical for banks, for example, because they access large amounts of personal data. This is becoming increasingly important with the expansion of online business and tightening regulatory standards. Access to sensitive personal data also increases vulnerability to cyber attacks and data mismanagement, which can lead to higher operational costs, legal liability and brand reputation issues (see Cross-Sector - Global: Credit implications of cyber risk will hinge on business disruptions, reputational effects, 28 February 2019).

Additionally, a number of sectors are exposed to product disclosure and labeling issues, including pharmaceuticals, tobacco, personal loan asset-based securities and gaming. These sectors all have exposure to the risk of inaccurate or misleading labeling, which can trigger customer boycotts or litigation, and ultimately limit business flexibility.

Twenty sectors are high;y exposed to responsible production concerns

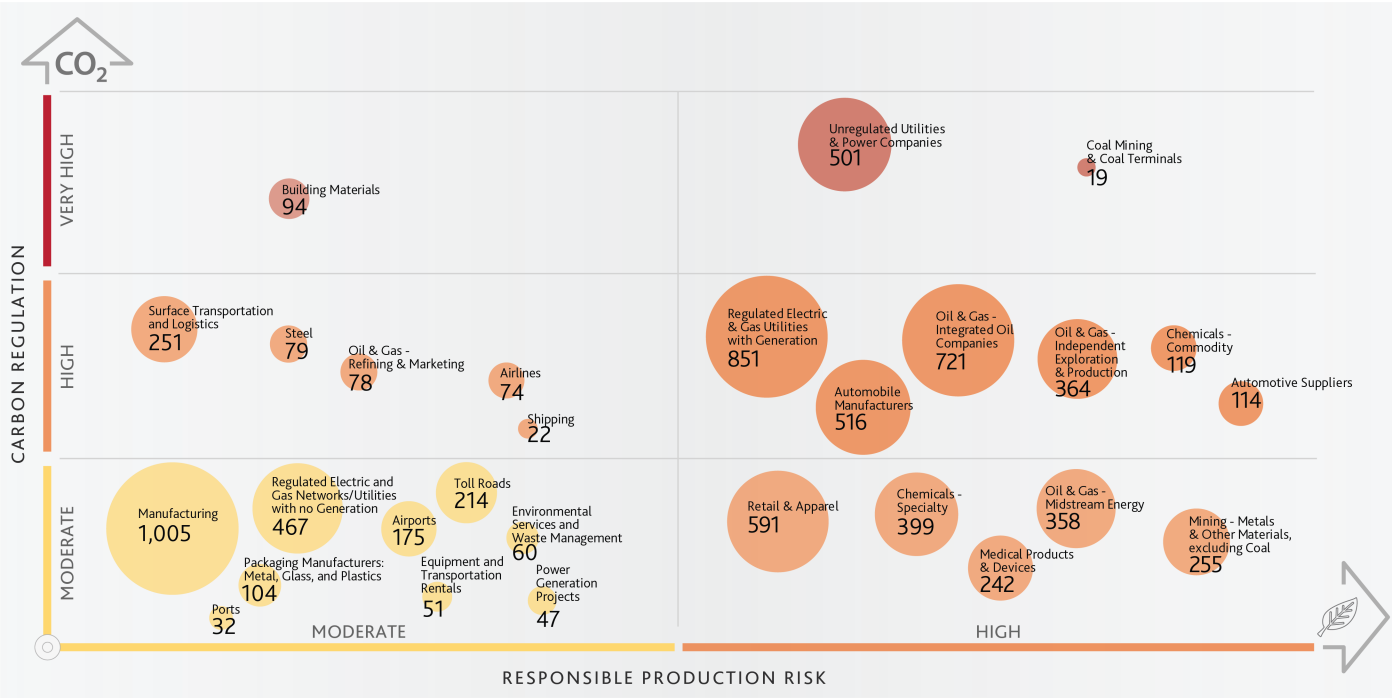
Twenty sectors, representing $7 trillion in rated debt, have "very high" or "high" inherent exposure to responsible production risks. This is a broad category that incorporates risks related to the management of supply chain partners and production processes. These risks include the potential impact of product failures, recalls or contaminations, as well as headline risks from waste disposal, pollution issues and supply chain practices, such as human rights controversies and violations. Highly exposed sectors typically have multiple inputs to their production processes, and are particularly exposed to supply chain management issues such as employee working conditions and human rights violations that can hurt an issuer's brand reputation and business operations.

Carbon-intensive industrial sectors often exhibit high exposure to responsible production issues. Eight of the 20 sectors that scored "high" for responsible production also scored "very high" or "high" for carbon regulation in our 2018 environmental risks heat map, including automotive manufacturers and suppliers, utilities, and coal mining and coal terminals (Exhibit 7). There may not be a direct correlation in these exposures. Indeed the responsible production issues surrounding these sectors tend to be mainly around waste disposal and local community relations rather than carbon emissions directly. However, the overlap indicates that a number of industrial sectors are confronted with meaningful environmental and social exposures across their value chain.

Exhibit 7

Eight carbon-intensive sectors have "high" or "very high" responsible production risk

Sectors with elevated exposure to carbon regulation and responsible production risks



Note: Bubbles sized relative to value of rated debt ($ billion).
Source: Moody's Investors Service

It is not just carbon-intensive sectors that face responsible production risks. Consumer-oriented sectors such as retail, restaurants and consumer goods also score "very high" or "high" given their inherent exposure to product failures, supply chain risk due to their reliance on external suppliers, and product sustainability.

Retailers rely heavily on external suppliers, implying risks related to responsible sourcing. While the sustainability credentials of supply chain partners may rarely translate into negative credit consequences for issuers, over time retailers will look to enhance sourcing transparency and increase investments in sustainable supply chains to protect their brand image and mitigate potential reputational risks.

Health and safety issues are prominent in 13 sectors

Health and safety issues relate to how issuers create healthy and safe work environments for their employees and contractors. Thirteen sectors, representing $4.1 trillion in rated debt, have "very high" or "high" inherent exposure to work-related injury and illness, including chemicals, coal mining, construction, hospitals, and regulated and unregulated utilities. These sectors are highly exposed to hazardous materials, on-site safety related risk or specific health-related risks. The credit impact on issuers in most of these sectors tends to be mitigated by adherence to health and safety regulations and protocols. However, unforeseen or acute disasters can nonetheless be credit negative, as can operations in countries or jurisdictions without adequate safety regulations.

Ten sectors score "very high" or "high" for human capital exposure

Ten sectors representing $3.4 trillion of debt have "very high" or "high" inherent exposure to human capital risk. Some of these sectors are labor-intensive and/or highly unionized in certain geographies, such as airlines and mass transit. While such sectors have experience in dealing with issues such as labor disputes and collective bargaining, issuers remain exposed to potential flare-ups in industrial action. Other sectors, such as the not-for-profit hospital industry, tend to rely on highly specialized workforces that are vulnerable to recruitment and retention challenges. Additionally, an increased focus on automation and other technological advances has increased the need for specialized employees to manage advanced machinery and programs. While incorporating automation into

core operations has improved productivity, its impact on employment levels risks sparking opposition from organized labor and local politicians.

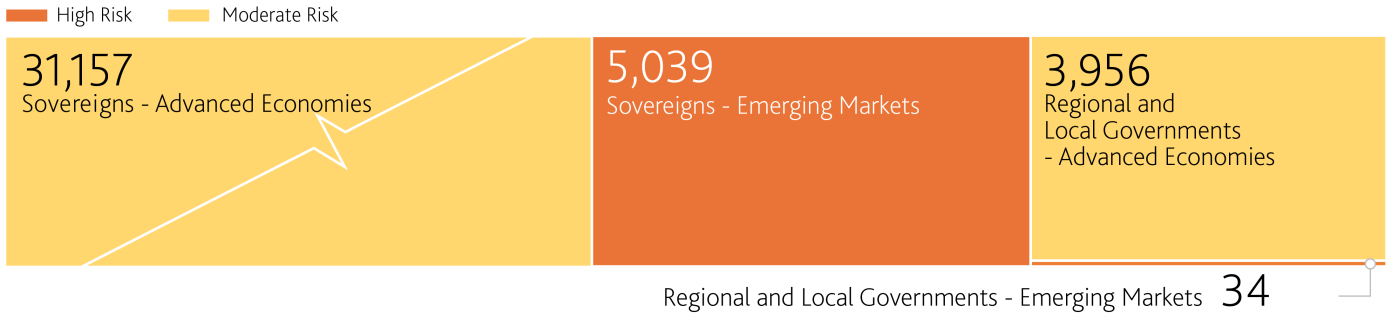
Credit implications of social risks are more pronounced for EM governments than advanced economy peers

The social risk exposures of sovereign and RLG issuers in emerging markets are categorized as "high risk," as shown in Exhibit 8. Access to healthcare, housing and basic services, income inequality, educational attainment and crime rates are all significant challenges in the developing world and constrain credit quality. The risks can vary significantly across EM countries, regions and local governments.

Exhibit 8

The credit quality of EM sovereigns and RLGs faces high social risks overall

Breakdown of relative social risk exposure of governments in advanced economies and emerging markets



Note: Boxes are sized relative to the value of rated debt ($ billion).
Source: Moody's Investors Service

One of the most significant social risks for both EM sovereigns and RLGs is access to basic services, with lack of adequate infrastructure a significant limitation on productivity and economic growth.

Employment levels and wages are also a significant social risk for both sectors, particularly RLGs. Income inequality and low wages are prevalent in developing economies and limit growth. In EM RLGs in particular, high unemployment and income inequality pressure revenue but drive social spending. Growth in both sectors is also constrained by the effects of low educational attainment and elevated crime and violence. These factors create pressure for new spending on teachers, school construction and public safety.

By contrast, the credit risk of social risks is moderate for sovereigns and RLGs in advanced economies. To be sure, all advanced economies face challenges relating to a wide range of social risks including inequality, healthcare, housing, education and crime. Demographic trends pose the greatest social challenge as aging populations drive higher social spending and low population growth constrains GDP growth, the tax base and the ability to fund pension liabilities. RLGs in advanced economies are also pressured by social factors including rising housing costs.

However, advanced economy sovereign and RLG issuers typically operate in larger, more diverse economies than their EM counterparts, with far stronger institutional governance frameworks. This provides them with significant fiscal flexibility to mitigate the credit implications of social risks in the near term, though these factors can vary significantly and require issuer-specific analysis.

Appendix A: Social categories for private and public sectors

Exhibit 9

Five social issues most relevant to private-sector issuers

Customer Relations

» Data security & customer privacy
» Fair disclosure & labelling
» Responsible distribution & marketing

Human Capital

» Labour relations
» Human resources
» Diversity & inclusion

Demographic & Societal Trends

» Demographic change
» Access and affordability
» Social responsibility
» Consumer activism

Health & Safety

» Accident & safety management
» Employee health & well-being

Responsible Production

» Product quality
» Supply chain management
» Community stakeholder engagement
» Bribery & corruption
» Waste Management

Note: Subcategories are representative and not exhaustive. We use the private-sector social categories for business-like governmental entities, such as municipal utilities and mass transit enterprises.
Source: Moody's Investors Service

Exhibit 10

Six social issues most relevant to governmental issuers

Demographics

» Age distribution
» Immigration
» Birth rates
» Racial & ethnic composition/trends

Labor & income

» Labor force participation
» Income inequality

Education

» Access to primary/ secondary/tertiary
» Educated populace
» Literacy

Housing

» Availability and access
» Condition of housing

Health and safety

» Healthcare
» Food security
» Environmental quality
» Personal safety & well-being

Access to basic services

» Water
» Sewer
» Electricity
» Financial services
» Transportation
» Telecom/Internet

Note: Subcategories are representative and not exhaustive. We use the private-sector social categories for business-like governmental entities, such as municipal utilities and mass transit enterprises.
Source: Moody's Investors Service

Appendix B: Heat map sector index

Sectors listed alphabetically with overall social risk score and commentary page number

Sector	Overall Social Risk Score	Page
Airlines	Moderate Risk	21
Airports	Low Risk	39
Asset-Backed Securities - Aircraft	Moderate Risk	21
Asset-Backed Securities - Auto Loans, Auto Leases, Floorplan, Car & Truck Rental	Low Risk	39
Asset-Backed Securities - Personal Loans	Moderate Risk	22
Asset-Backed Securities - Credit Cards	Low Risk	39
Asset-Backed Securities - Small and Medium Enterprises	Moderate Risk	22
Asset-Backed Securities - Student Loans	High Risk	15
Asset-Backed Securities - Tobacco Settlement	Moderate Risk	22
Asset-Backed Securities - Wireless Towers	Low Risk	40
Asset Managers	Moderate Risk	23
Automobile Manufacturers	High Risk	15
Automotive Suppliers	Moderate Risk	23
Banks and Finance Companies	Moderate Risk	24
Beverage Industry	Moderate Risk	24
Building Materials	Moderate Risk	25
Business and Consumer Services	Moderate Risk	25
Chemicals - Commodity	High Risk	16
Chemicals - Specialty	Moderate Risk	26
Coal Mining and Coal Terminals	High Risk	16
Collateralized Debt and Loan Obligations	Low Risk	40
Collateralized Debt and Loan Obligations - Project Finance and Infrastructure Assets	Moderate Risk	26
Commercial Mortgage-Backed Securities	Low Risk	40
Construction	Moderate Risk	26
Consumer Goods	Moderate Risk	27
Covered Bonds	Moderate Risk	27
Distribution and Supply Chain Services	Low Risk	41
Education and Not-for-Profits	High Risk	16
Environmental Services and Waste Management	Moderate Risk	27
Equipment and Transportation Rentals	Low Risk	41
Financial Guarantors	Low Risk	41
Gaming Industry	High Risk	17
Health Insurance Companies	High Risk	17
Homebuilding and Property Development	Low Risk	42
Life Insurance	Moderate Risk	28
Manufacturing	Moderate Risk	28
Mass Transit	Moderate Risk	28
Media & Broadcasting	Moderate Risk	29
Medical Products and Devices	Moderate Risk	29
Mining - Metals and Other Materials, excluding Coal	Moderate Risk	29

Source: Moody's Investors Service

Sectors listed alphabetically with overall social risk score and commentary page number (continued)

Sector	Overall Social Risk Score	Page
Mortgage Insurance	Low Risk	42
Not-for-Profit Hospitals	High Risk	18
Oil & Gas - Independent Exploration & Production	Moderate Risk	30
Oil & Gas - Integrated Oil Companies	Moderate Risk	30
Oil & Gas - Midstream Energy	Moderate Risk	30
Oil & Gas - Oilfield Services	Moderate Risk	31
Oil & Gas - Refining & Marketing	Moderate Risk	31
Packaging Manufacturers: Metal, Glass, and Plastics	Moderate Risk	31
Paper and Forest Products	Moderate Risk	32
Passenger Railways	Moderate Risk	32
Pension Funds	Moderate Risk	33
Pharmaceuticals	High Risk	18
Ports	Moderate Risk	33
Power Generation Projects	Moderate Risk	33
Private Hospitals - Acute Care and Specialty	High Risk	19
Privately Financed Public Infrastructure Projects (PPPs)	Low Risk	42
Property, Casualty and Reinsurance	Moderate Risk	34
Protein and Agriculture	Moderate Risk	34
Public Sector Housing	Moderate Risk	34
Publishing	Moderate Risk	35
Real Estate Trusts & Other Commercial Property Firms	Low Risk	43
Regional and Local Governments - Advanced Economies	Moderate Risk	35
Regional and Local Governments - Emerging Markets	High Risk	19
Regulated Electric and Gas Networks/Utilities with no Generation	Moderate Risk	35
Regulated Electric and Gas Utilities with Generation	Moderate Risk	36
US Municipal Utilities, Water and Wastewater, and State Revolving Funds	Low Risk	43
Residential Mortgage Backed Securities	Moderate Risk	36
Restaurants	Moderate Risk	36
Retail and Apparel	Moderate Risk	37
Securities Industry and Financial Intermediaries	Low Risk	43
Semiconductors & Technology Hardware	Low Risk	44
Shipping	Moderate Risk	37
Sovereigns - Advanced Economies	Moderate Risk	37
Sovereigns - Emerging Markets	High Risk	19
Steel	Moderate Risk	38
Surface Transportation and Logistics	Low Risk	44
Telecommunications	Moderate Risk	38
Title and Trade Credit Insurance	Low Risk	44
Tobacco	High Risk	20
Toll Roads	Low Risk	45
Trading Companies	Low Risk	45
Unregulated Utilities and Power Companies	High Risk	20

Source: Moody's Investors Service

Appendix C: Detailed heat map

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

High Risk	Asset Backed Securities - Student Loans
Key Issue: Significant levels of interest in the student loan burdens of Americans among US and state policymakers will likely continue, resulting in continuing uncertainty for student loan ABS Total Debt: $236 billion	The debt burden of student loans and the affordability of education in the US have become material social issues. Significant levels of interest among US and state policymakers in the student loan burdens of Americans will likely persist, resulting in continued uncertainty for student loan ABS. However, the high exposure of student loan ABS to a socially driven policy agenda relating to the debt burden of student loans and the affordability of education is currently mitigated because the credit implications of specific regulatory or legislative actions could be positive, negative or both. Customer relationship risks associated with the disclosure of servicing policies, gainful employment and other demographic trends have high implications for the sector.

High Risk	Automobile Manufacturers
Key Issue: Product recalls and supplier network disruptions are significant issues, while high demographic and societal risks reflect environmental regulation and the emergence of "Auto 2.0" Total Debt: $516 billion	Demographic and social risks are high because of environmental regulation and the emergence of "Auto 2.0" (i.e. the road ahead to autonomous vehicles and ride sharing). Consumer preferences and demographics, which drive income levels, are important factors determining sales, and demographic trends drive sales growth in each market. Increased social awareness and a focus on emissions control provide a backdrop for tightening regulation. Human capital risk is high because experienced engineers and trained factory workers are important to research and development, while a considerable risk relates to product recalls and supplier network disruptions. Product quality issues can weaken brand strength, particularly in relation to emissions/fuel efficiency and safety, and along with negative consumer sentiment can damage the reputation of a company's products or prompt boycotts. In addition, the supply chain depends heavily on parts suppliers. Health and safety risks are low because the industry provides a relatively safe environment for workers. Although labeling is important, for example in relation to fuel economy, emissions and horse power, examples of a negative credit impact because of labeling are rare. Tightening emissions regulations that increase the focus on products' fuel-efficiency could generate a moderate level of risk, as illustrated by the "diesel-gate" scandal in Europe. However, even the emissions scandal surrounding Volkswagen has not weakened the company's market position.

Private Sector Categories

Responsible Production | Health & Safety | Demographic & Social Trends | Customer Relations | Human Capital

Public Sector Categories

Demographics | Health & Safety | Education | Housing | Labor & Income | Access to Basic Services

Icon color key: Very high | High | Moderate | Consistently low

High Risk — Chemicals - Commodity

Key Issue:
Health and safety is the main social risk facing companies in the commodity chemicals sector

Total Debt:
$119 billion

Operational incidents causing serious injury or death occasionally occur, but less frequently and to a lesser extent in developed economies. Accidents can generate negative publicity, as well as pose risks to production sustainability and franchise value over time. However, despite the risks inherent in operating production facilities and transporting chemicals, major participants in developed economies have a track record of responsible behavior and adhering to strict regulations, and tend to react quickly to media or social pressure. Companies occasionally face unplanned production downtime linked to operational problems or bad weather.

For the commodity chemical industry and downstream products and plastics segments, certain product categories could face social risks if problems with products, either real or perceived, result in product categories being eliminated as a result of regulation or social pressure. Products that currently fall into this category include single-use plastics such as packaging or other end-uses.

High Risk — Coal Mining and Coal Terminals

Key Issue:
The sector faces very high health and safety risks and is highly exposed to political agendas

Total Debt:
$19 billion

The sector faces social risks that in aggregate could be material to companies' credit quality in the medium term. Health and safety risk is "Very High" because of safety-related issues such as mine collapses and health-related issues such as Black Lung, which has been sufficiently significant to attract political attention and a specific funding mechanism. Human capital risk is "High", reflecting aging workforces and union disputes in certain geographies, though much of the industry is not unionized. Customer relations risk is low because the sector faces no material issues relating to data security, customer privacy, labeling or distribution/marketing.

Rules, regulations and other items vary by geography and within geographies (for example, at the state level in the US). Responsible production risk is "High" because a coal mine is often the most significant local employer and waste disposal can be an issue, but product quality and supply chain risks are less significant. Demographic and societal trends risk is "High", mostly because of the sector's exposure to the socially driven policy agenda with respect to climate change and decarbonization. Demographic trends and consumer preferences are less significant risks.

High Risk — Education and Not-for-Profits

Key Issue:
Demographic and societal trends pose the greatest social risks in the higher education and not-for-profit sectors

Total Debt:
$297 billion

Declining numbers of high school/secondary school graduates and the changing profiles of students are putting pressure on higher education institutions to innovate and adapt, while a growing focus on affordability and the "value proposition" of higher education is challenging resource-limited institutions to remain competitive. These developments are spurring programmatic innovation, including pricing and recruitment strategies. Changing consumer preferences are potential credit challenges for not-for-profit organizations.

Human capital risk is high because tenure and unionization complicate programmatic and financial changes. The higher education sector in particular has multiple constituents, including governments, students, parents and faculty donors, as well as local communities where the university is often the largest employer. A shared governance model and the need to incorporate the occasionally competing interests of multiple constituents increase social risks and governance challenges. Institutions are also exposed to demands for diversity and inclusion, as well as sexual harassment and abuse concerns. Levels of student activism are high, but rarely have a credit impact.

Private Sector Categories

Responsible Production | Health & Safety | Demographic & Social Trends | Customer Relations | Human Capital

Public Sector Categories

Demographics | Health & Safety | Education | Housing | Labor & Income | Access to Basic Services

Icon color key: Very high | High | Moderate | Consistently low

High Risk — Gaming Industry

Key Issue:
The sector is exposed to high customer relations and responsible production risks

Total Debt:
$89 billion

Demographic and consumer preferences are moving in a direction that does not favor traditional casino gaming, while younger generations are not spending as much time playing casino-style games as their predecessors. In addition, gaming is popular but highly discretionary in terms of consumer demand. Most jobs in the sector are not considered highly skilled.

Negative rating actions on European gaming companies have reflected social responsibility failings, and tighter regulation is likely to persist. Federal and regional governments have placed restrictions on betting amounts and gambling locations in response to pressure from lobby groups, causing sector revenue to fall, while increased compliance costs are pressuring companies' margins. Governments are increasing taxes to compensate for reduced tax income, further limiting profitability.

Changing consumer preferences are a social risk for the sector because an increasingly internet-focused generation is driving gambling activities online, where problem gambling and money-laundering are harder to detect. Failings have occurred even where companies have adopted robust preventative measures. A further risk relates to responsible marketing and distribution, which can be a source of social responsibility failings where companies continue to promote their products to individuals already identified as problem gamblers.

High Risk — Health Insurance Companies

Key Issue:
Health insurers face elevated social risks relating to their position on the front line for most people in terms of managing healthcare costs

Total Debt:
$124 billion

Health insurers in the US occupy a central position in one of the most politically sensitive economic sectors. Healthcare costs have risen at a faster rate than inflation for decades, and unaffordable medical bills are meaningful concern for many Americans. National healthcare expenditure in the US totaled $3.5 trillion, or around 17.9% of GDP, in 2017, and this share is only likely to grow as the population ages. While the Affordable Care Act helped reduce the number of uninsured individuals, almost 30 million US citizens remain uninsured. As a result, politicians are seeking to reduce healthcare costs and expand coverage.

Heightened attention on healthcare in the run-up to the 2020 US elections is increasing risks for insurers. Several presidential candidates have endorsed a single-payer proposal that would largely eliminate private health insurance in favor of government-run health insurance. Advocates of such proposals do not believe that health insurers play a vital role in managing the health of their members, rather viewing them as middle-men making unwarranted returns on their investment.

More modest proposals would add a public option to compete against private insurance in the individual market and, under some proposals, the employer market as well. Under the more expansive public option proposals, health insurers would be pressured by new government competition. An expansive government option could destabilize the employer-sponsored market.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

High Risk — Not for Profit Hospitals

Key Issue:
The sector faces high social risks relating to an aging US population, a lack of a highly skilled workforce, and state and federal healthcare legislation

Total Debt:
$238 billion

The US' aging population is having a profound impact on healthcare. While demand for inpatient and outpatient services is increasing as people age, such services are reimbursed at Medicare rates that typically lag commercial insurance reimbursement. The Affordable Care Act's (ACA) provision for Medicaid expansion is adding to demand for healthcare services, requiring rated non for profit hospitals in the US to increase their number of clinical staff, specifically nurses. This is driving up compensation expense, which already accounts for around 50%-60% of a health system's annual expense base.

The supply of highly skilled clinical personnel is limited and staffing shortages are appearing throughout the US, mostly in rural areas, where it has become increasingly difficult to recruit and retain healthcare professionals. Threats of work stoppages are also more frequent as clinical staff demand better compensation and working conditions. Staffing shortages may reduce the quality of care, posing reputational, litigation and regulatory risks, while also increasing providers' reliance on contract labor and travelers.

The rising cost of healthcare and reimbursements to hospitals from government sources are key policy issues at the state and federal levels, and will be a key issue in the 2020 US federal elections. A number of state legislatures are developing eligibility requirements for Medicaid, whether or not they have expanded. We expect the outcome of the 2020 elections to drive further debate around the ACA, including repeal.

Health systems provide essential services and are often among the largest employers in their communities. To streamline operations, some have closed facilities or consolidated services, requiring patients to travel longer distances for some services. While closing or consolidating lower-performing or redundant services may improve operating margins, such actions can also harm a system's reputation and prompt demonstrations against management decisions.

Systems' reliance on complex third-party equipment and machinery to perform medical procedures means that malfunctions of such equipment can expose them to reputational and litigation risk. In addition, because hospitals compile vast amounts of private personal information, the potential for theft or misuse of patient data may impair a health system's reputation, as well as subject it to regulatory penalties or litigation.

High Risk — Pharmaceuticals

Key Issue:
The sector faces rising social risks related to the pricing of its products, many of which are funded from government sources

Total Debt:
$798 billion

Social risks are high for pharmaceutical companies and wholesale distributors. High and rising costs have caused companies to step up their efforts to reduce drug expenditure. Several proposed regulations that would alter the reimbursement system for pharmaceuticals remain pending in the US, including allowing imports of prescription drugs from other countries and adopting an international pricing model for some products. Outside the US, direct government involvement in pricing reductions will continue, most notably in Japan. The overhang of these potential changes is dampening the industry's long-term growth prospects, contributing to M&A event risk. Responsible production considerations include product safety risk, which generates continuing litigation exposures for the pharmaceutical industry. The assertion that product labeling was inadequate and failed to warn consumers of the risks of the products has been at the heart of some litigation, and previous industry exposures (such as Wyeth's diet drugs and Merck's Vioxx) have been sizable. A number of companies face smaller but nevertheless continuing exposure, while others are the subject of opioid-related lawsuits. A number of branded and generic companies face the risk that plant inspections could result in warning letters and/or disruption to production.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

High Risk — Private Hospitals - Acute Care and Specialty

Key Issue:
The sector faces rising social risks related to the cost of medical procedures as consumers bear greater financial responsibility for their healthcare costs

Total Debt:
$101 billion

Rising healthcare costs have become a more significant pain point for consumers, particularly as health insurers through plan design (rising co-pays, higher deductibles and more restrictive networks) place more financial responsibility on patients to meet their healthcare costs. This has resulted in consumers seeking care in the lowest-cost setting, ensuring that providers are in their insurance network, and deferring or foregoing care in certain circumstances. Technological advances are also enabling more procedures to be performed in a lower-cost, alternative care settings (outside a hospital). These factors inevitably create sales and earnings headwinds for rated hospitals in the US, particularly those lacking a significant portfolio of outpatient facilities to mitigate this trend.

Hospitals in less densely populated areas often need to weigh the importance of service line offerings to their local communities against the need for these departments to be profitable. A decision by a hospital to exit certain service lines can generate a backlash in local communities, as well as reputational risk. More broadly, hospitals have to tread carefully when divesting facilities because this can prompt physician defections with the potential to reduce revenue and profit.

Hospitals are now required by law to provide price transparency data on their websites and to update these data annually. Other proposals seek to address the scenario in which patients receive surprise medical bills. More significantly, uncertainty exists as to whether parts of or potentially the whole of the Affordable Care Act could be repealed. The cost of staffing hospitals with proficient medical specialists, hospitalists and nurses is relatively high and can be volatile, while nurse shortages can be exacerbated during periods of strong economic growth. In hospitals where unions are prevalent, the risk of a strike by nurses can have significant reputational and financial effects.

High Risk — Regional and Local Governments - Emerging Markets

Key Issue:
Social risks are high for some emerging market regional and local governments, and may have a material impact on credit in the medium term

Total Debt:
$34 billion

Depending on the division of responsibilities across governments, central and/or regional governments can play a significant role in mitigating the credit impacts of social risks on sub-sovereigns, at least in the short to medium term. However, social risks are vulnerabilities and may have a material credit impact in the medium term. Labor and income and access to basic services are the most significant social risks. Relatively high unemployment and high levels of income inequality in some developing sub-sovereigns weaken economic growth and pressure revenue and spending. Some developing sub-sovereigns also have large informal economies, depressing formal labor participation and constraining taxation revenue to meet social spending. Many have significant unaddressed infrastructure needs that require significant investment, though national governments would share some of the burden.

High Risk — Sovereign Emerging Markets

Key Issue:
Emerging market sovereigns' vulnerability to social risks is high overall, though exposure can vary significantly across regions and countries

Total Debt:
$5039 billion

Access to basic services is the main social risk that emerging market sovereigns face, while infrastructure needs are a key constraint on growth for many developing nations. A lack of adequate infrastructure limits productivity growth, reduces private investment, and constrains export and international trade, all of which are relevant factors for ensuring sustainable growth.

Labor and income, education and health and safety are other important social risks. Inequality and low wages are common in most developing nations, while low education levels limit economic growth. High levels of violence, as in many Central American countries, reduce investment and pressure public finances. Unlike developed economies, the demographics of developing sovereigns pose limited credit risks. Most have younger populations and their demographic structures are more supportive of future growth as the labor force expands.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

High Risk	Tobacco
Key Issue: The sector faces high social risks relating to the association of the use of its traditional combustible products with health conditions including cancer Total Debt: $175 billion	Regulators have yet to recognize tobacco manufacturing companies' claims that a new generation of tobacco products, including heated tobacco and e-vapor, has reduced-risk effects on human health. Regulatory changes that could favorably impact the sector's social risk profile relate to its ability to market potentially reduced-risk products as a safer alternative to traditional cigarettes and benefit from different and potentially less punitive tax regimes, or at least regimes that create a more level playing field. Tobacco regulations to date have been confined to increasing health warnings (ultimately leading to plain packaging) and raising taxes. However, the FDA has established a new framework that increasingly recognizes these differences, as has the European Union, whose Tobacco Product Directive identifies Novel Smokeless Tobacco Products as a separate product category from conventional tobacco products.

High Risk	Unregulated Utilities and Power Companies
Key Issue: Social risks for unregulated utilities and power companies generally stem from the same sources, primarily responsible production and demographic and societal trends Total Debt: $501 billion	The continuous ability to source fuel, supply and demand changes, and markets' adaptation to technological shifts are ongoing pressures. Socially driven policy agendas and observable changing consumer preferences based on increased environmental awareness will continue to affect the sector's credit quality in the medium term. Community relations and engagement are particularly important in respect of obtaining permits for new developments. Permits and licenses are typically renewed and have to meet particular requirements such as emissions levels and water discharge. Community opposition and regulations can also significantly affect supply chain logistics such as transmission lines, gas pipelines and other fuel transportation. In addition to health and safety risks associated with maintaining heavy equipment and machinery, the sector is also prone to event risks with social risk repercussions, such as major nuclear and hydropower disasters. Significant health and safety regulations and inspections are in place to ensure that standards are met. Social risks associated with longevity of the workforce, recruitment and retention are moderate overall, but can be higher in locations where there is a shortage of specialized labor for solar photo-voltaic maintenance, offshore wind or a need for expatriate labor in the initial stages. Certain specialized labor associated with nuclear generation is also limited given aging fleets and nuclear energy's lower share in the overall global energy mix. In some countries or regions with unionized workers, or where utilities may employ a large percentage of the workforce, there may be political pressure to maintain the operations of certain assets given the potential risk of job losses. However, this can delay but not deter some inevitable sector transitions.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Airlines

Key Issue:
Stringent regulatory standards and robust growth prospects mitigate the airline industry's broad exposures to social risks

Total Debt:
$74 billion

Airlines' smooth operations rely heavily on interconnected technological platforms functioning properly. Secure access to all systems is paramount, as is the security of customer and company information. Data/operating system interruptions are infrequent, as are releases of confidential information.

Unionization is the norm in the airline industry. Incidences of industrial action vary by continent, but unions in France and Germany are typically the most active. Strikes in the US are essentially illegal. Airlines' effective operations rely on the highly specialized role of pilots and mechanics, and a sufficient supply is not assured in the near term. However, the industry is likely to incentivize more people to pursue such careers, alleviating concerns in the next five years and beyond.

The industry is highly regulated in respect of aircrafts' technical certification, operation and safety, and related maintenance functions and customer rights. Air travel, particularly in the developed world, has a strong safety record. Participation in local communities and contributing at times of need are core to most airlines' corporate cultures.

Population growth, higher disposable incomes, air travel's increased penetration in developing countries and younger generations placing a higher value on experiences compared with purchases of material goods bode well for growth in air travel. However, policies to limit carbon emissions from aircraft are a potential impediment to growth.

Moderate Risk — Asset Backed Securities - Aircraft

Key Issue:
Aircraft ABS exhibit moderate social risks overall, but socially driven policies and regulations could weaken the profitability of airlines that are lessees in the ABS

Total Debt:
$8 billion

The continued expansion of the middle classes and growing per capita incomes, particularly in China and other Asian countries, have driven up passenger volumes, sustaining demand for aircraft. However, slowing growth in demand for air travel because of a global or regional economic slowdown or severe aviation event (such as terrorism) could reduce demand for aircraft in future. Socially driven policies and regulations such as a push for minimum legroom could reduce capacity, weakening the profitability of airlines that are the lessees in the ABS.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Asset Backed Securities - Personal Loans

Key Issue:
Personal loans ABS have a high exposure to customer relations risk, but their exposure to social risks is moderate overall

Total Debt:
$50 billion

Customer relations risk stems from product disclosures, high interest rates and the business models of new lenders, which can give rise to regulatory uncertainty and litigation risk. However, the sector is small and less visible than other types of loans such as credit cards, student loans and auto loans. Personal loans ABS are exposed to broad demographic and societal trends, particularly policy responses to high interest rates. Regulation may target borrowers with weak credit quality. In EMEA, social risks are lower overall for this sector due to more established lending practices.

Moderate Risk — Asset Backed Securities - Small and Medium Enterprises

Key Issue:
SME ABS are moderately exposed to health and safety, responsible production, and demographic and societal trends risks

Total Debt:
$80 billion

SMEs are significant employers and consequently exposed to social trends and risk factors that are broadly in line with their countries of operation. Small firms typically have fewer financial resources with which to respond to changing regulatory requirements in respect of health and safety or minimum wages, for example. The labor-intensive aspect of work in their main sectors reduces SMEs' ability to benefit from automation or artificial intelligence. However, risks are limited overall because SME securitizations benefit from diversification in their constituent industries and are structured to provide credit enhancement to the rated notes.

Moderate Risk — Asset Backed Securities - Tobacco Settlement

Key Issue:
Continued shifts in attitudes towards smoking, as well as further regulation, pose moderate risks for tobacco settlement ABS

Total Debt:
$12 billion

Tobacco settlement ABS are exposed to social risks that decrease cigarette consumption, reducing the revenue available to repay tobacco bonds. Further demographic changes and shifts in social attitudes toward smoking could accelerate such declines, and may give rise to further regulations restricting tobacco use. The marketing of new products that are currently less regulated could also expose tobacco companies, who are the obligors in the transactions, to litigation risk. However, we view this risk as moderate at this stage given that regulation generally takes several years to come into effect.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk	Asset Managers
Key Issue: The socially driven policy agenda is positive for ESG-related investment products and services, but the sector's increasing reliance on technology increases data security risks Total Debt: $68 billion	The industry's lack of diversity generates human capital risks in regions where disclosures on organizational diversity, gender pay and board composition are required. There are also emerging risks in customer relations as asset managers seek to move closer to end-investors and because of the sector's increasing reliance on technology, increasing cyber-security risks. Although demographic shifts are negative for the sector in countries with aging populations, the growing adoption of socially driven agendas is positive for investment products with ESG screens and stewardship services, particularly among younger investors. Declining retirement asset levels are coinciding with the retirement of members of the "baby boomer" generation, but wealth transfer presents an opportunity.

Moderate Risk	Automotive Suppliers
Key Issue: Insufficient data security or customer privacy of technical and manufacturing information could expose suppliers to pricing pressure from competitors who have learned to copy product specifications Total Debt: $114 billion	Disclosure and labeling are not significant risks because products are highly negotiated and agreed on before production. Auto parts suppliers build to their original equipment manufacturer (OEM) customers' requirements, making their exposure indirect, while automobile reliability/quality is highly regulated. Although the sector is partly unionized, organized labor is localized. Retaining skilled manufacturing/assembly labor is an issue, typically in developing regions such as Mexico, South America, Eastern Europe and Asia. Newer workers often move to competitors for better wages once trained. Although the automotive assembly industry has a history of worker safety issues, these have largely been remedied over time, and high levels of plant rules, regulations and certifications are now in place for employees. Quality requirements are mandated by the specifications of OEM customers. Inability to adhere to these requirements generates significant excess costs relating to scrappage, excess labor, excess shipping charges and rework time. The shift by US auto manufacturers toward sports utility/crossover utility vehicles and away from passenger cars as consumer preferences change has affected suppliers of both vehicle types, while vehicles' increasing levels of connectivity are another consumer trend affecting parts suppliers. Although an aging population can reduce demand for manually driven cars, it can also increase demand for autonomous driving vehicles and technology. Fuel economy standards have implications for auto parts.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Banks and Finance Companies

Key Issue:
The most relevant social risks for banks arise from customer relations, particularly in the area of data security and customer privacy

Total Debt:
$13315 billion

Data security and customer privacy are critical for banks because they access large amounts of personal data, and are becoming increasingly important as their online businesses expand and regulatory standards tighten. Sizable investments in technology and banks' long track record of handling sensitive client data partly mitigate the associated credit risk.

Fines and reputational damage due to product mis-selling and other types of misconduct are further social risks in the customer relations category. Banks have greater exposure to these risks in developed countries, where such behavior is closely scrutinized by regulators and subject to public opinion. Cases of bank misconduct are frequent and the credit implications (loss of customers or regulatory sanctions) are sufficiently significant to move ratings in some cases.

Shifting customer preferences toward digital banking are increasing information technology costs, while the entrance of digital, nonbanking competitors is affecting sector revenue. Aging populations are a concern in several countries, reflecting the link between age and borrowing and savings habits. Socially driven policy agendas may translate into regulation (such as subsidized lending and consumer protection rules) affecting banks' revenue base.

We expect societal trends to have a mostly modest impact on banks' credit quality. Banks benefit from financial and operational flexibility, and have proved capable of adjusting to emerging social issues over time. Social considerations may also unlock opportunities for banks. For example, greater financial inclusion and access to banking services in emerging markets support economic development by facilitating access to credit and the allocation of financial resources, supporting the sector's growth.

Moderate Risk — Beverage Industry

Key Issue:
Key social risks include customers' health concerns, misdirected marketing policies and/or boycott campaigns, and changing consumer preferences

Total Debt:
$367 billion

While health and safety risks in the beverage industry are low and the sector is a leader in terms of diversity and inclusion, the sector is also exposed to the impact of customers' health concerns. For example, sugar taxes will remain a headwind, though the impact on profitability to date has been short-term and relatively modest.

The fact that beverages are fast-moving consumer goods means that product recall risk is low, while the supply chain is relatively simple. However, changing demographics and consumer tastes could affect the underlying business. Innovation and premiumization offset lower volumes, though both include a risk element. The beverage industry is high-margin and able to offset higher labor costs.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk	Building Materials
Key Issue: Health and safety is the main social risk facing companies in the building materials sector Total Debt: $94 billion	The sector faces a low risk of customer activism or boycotts, and has a relatively limited history of collective bargaining, pay disputes and industrial action. However, it has a sizable exposure to emerging markets where labor laws are less developed, while levels of diversity and inclusion are very low. Although the sector's mining activities have a better safety track record (open pit operations and more stringent safety standards), work in the field is strenuous and involves handling heavy machinery and bulk materials with heavy weights. The commoditized nature of end-products limits the sector's exposure to product recalls, but a risk remains for more engineered products in the light side part of the industry. The sector's reliance on external supply chains is limited because issuers are vertically integrated and self-reliant. Community relations are an important consideration and may influence the granting of extraction permits for rocks, sand and gravels. In addition, a move toward more environmentally friendly housing could prompt a shift in product demand or give rise to technical innovations. However, the sector has traditionally been slow-moving and substitution risk is relatively low, particularly on the industry's heavy side, given the low price of products compared with their chemical/physical properties. Aging populations could reduce demand in developed economies, but infrastructure spending mitigates this risk. Demographic growth is a source of additional demand in emerging markets.

Moderate Risk	Business and Consumer Services
Key Issue: Companies handling sensitive data are exposed to potential credit-negative events such as cyber-attacks and mismanagement of personal data Total Debt: $1568 billion	Services companies are exposed to data privacy risks in the event of cyber-attacks or information mismanagement because they transact with large amounts of personal electronic data, including driver's licenses, social security numbers, credit card numbers and addresses. However, investment in data protection tools, secure processes and defenses against hackers can mitigate this risk. Data breaches can give rise to 1) reputational issues, affecting customer retention and new customer growth; 2) increased operational costs to mitigate cyber-attacks and reduce exposure to loss of private data; and 3) litigation liabilities stemming from the mismanagement of personal data. Regulators could also impose more stringent requirements to prevent data leakage and increase operating costs. Services companies rely on technology to support the solutions and services they provide, and employ highly skilled programmers and other experts in certain technologies. However, competition for a workforce with these types of skills is high and could increase payroll costs in the long run. Companies providing technology-enabled services will benefit from new generations that continue to embrace technological disruption, while providers of business-to-business services will support increased productivity through technology.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Chemicals - Specialty

Key Issue:
Health and safety risk is very high because of the handling of hazardous materials and stringent regulations

Total Debt:
$399 billion

Specialty chemicals are moderately exposed to demographic and societal trends. Health and safety risk is very high because of the handling of hazardous materials during the production process and transportation, given their potential impact on human health. Government regulations are also stringent compared with other manufacturing industries because of specialty chemicals' significant impact on the environment. Weather events and plant outages can affect the production of specialty chemicals and the supply of chemicals intermediates.

Negative sentiment toward certain chemicals can result in production being suspended or projects being delayed or cancelled. Changing demographic and societal trends have only a gradual impact on specialty chemicals because of their often indispensable functional features in end-products and indirect contact with customers. Although environmental campaigns pose a threat to growth in demand for plastics, the light-weighting trend in the automotive industry in particular supports demand for specialty chemicals.

Recruiting and retaining chemical engineers is critical to developing specialty chemicals and protecting chemical formulation and technical knowhow. Customer relations are sticky because of the functional features of specialty chemicals in end-products and the lengthy product qualification process.

Moderate Risk — Collateralized Debt and Loan Obligations - Project Finance and Infrastructure Assets

Key Issue:
While concentration increases the sector's risk exposure, risk levels vary depending on the industry composition of the portfolios

Total Debt:
$6 billion

The sector's overall score reflects the weighted blend of the underlying collateral in existing project finance CDOs. Its significant exposure to project finance and infrastructure linked to higher-risk sectors such as power generation projects, regulated water and regulated utilities and networks poses a greater risk, mirroring underlying social concerns in these sectors. Transactions with a higher exposure to public private partnerships represent a lower risk because key project risks are typically identified and allocated upfront. The moderately concentrated nature of PF CDOs means such deals are more exposed to social risks than other types of CDOs.

Moderate Risk — Construction

Key Issue:
The sector's moderate overall exposure to social risks reflects its reliance on human capital and external supply chains, as well as health and safety risks

Total Debt:
$50 billion

Construction companies recruit and retain specialized talent, which is critical to completing projects on time and under budget, while also ensuring the health and safety of employees at high-risk work sites. However, these risk factors rarely result in pay disputes and industrial action. Most companies maintain constructive relationships with employees, while health and safety regulations and companies' desire to avoid potential regulatory, legal and reputational risks mitigate the risk of on-the-job accidents.

Companies require reliable supply chains and subcontractor relationships to avoid potential project delays, execution issues and cost overruns. Most projects are completed on time and within budget. However, engineering and construction companies experience project issues from time to time, particularly when entering new markets, and incur charges due to cost overruns. Most companies maintain adequate liquidity buffers to protect against project execution issues and ensure a project is delivered according to specifications.

PRIVATE SECTOR CATEGORIES

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PUBLIC SECTOR CATEGORIES

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Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Consumer Goods

Key Issue:
The most frequent transmission channel for social risks is reputational and mostly externally driven

Total Debt:
$557 billion

The main social risks that companies in the sector face relate to potential consumer activism and boycotts; a reliance on external supply chains (raw materials) that could be exposed to "responsible production" issues; and changing consumer preferences. Increasing efforts to collect customer information also expose companies to data security and customer privacy risks, though the data collected are usually not sensitive. Product disclosure and labelling may be relevant for food and over-the-counter (OTC) pharmaceutical producers. Human capital is not a significant risk, though large companies can face scrutiny over their diversity and inclusion policies. Health and safety risk is low or moderate across the sector.

Product quality is frequently a primary consideration, particularly in segments such as OTC products and infant nutrition/health products. There is also a focus on product sustainability and the sustainability of supply chain sources. Aging populations and changing consumer preferences drive changing demand in some segments, but companies can manage this risk by introducing new products that better reflect evolving consumer tastes.

Moderate Risk — Covered Bonds

Key Issue:
Covered bonds have a moderate overall exposure to social risks

Total Debt:
$2244 billion

Bank credit quality is the primary ratings driver for covered bonds, which are direct obligations of financial institutions and benefit from collateral in the form of a cover pool of loans, mostly residential mortgages. For banks, misconduct, poor handling of data security and customer privacy breaches are the most significant social risks, though banks' financial and operational flexibility and track record of adjusting to social issues limit the credit impact. Some social issues affecting a bank, such as the mis-selling of financial products linked to mortgage loans, could affect loans in the cover pool, and demographic trends could affect property values. Borrower protection legislation may affect underwriting and servicing in an economic downturn.

Moderate Risk — Environmental Services and Waste Management

Key Issue:
Social risks facing the environmental services and waste management industry are moderate overall

Total Debt:
$60 billion

Workforce management is becoming increasingly important as driver shortages affect the availability of waste-collection drivers. As companies convert to and maintain a higher percentage of automated trucks and trucks with compressed natural gas engines, the need for higher skilled mechanics has rapidly increased. Employees face the risk of exposure to harmful and/or hazardous waste. However, incidents are infrequent and mostly one-off, and there are strict external and internal controls and regulations in place to detect and avoid hazardous waste material. Although falling steadily, workers' compensation insurance/premiums will remain an integral aspect of risk management. While unionized labor can make up a meaningful percentage of the workforce, labor relations have historically been positive.

Companies use surety bonds, letters of credit and insurance policies to protect against potential environmental and financial damage, but reputational risk can be meaningful. Good community relations are critical, particularly relating to landfills. Waste generation/volumes correlate to population growth, and trends indicate no material changes in the amount of waste generated per person. Zero-waste initiatives could gain more traction and focus, reducing overall waste volumes, but this trend is likely to be slow-moving, giving companies sufficient time to adjust to industry conditions.

Waste services companies have made significant progress in transitioning to providing recycling services, rather than taking on commodity price risk selling recyclable materials post-collection and sorting. In waste-to-energy, companies will continue to collect and deliver these volumes, and in the case of some larger industry participants even have their own waste-to-energy facilities.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk	Life Insurance
Key Issue: Life insurers' primary exposure to social risks stems from their underwriting and distribution of insurance products Total Debt: $379 billion	Life insurance companies are highly regulated and provide the majority of their products through diverse distribution channels. Customer relations are important because of the sector's reliance on handling customer data and privacy. Human capital risks are potentially significant, primarily in respect of recruiting and retaining key employees. Demographic and societal trends, including longer lifespans and aging populations, will affect retirement and estate planning products, as well as the pricing of life and health risks as insurers manage mortality, longevity and morbidity risks. Societal trends could also limit insurers' ability to share adverse experience through higher premiums for holders of life and long-term care insurance policies. Digital innovations are disrupting distribution patterns for life insurers. Effects range from the underwriting process itself to how life insurance and retirement products are purchased.

Moderate Risk	Manufacturing
Key Issue: The manufacturing sector faces moderate social risks overall Total Debt: $1005 billion	While workers in certain hazardous industries face considerable potential health and safety risks, companies are seeking to reduce such risks in mature and, increasingly, emerging market production areas. A trend, particularly among larger and more visible companies, toward systems and engineering activities aims to reduce their exposure to labor availability, the vagaries of wage or benefit demands and/or legal issues associated with large workforces. A shrinking pool for more highly skilled workers such as engineers and welders is a concern for companies as they seek to keep pace with technological change. Most companies are business-to-business rather than consumer-facing, but remain exposed to reputational and potential operational risks associated with their products. If products have to be recalled or redesigned, the greatest risk typically lies in how the recall or redesign affects the industrial supply chain.

Moderate Risk	Mass Transit
Key Issue: Mass transit enterprises' exposure to social risks is moderate overall Total Debt: $167 billion	Deteriorating service levels can expose mass transit enterprises to customer relations risk, potentially driving passengers away and reducing fare revenue to the extent that passengers have other mobility options. The risk can be alleviated by capital and operational investments that improve service quality. Transits are labor-intensive operations and have growing pension and retiree healthcare liabilities that will increasingly pressure the balance sheets of some companies and compete with capital reinvestment. The scope, complexity and labor-intensiveness of mass transit operations, which include maintaining subway tunnels and platforms, rail yards and buses running on city streets, give rise to high health and safety risks that can drive labor and capital costs. Most companies are heavily subsidized by tax revenue that either explicitly backs their debt or supplements their operating revenue. Employment, wealth and population trends heavily influence companies' bottom lines.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Media & Broadcasting

Key Issue:
Changing consumer preferences are the main social risk facing media and broadcasting companies

Total Debt:
$506 billion

Evolving demographic and societal trends are the key risk facing companies in the media and broadcasting sector. An evolving ecosystem with newer disruptive distribution platforms is changing consumption behavior trends. The rise of new wireless communications technologies such as smartphones and tablets are driving changes and also influence consumer behavior and advertising. Over-the-top (OTT, internet streaming services) channels have broken television broadcasters' and cable networks' stronghold on distributing content, while digital advertising budgets now make up the majority of advertising budgets. Traditional networks and broadcast station owners are under pressure to consolidate to remain competitive in this changing landscape. They ultimately need to adapt their business models to their audience's new media consumption habits and improve their advertising offerings. New models, such as OTT players, face pressures due to competitive spending on content, the potential for high churn, and privacy concerns regarding data collection for more effective advertisement targeting.

Moderate Risk — Medical Products and Devices

Key Issue:
The global medical device sector is subject to moderate social risks

Total Debt:
$242 billion

Demographic trends are a key risk for medical devices manufacturers. While an aging population is positive for the sector, it also increases costs, with the result that payors (either government or commercial, depending on the market) pressure providers to reduce their prices. Pressure on hospitals and other healthcare providers will in turn translate into pricing pressure on medical products suppliers. Because consumers do not directly purchase most medical devices, efforts to rein in pharmaceutical and healthcare services have come into focus, but the impact on medical device companies has been more muted.

Medical device companies can be exposed to product safety and labeling risks when patients experience unanticipated adverse effects. Such situations can give rise to direct costs in the form of legal payments, as well as indirectly affect a company's reputation. However, this risk has largely been managed and contained, and the impact has been manageable. Device companies are subject to product safety litigation and recalls, as well as regulatory oversight of their manufacturing processes. Costs have been manageable for the companies involved in most cases.

Moderate Risk — Mining - Metals and Other Materials, excluding Coal

Key Issue:
Human capital risk is the main social risk facing companies in the mining sector

Total Debt:
$255 billion

The industry faces social and environmental risks, often interchangeably. Underground mining poses structural risks and there is elevated potential for injury. This is also the case for open pit mines, which can suffer pit wall collapses, though advances in technology and monitoring equipment have significantly improved information on potential ground shifts. Positive interaction with local communities and indigenous peoples is critical because mining is land-intensive and frequently conducted in remote regions, particularly given environmental concerns over factors including water supply.

Although the sector is exposed to labor unrest, incidents are company-specific. The supply chain is also exposed to the risk of temporary disruption, but incidents are company- or region-specific, and the product is available elsewhere to deliver to market. Supply chain concerns can be country-specific, for example in the Democratic Republic of the Congo, where illegal mining practices and artisanal mining are subject to increased scrutiny, while the London Metals Exchange has also announced that metals traded on the exchange must comply with OECD guidelines on responsible supply chains by 2022. Demographic and societal trends are unlikely to alter demand for metal, given the broad-based use of metals across most industries, the fact that many mines are located in poor countries, and increasing calls for the wealth generated by mining to be more broadly retained in the community or country concerned.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Oil & Gas - Independent Exploration & Production

Key Issue: Independent oil and gas exploration and production companies face a range of social issues in the communities in which they operate

Total Debt: $364 billion

In many areas such as the Permian Basin in West Texas or the Arctic, populations are sparse (and in the case of deepwater offshore locations non-existent) and community relations issues are immaterial for independent oil and gas companies. However, communities in several locations have sought to limit the industry's access to lands and place restrictions on nuisances that accompany the drilling of wells, such as noise, vibration, dust creation, vehicular movement, emissions and air quality, as well as strain on local infrastructure.

Recent legislative attempts in Colorado (signed into law) and California (introduced, defeated in committee), as well as fracking bans in a number of areas, have highlighted the challenges the industry faces in certain locations. Restrictions on land-use to protect water supplies, agriculture, wilderness and endangered wildlife, for example, can evolve over time and make land currently open to drilling off-limits. In general, however, the industry tends to navigate these risks satisfactorily. Jobs in the sector generally offer wages that are well-above average and oil and gas-producing companies often generate a large share of the tax base in the jurisdictions in which they operate. In many producing areas, these benefits will engender a positive opinion of the industry and the regulatory framework will be moderate. Many producers, including most large companies, operate in several basins across multiple states and countries, limiting the effect of strict regulation in any one region.

We expect global demand for oil to peak by 2040 and to gradually decline thereafter. National commitments made under the Paris Agreement may result in more stringent regulation and fiscal regimes, while consumer demand for cleaner power could accelerate more rapidly than forecast. Growing social awareness and political pressure over climate change could accelerate the energy transition, though the pace is currently limited by the lack of widespread availability of alternative clean fuels, particularly for petroleum. Even under an accelerated transition, we do not expect oil demand to crest until the 2030s, with demand for natural gas likely to grow well beyond then.

Moderate Risk — Oil & Gas - Integrated Oil Companies

Key Issue: Integrated oil and gas companies face a range of community relations and host-country issues

Total Debt: $721 billion

Because of the often dangerous conditions in which employees operate, oil companies have a high exposure to workplace health and safety regulation, with the result that they prioritize health and safety considerations. Despite some high-profile accidents, the industry has a better than average track record on serious accidents and fatalities compared with other heavy industries. Displacement of local populations due to development, particularly in less developed countries, can require compensation and investment in education and workforce programs to aid development.

Growing social awareness and political pressure over climate change could accelerate the energy transition, though the pace is currently limited by the lack of widespread availability of alternative clean fuels, particularly for petroleum.

Moderate Risk — Oil & Gas - Midstream Energy

Key Issue: Event risk surrounding community relations issues involving land use, permits, displacement and climate-change activism has increased for pipeline companies following several high-profile incidents

Total Debt: $358 billion

As the link between oil and gas producers and downstream participants such as refiners, electric utilities and local distribution companies, midstream companies have traditionally operated with relatively little consumer awareness. Companies in the sector typically lack a retail arm or known brand, contributing to their relative anonymity among the general public and limiting the sector's social risk exposure. In recent years, a number of high-profile pipeline projects (for example, Keystone, Dakota Access, Rover and Trans Mountain) have encountered strong opposition from a variety of constituencies, including local communities, climate activists, regulators and indigenous populations. In some cases, institutions funding such projects have come under pressure to withdraw and/or stop lending to pipeline projects. Although newsworthy, such actions have affected only a very small percentage of the midstream sector and been confined to long-haul pipelines. The midstream sector comprises several activities, including long-haul transportation, gathering, processing, fractionation, terminaling, storage and distribution. The explosive nature of the products being conveyed means that companies need to exercise heightened vigilance to protect the safety of the communities in which they operate. While rare, equipment failures can result in large explosions and accompanying fatalities. Midstream companies continuously monitor their lines to prevent accidents occurring.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Oil & Gas - Oilfield Services

Key Issue:
Health and safety concerns stand out among otherwise low social risks facing the oilfield services sector

Total Debt:
$145 billion

Health and safety issues are the most significant social risks that oilfield service (OFS) companies face. The most likely time for a serious accident at a wellsite is when the well is being drilled and completed, which are activities that OFS companies perform, and the sector is consequently subject to substantial health and safety regulation. Levels of non-compliance are low overall and OFS companies prioritize worker health and safety, with the result that serious accidents and fatalities are lower than for heavy industries overall.

Site development and drilling and the completion of wells can give rise to public nuisances such as noise, odor, vibration, dust, increased road burden and air quality, while equipment movement and supporting services such as water-handling can strain roads and local infrastructure. Poor performance in these facets of the business can cause reputational damage and affect service providers' prospects. However, the long-term community relationship typically resides with the contractor who owns the lease, secures the permits and will operate the wellsite for many years to come.

Growing social awareness and political pressure over climate change could accelerate the energy transition. Although the oil and gas industry faces a long-term threat from carbon transition, this is a second-order effect for OFS companies. Peak demand for oil is not expected until at least 2035, and well beyond that for natural gas. Once the peak is reached, continued drilling will be necessary, along with maintaining producing wells, to stem natural production declines. Service companies are typically not tied to a specific region, and can relocate equipment and operations to areas offering the best opportunities, allowing OFS companies to remain competitive even after demand for oil and gas peaks.

Moderate Risk — Oil & Gas - Refining & Marketing

Key Issue:
Petroleum refiners can affect the communities in which they operate in the form of air and water pollution and reduced property values, among others

Total Debt:
$78 billion

Refineries can place a burden on the communities in which they operate in the form of emissions, air and water quality, reduced land values, and strain on local roads and infrastructure. Labor issues are prominent for refiners. Many refineries have unionized work forces, which adds a layer of complexity to negotiating wages and workplace conditions. Employee health and safety considerations are significant given the presence of combustible materials and the nature of the processes used to refine petroleum. However, refineries also provide a significant amount of relatively well-paying jobs and are often major contributors to the local tax base in which they operate. These positive attributes tend to ameliorate the adverse effects a refinery can have on a community and provide the basis for a satisfactory relationship with local residents.

Growing social awareness and political pressure over climate change could accelerate the energy transition, reducing demand for transportation fuels in the longer term.

Moderate Risk — Packaging Manufacturers: Metal, Glass, and Plastics

Key Issue:
The sector faces an overall moderate level of social risk, driven by moderate health and safety risks

Total Debt:
$104 billion

Customer relations risk is low because of the industry's business model of manufacturing to given specifications. Although the design may disclose customer marketing and other strategic information, disclosure is limited and the information is not accessible online.

While current negative sentiment towards plastic packaging raises the possibility of fallout for packaging manufacturers, the risk is low because consumer products companies decide the substrates and are usually the focus of consumer campaigns. Human capital risk is also low, reflecting the sector's low level of unionization and companies' generally good relations with active unions. Low human capital risk also reflects that most plants are located in rural areas, as well as a lack of alternative local employment. Most employees require only a low level of technical or other training.

Moderate health and safety risk reflects common risks in a manufacturing environment, offset by a lack of exposure to toxic substances or dangerous processes. The level of risk also reflects US Occupational Safety and Health Administration regulations, to which all manufacturers are subject. Responsible production risk is moderate because of the current focus on the sustainability of plastic packaging and volatility in resin prices. Demographic and societal trends risk is high because of the current focus on plastic packaging. Demographic trends represent a moderate risk because of the predominance of food and beverage packaging.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Paper and Forest Products

Key Issue:
Global paper and forest products companies face moderate social risks overall

Total Debt:
$73 billion

We have set the sector's overall social risks score at “moderate” rather than “low” to reflect our view that, as a manufacturing-intensive industry, companies are more exposed to human capital, health and safety and responsible production risks than companies in the services industry. Because other businesses are typically the direct customers, most paper and forest products companies are not notably vulnerable to risks associated with product disclosure and labelling, or risks associated with maintaining a high level of personal and/or confidential information.

Most companies have moderate exposure to labor relations and health and safety risks at their timberlands or manufacturing facilities. Rules, regulations and certifications are in place at the majority of mills to protect employees and contractors. Health and safety risks are unlikely to materially affect companies' overall credit quality as most rated companies have have incorporated health and safety compliance into their operational planning and business models.

Good community relations are an important consideration because most mills are located in rural areas and can occasionally be a source of pollution and/or unpleasant odors. However, the fact that mills are often the only local employer means there is typically community pressure to support them and ensure they remain competitive. Some commodity paper companies continue to face the challenge of repurposing assets, as consumer preferences switch away from paper to digital alternatives. Although the industry is sensitive to socially driven policy agendas in respect of sustainability, most companies have committed to sustainable practices. Certain socially driven policies, such as reducing single-use plastic items, have benefited the industry, with its ability to supply paper-based alternatives.

Moderate Risk — Passenger Railways

Key Issue:
The sector’s moderate exposure to social risk mostly reflects high human capital risk and moderate demographic risk

Total Debt:
$81 billion

Passenger railways have high exposure to human capital risk because many employees are unionized, particularly in Europe. Because strikes can be very visible and effective, passenger railways are highly exposed to the risk of collective bargaining and industrial action, and strikes can have reputational and financial consequences. Human capital risk is higher in Europe than it is in Asia and Russia, where strikes are less common.

Operators in developed countries are not materially exposed to on-the-job health and safety issues because the sector is generally subject to regulatory oversight and quality standards. However, employees working directly on operational maintenance face a risk of electricity shocks, particularly in developing countries, where levels of regulatory oversight are lower. Extensive testing limits the risk of product (rolling stock) defects.

The increasing polarization of wealth and cost-consciousness are moderate risks for passenger railways. While operators need to adapt their offer to include low-cost trains, which generate lower margins, they face increasing competition from low-cost airlines, long-distance buses and car-sharing. Demographic changes, particularly urbanization, could affect the distribution of rail traffic across countries, which could in turn lead to incremental investment in urban areas and the need to operate unprofitable empty services in deserted rural areas. However, government intervention to subsidize non-profitable lines generally mitigates this risk.

The fact that railway operators often provide a public service exposes them to the socially driven policy agenda. Social policies usually support railway transport through ticket or capital expenditure subsidies to modernize fleets. However, they also expose operators to the risk of changes in government policies, which could increase capital expenditure and erode revenue.

Passenger railways have limited exposure to customer relations risk. Users generally perceive them as a more convenient and reliable means of transport than road or air travel, limiting the risk of customer boycotts.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

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DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Pension Funds

Key Issue:
Pension managers face moderate social risks overall, largely driven by their inherent susceptibility to demographic changes

Total Debt:
$125 billion

Funds' local beneficiary and government-sponsor constituents require continual assessment of their awareness in the community. Contributions fluctuate as the sponsor's underlying workforce changes, which may reflect demographic or social trends. Funds also face an aging demographic with a diminishing active to retired ratio. Activist pension members more recently have driven a more socially driven investment policy for pension management, and pension managers have sought to showcase their efforts in sustainable, environmental and responsible investment.

Professional investment management requires specialized talent, for which pension funds compete with other financial sectors such as banking and insurance. Management turnover tends to be higher than in other financial sectors because competition for talent is generally strong. Pension managers increasingly rely on other financial sectors for securities settlement and counterparty trades to manage risks in their investment portfolios, increasing the inherent risk in their supply chains.

Moderate Risk — Ports

Key Issue:
The main social risk that ports face relates to the socially driven policy agenda

Total Debt:
$32 billion

The very local nature of ports' operations exposes them to specific community relations risks, such as reducing emissions or community opposition to expansion. In addition, the physically intensive nature of work at ports causes physical wear and tear over time, limiting most workers' longevity, while also giving rise to a range of work-related health and safety regulations. Ports in some areas are exposed to social risks in the form of highly unionized and influential labor. They are also indirectly exposed to responsible production risk through customers who may be forced to reduce emissions, such as shipping lines, or as a result of changes to the scale of ships requiring investment by ports to accommodate them. Ports in developed countries support well-paying jobs, and actions to reduce jobs such as automation attract community attention. Demand for cargo is increasing as demographics change and more wealth is accumulated, though an aging population consuming less overall counterbalances this trend in some areas.

Ports only maintain key customer pricing and cargo information, which is important proprietary competitive information that is only useful to a limited number of companies. Most of the cargo information they handle consists of publicly available US customs information or a shipping bill of lading, which is generally publicly available. No personal data is stored because cruise lines manage their customers' data.

Moderate Risk — Power Generation Projects

Key Issue:
Social risks for power projects are moderate overall.

Total Debt:
$47 billion

A continuous ability to source fuel, changes in supply and demand, and markets' adaptation to technological shifts are pressures facing the sector. Socially driven policy agendas and observable changing consumer preferences based on increased environmental awareness will continue to affect credit quality in the medium term.

Community relations and engagement are important factors in obtaining permits for new developments. Factors with the potential to affect service quality and reliability include supply chain logistics such as transmission lines, gas pipelines and other fuel transportation. In addition to health and safety risks relating to maintaining heavy equipment and machinery, the sector also faces event risks with social risk repercussions, such as nuclear and hydropower disasters.

Social risks associated with workforce longevity, recruitment and retention are moderate overall, but can be higher in locations where there is a shortage of specialized labor or where expatriate labor is required in the initial stages. In some countries or regions with unionized workers or where utilities employ a large percentage of the workforce, there may be political pressure to keep certain assets operating.

Power projects may be less exposed to customer relations risks because of their single asset or smaller portfolio relative to larger unregulated utilities' higher exposure. While electricity providers are increasingly engaging in green labeling in response to changing consumer preferences and regulatory requirements, this is not viewed as a significant social risk to the extent of backlash due to false labeling.

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Moderate Risk — Property, Casualty and Reinsurance

Key Issue: The sector's primary exposure to social risks stems from underwriting certain insurance products, though human capital risk is also significant

Total Debt: $217 billion

Property and casualty insurers and reinsurers have a moderate overall exposure to social risks. Companies are highly regulated and distribute most of their products through intermediaries. However, the sector's reliance on a highly trained, specialized workforce means that human capital risks, primarily relating to recruiting and retaining key employees, can be significant.

Property and casualty insurers and reinsurers are exposed to various social risks through their underwriting of certain insurance products, where claims can arise as a result of industrial accidents, health and safety incidents, product recalls and a wide range of liability claims against corporations. Although these risks are factored into the price of insurance policies, the ultimate level of claims arising under such policies is often not known for many years.

Moderate Risk — Protein and Agriculture

Key Issue: Companies in the protein and agriculture sector face moderate social risks overall

Total Debt: $59 billion

Customers relations risk is low because companies have very limited direct relationships with customers, but consumer interest in where food originates and how it is produced is increasing. The sectors may be subject to labeling and disclosure requirements, as well as boycotts and activism. However, these are usually point-in-time occurrences and have only a limited impact on an issuer's credit quality.

While human capital risk varies across regions and segments, the agriculture and protein sectors are labor-intensive overall. Another relevant social risk factor is the employment of immigrant or low-skilled, low-wage workers in agriculture, slaughterhouses and meat-processing plants. Farmworkers face a high risk of fatality and injury, work-related lung diseases, noise-induced hearing loss, skin diseases and certain cancers associated with chemical use and prolonged exposure to the sun.

Although increased scrutiny of product quality and exposure to external supply chains can heighten social risks, agriculture and protein companies focus on the responsible supply chain. The protein industry faces the risk of opposition to the operation of slaughterhouses and meat-processing plants close to communities. Changing consumer patterns such as veganism and vegetarianism are incipient and have had a very limited impact on the protein industry.

Demographic trends are more favorable to the agriculture and protein industry globally. The political agenda mostly focuses on health and safety concerns, and targets the sustainable production of agriculture and protein products, particularly in developed countries.

Moderate Risk — Public Sector Housing

Key Issue: The sector has a high exposure to socially driven policy agendas in Europe, and demographic and societal trends in the US

Total Debt: $166 billion

The social housing sector in Europe is highly exposed to socially driven policy agendas, particularly those relating to income inequality and the affordability of social rents. Government-led policy in recent years has introduced cuts to social rents, restricting the operating margins of public sector housing companies. In the US, meanwhile, demographic and societal trends have a significant impact on public sector housing. Demand for single and multifamily loan products, as well as standalone military, student and affordable housing projects, reflects demographic and economic trends such as the rise of an aging, low-income population and demand from first-time millennial homebuyers. Customer relations and product quality can also affect public sector housing. Unhappy tenants can generate negative headlines, and in Europe can influence development permissions for new housing schemes.

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Moderate Risk — Publishing

Key Issue: Evolving demographic and societal trends and, to a lesser extent, responsible production, are the key social risks facing the publishing sector

Total Debt: $24 billion

The publishing sector faces moderate social credit risks overall. Technological advances such as the rise of the internet and new communications technologies, including smartphones and tablets, have favored changes in consumer preferences, particularly the manner in which people consume content, both in terms of news media and from an educational standpoint. Various social media content distribution and advertising platforms (such as Facebook, Twitter and Google) have also changed the way in which people seek and obtain information. The ability to digitally self-publish has effectively devalued created content, challenging the traditional publisher content distribution model.

A migration toward digital learning in the education sector has been both a response to disintermediation in content acquisition and a strategy to protect copyrighted content and ensure distribution only to authorized users. However, it is still subject to competition from pure-digital new entrants to the education publishing market.

Education and news publishers are under increasing pressure to ensure accuracy in respect of sourcing, as well as accommodate the interests of their readership or the educational community. As their online readership grows, news publishers are seeking to monetize their investments in online platforms through subscriptions and/or online advertisements, or designing digital advertising campaigns on behalf of community business partners.

Moderate Risk — Regional and Local Governments - Advanced Economies

Key Issue: Advanced economy regional and local governments' vulnerability to social risks is moderate overall, but there are significant variations between countries, regions and local governments.

Total Debt: $3956 billion

Advanced economy regional and local governments are exposed to demographic risks as their populations age. Such risks can slow economic growth and increase demand for services, resulting in less dynamic fiscal revenue, increased social expenditure and unfunded pension liabilities. These pressures will build in the medium to long term for most countries. However, pension responsibilities tend to lie more at the sovereign level and equalization measures can mean that the exposure and effects of demographics may be less immediate for regional and local governments. Within the same time frame, poor employment growth prospects and labor participation may also pressure advanced economy RLGs' finances, particularly where the working-age population is contracting, along with high levels of income inequality and pressure on housing affordability. In some countries, the central government plays a significant role in mitigating some of these pressures. While such risks can be material to credit quality in the medium to long term, they are likely to be broadly manageable in the short term. Advanced economy RLGs can mitigate some of the effects because their economies are relatively wealthy and diverse, providing fiscal flexibility.

Moderate Risk — Regulated Electric and Gas Networks/Utilities with no Generation

Key Issue: Overall social risk is moderate, but customer relations risk is high

Total Debt: $467 billion

Risks related to product disclosure and labeling are low, with the exception of green electricity. There is a moderate risk of boycotts and customer activism in the form of objections to pipelines and transmission lines, as well as social implications as a result of rate increases. Human capital risk is moderate, as is labor relations risk. Although the sector is heavily unionized, this has not been an issue for utility companies. Labor retention risk is moderate because utility skills are generally not difficult to acquire, though nuclear plants require specialized skills and the workforce is aging. In common with other sectors, white males dominate management, though the sector has largely avoided lawsuits or controversies to date.

Working with gas and electricity can be dangerous, and there have been regular injuries and fatalities. Ongoing health issues are moderate because exposure to an industrial environment can affect human health over time. Government regulations in respect of worker health and safety are extensive, while the safety and reliability of utility services are very important to customers. Supply chain risk is moderate because companies depend on fuel supplies and natural resources, as well as suppliers of equipment such as transformers. Maintaining good customer relationships is important to utilities because this affects how the public perceive them, as well as the regulatory treatment they receive. Demand for distributed generation and renewable energy is increasing, while the younger generation is more attuned to demand response technology and clean energy. Social policy agenda risk is moderate because energy policy initiatives are often implemented through utility operations.

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Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Regulated Electric and Gas Utilities with Generation

Key Issue: Sector's moderate risk score driven by exposures to health and safety, customer relations and demographic and societal trends

Total Debt: $851 billion

Customer relations exposure is moderate. Maintaining good customer relationships is important to utilities because this affects how the public perceive them, as well as the regulatory treatment they receive. Reliance on interconnected technology and confidential information is also high, while companies have high potential exposure to cyber risk. Risks related to product disclosure and labeling are low, with the exception of green electricity.

There is a moderate risk of boycotts and customer activism in the form of objections to pipelines and transmission lines, as well as social implications as a result of rate increases. Human capital risk is moderate, as is labor relations risk. The sector is heavily unionized, though this has not been an issue for utility companies. Labor retention risk is moderate because utility skills are generally not difficult to acquire, though nuclear plants require specialized skills and the workforce is aging. In common with other sectors, white males dominate management, though the sector has largely avoided lawsuits or controversies to date.

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Moderate Risk — Residential Mortgage Backed Securities

Key Issue: Mortgage loans securitized in RMBS transactions are moderately exposed to demographic and societal trends

Total Debt: $2821 billion

Changing demographic trends such as aging, urbanization, population declines and ways of living trends in general have different consequences from the demand side in the mortgage market. For example, an aging “baby boomer” generation would likely increase demand for reverse mortgages, while millennials choosing to rent rather than own, or vice versa, would affect demand for single-family rentals, with implications for credit quality. Social issues have been very present in the political agenda related to housing and consumer protection, particularly in down cycles. Borrower-friendly legislation in reaction to such cycles can affect both the underwriting and the servicing of mortgage loans being securitized. Decisions driven by social policy, such as reducing underwriting standards at government-sponsored enterprises to increase home ownership, would reduce the credit quality of RMBS. In addition, a push to ease credit to lower-income borrowers could result in the acceptance of credit score methodologies that allow scores for borrowers without significant credit history, potentially reducing the credit quality of certain types of loans. Factors related to confidentiality and data protection in general may also pose a moderate risk.

Moderate Risk — Restaurants

Key Issue: Social risks are moderate for restaurants overall, with high exposure to responsible production and demographic and societal trends

Total Debt: $101 billion

The restaurant sector has moderate exposure to social risks overall. In respect of customer relations risk, information gathered is generally limited to credit card information and a large part of the industry is cash-based. While nutritional information is required in some US states, mislabeling in respect of allergens is the main risk restaurants face. Protests and boycotts, while not uncommon, mostly focus on a specific brand.

While personnel turnover is high, the amount of training workers require is limited, though recruitment is a key problem. In addition, while the workforce is mostly not unionized, there is significant momentum toward higher wages, and most companies are voluntarily increasing wages and incentives. Higher wages affect company margins, though technology and greater efficiencies mitigate the impact. Although the sector is subject to wide-ranging regulations and safety requirements, most focus on public health safety (contaminated food). Slips, falls, cuts and burns are the main safety hazards for personnel. Food safety concerns relate to the contamination of products in the supply chain. Despite a greater focus on healthy eating, companies overall have sufficient time to address and adjust to such changes.

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Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk — Retail and Apparel

Key Issue:
Social risks for the retail and apparel industry are moderate overall

Total Debt:
$591 billion

The rise of e-commerce implies the growing use of big data and customer data, which can give rise to privacy and legal issues. Changes in customer behavior, notably the shift to online, are challenges for incumbent retailers, whose market shares are eroding and whose margins are under pressure because of high fixed costs. Increased social media use among millennials is a challenge for fashion retailers in terms of customer loyalty and brand image. While concerns over sustainability issues such as environmental impact and the treatment of workers may not translate into negative credit rating actions, retailers will seek to improve their brand image, sourcing transparency and investment in sustainable supply chains. Retailers' heavy reliance on external suppliers implies responsible sourcing risks. While news of poor responsible sourcing practices can result in weaker demand or consumer boycotts, they tend to have little long-term effect on consumer behaviour, which underpins the credit quality of retail and apparel companies.

Moderate Risk — Shipping

Key Issue:
Data protection, health and safety and labor relations are among the main social risks facing the shipping industry

Total Debt:
$22 billion

Data security concerns were brought into stark relief in 2017 by a cyber-attack on a number of large corporates including Maersk. While customer data did not appear to be compromised, Maersk's operations were disrupted, resulting in both a financial impact (approximately $300 million) and reputational damage. Labor relations are important for the shipping industry because many port employees, who are key to smooth and efficient loading and unloading processes, are unionized.

While company employees are not affected, strikes at ports can have implications for efficiency, capacity utilization and, ultimately, companies' bottom line. Health and safety measures are significant, particularly in industry segments transporting flammable, toxic (oil and oil products) and otherwise dangerous materials. The industry is also subject to accidents such as vessel fires and pirate attacks. Shippers typically carry appropriate insurance.

Moderate Risk — Sovereign Advanced Economies

Key Issue:
Advanced economy sovereigns' exposure to social risks is moderate overall, but can vary significantly across regions and countries.

Total Debt:
$31157 billion

Aging populations and the resulting fiscal and economic impact are the major social credit risks that developed nations face. An aging society that reduces the overall working-age population can reduce economic growth and increase fiscal pressure as revenue falls and aging-related expenditure rises. The risk is greatest in Japan and certain European countries: other advanced economies, such as the US and Canada, still benefit from higher fertility rates. Income inequality and labor-related challenges are other credit concerns for advanced economies. Income inequality is associated with lower and less stable economic growth, higher levels of corruption, increased demands for additional fiscal spending and greater political unrest. Education, housing, health and safety, and basic services all present low risks for developed sovereigns.

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Icon color key: Very high | High | Moderate | Consistently low

Moderate Risk	Steel
Key Issue: The social risks facing the steel industry vary on a country-by-country basis, but are moderate overall Total Debt: $79 billion	Steel is produced in either blast or electric arc furnaces, and the metallurgical specifications for all its products are well identified. As a result, the industry is not prone to product recall or marketing or disclosure issues. We do not see a meaningful threat of demand substitution for most steel applications beyond those already in play. Building construction, which is the largest steel end-market, will continue to require steel even if regulation increases. In addition, while the auto industry increasingly uses aluminum for body-in-white and other automotive components, auto-grade aluminum capacity is limited and the process of creating aluminum-mining bauxite, processing the bauxite to make alumina and smelting the alumina to make aluminum is highly carbon-intensive. The industry faces health and safety risks because it uses heavy equipment and high heat furnaces, for example. Unlike the coal industry, however, health issues such as Black Lung or those associated with asbestos are not present to the same degree. Regulatory requirements and supervision are significant, particularly in developed countries, and are increasing in other countries. Because steel is not easily replaced, particularly in industries such as construction, more likely areas of risk are the increase in battery electric vehicles, population migration to more urban areas and ride-sharing, reducing the need for automobiles. While external supply change disruptions occur, these tend to be company- or weather-specific and other necessary inputs exist globally, though prices may spike temporarily. The nature of steel production from a community relations perspective is an environmental issue to a greater extent. Even here, however, there has been a significant effort to reduce pollution and emissions, though the carbon transition remains a key risk for the industry.

Moderate Risk	Telecommunications
Key Issue: The global telecoms service provider sector is exposed to moderate social risks overall Total Debt: $1207 billion	The global telecoms sector is capital intensive, relies on changing technology and is exposed to intense labor needs with changing skill profiles. This implies ongoing employee restructuring processes, which in some countries could give rise to employee unrest. Demand for services is high, and customers require increasing speed, network capacity and security as demand for data and video grows exponentially. The industry is highly regulated, but there are no relevant litigation issues. Governments are increasingly demanding greater investment in infrastructure and competitive intensity to maintain price competition. Social-related risks are moderate, though this could change as the industry evolves. The sector is exposed to continued restructuring efforts as a result of pressure on revenue. Technological innovations make operations more efficient, provide opportunities to automate (digitalization) and ultimately reduce the need for headcount. Incumbents are in permanent restructuring mode and challengers have much leaner workforces. Potential health concerns, related to wireless radio emissions, could constrain the construction of new towers. However, these pose a medium-term rather than an imminent risk.

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Low Risk	Airports
Key Issue: Airports face potential community relations challenges as they expand, but their strategic importance to local communities mitigates overall exposure Total Debt: $175 billion	Community relations connected to expansion are the primary social risk that airports face, though reduced demand in some regions as a result of changing demographics mitigates this risk to an extent. There are regional concentrations of high-risk areas, for example in Australia and the EMEA region, where airports are seeking to expand in urban areas and face community opposition and political interference. However, they generally face low social risks because airports are widely needed and help drive economic growth, particularly as incomes rise. Direct labor risks are limited with the exception of air traffic controllers, whose services are more specialized. Airports' monopolistic position and importance to regional economies mean they are generally able to manage local risks. Although most airports do not store personal user information, some maintain personal user data and face the risk of a breach if their systems are hacked. Indirect risks relate to airlines scaling back their number of flights from an airport. Aging populations can be a drag on growth in some regions, but increasing wealth and demand for travel in emerging markets counter-balance this risk.

Low Risk	Asset Backed Securities - Auto Loans, Auto Leases, Floorplan, Car & Truck Rental
Key Issue: Auto-backed loans and leases securitized in auto ABS are largely decoupled from considerations affecting the sector, but have some exposure to customer relations risks Total Debt: $327 billion	Technological obsolescence, shifting demand patterns and changes in government policy mean that some segments will experience greater volatility in recovery levels and residual values than has historically been the case. In addition, the increasing popularity of alternative fuel vehicles (AFVs) has introduced some uncertainty in respect of future price trends for both legacy engine types and AFVs because of technological evolutions and government incentives. The fact that auto finance companies typically hold confidential personal information could give rise to customer privacy risk in the event of a data security breach. While most transactions are backed by originations of captive finance companies with oversight of the dealer network, finance companies in markets such as the US also originate indirect loans to nonprime borrowers through their relationships with franchise and independent dealers, potentially generating limited responsible production risk. In addition, the demographic attributes of underlying loan borrowers, such as a younger population more amenable to leveraging credit but whose repayment ability remains untested, may change in some jurisdictions.

Low Risk	Asset Backed Securities - Credit Cards
Key Issue: Data security and customer privacy risk are challenges for credit card ABS Total Debt: $101 billion	Customer relations risk stems from high interest rates, data security and customer privacy risk, though lenders are investing heavily in cyber-security. Although credit cards could fall out of favor as alternative payment methods such as mobile and online payments become more popular, they have retained their relevance to date.

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Low Risk	Asset Backed Securities - Wireless Towers
Key Issue: Social and demographic trends are generally positive for wireless tower ABS, but potential or perceived health risks could influence policies and community activism Total Debt: $10 billion	Wireless data consumption is growing robustly as the use of mobile devices increases, raising the value of the collateral as wireless carriers expand their network coverage and capacity by placing more equipment on towers. Towers are an important component of wireless communication infrastructure, though the underlying collateral mostly consists of simple metal structures. The fact that tower operators' customers are mainly large wireless carriers limits transactions' exposure to customer relations risk. Potential or perceived health risks could influence policies and community activism in the long term.

Low Risk	Collateralized Debt and Loan Obligations
Key Issue: Social risks are low because of the diversified nature of the collateral backing CDO/CLO transactions Total Debt: $545 billion	While some transactions may have a higher collateral concentration in industries and companies with greater exposure to social risks than others, the single industry and company exposures in CDO and CLO transactions are still relatively low (the largest single industry exposures are typically 10%-15%, and the largest typical single issuer exposures typically 2.0%-2.5%). The overall sector risk score is low and such risks are not material to our credit ratings.

Low Risk	Commercial Mortgage Backed Securities
Key Issue: Demographic and societal trends are the main social risk facing CMBS Total Debt: $395 billion	Externally driven demographic trends and societal preferences are the main social considerations affecting credit, and generally affect the operations of building owners in respect of demand for space. The most notable shifts have come in mature markets such as the US, such as the shift in retail shopping preferences online and the impact on office building use of long-term trends such as flexible/remote-working, greater amounts of shared office space, and a limited but increasing amount of co-working space. Technological advances such as artificial intelligence and augmented reality are likely to support these trends. Demographic shifts will continue to affect demand for commercial real estate at the regional level. The most significant trends are the growing preference for renting over homeownership, urbanization, and the migration of an aging and retiring population. As the wealth and income gap continues to grow, local governments and regulatory agencies are likely to address housing affordability through incentive systems such as "smart zoning" and new tax benefits for affordable housing construction, as well as penalties such as rent control.

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Low Risk	Distribution and Supply Chain Services
Key Issue: Most distribution and supply chain services issuers have limited direct consumer exposure, contributing to low social risk overall Total Debt: $100 billion	Most distribution and supply chain services issuers have limited direct consumer exposure because of their business-to-business focus, which contributes to an overall low level of social risk. Certain industries such as chemicals face moderate risks relating to regulation, while some companies in the groceries sector have workforces with union representation. Other social risks are generally low. Changing consumer preferences can increase or reduce volumes of a product being shipped, but diversified distributors are generally able to shift capacity to maintain revenue and mitigate the credit impact.

Low Risk	Equipment and Transportation Rentals
Key Issue: Companies face limited social risks that could be material to their ratings Total Debt: $51 billion	A provider's reputation is key in terms of hands-on customer service, possessing the right quality equipment, keeping the equipment in good condition and providing it when needed. Although companies serve a wide range of customers with information on types of work that could be compromised, the sector is not heavily technology-dependent. However, companies rely on a range of suppliers and a manufacturer's failure to perform is a critical risk. If a company depends on a supplier to provide a specific piece of equipment and that supplier has an issue, the company could be exposed to reputational risk. Operational risk could arise if the company cannot obtain the same piece of equipment from an alternative supplier.

Low Risk	Financial Guarantors
Key Issue: The sector's primary exposure is to human capital risk because it relies on a highly specialized workforce Total Debt: $4 billion	Financial guarantors' exposure to social risks is low overall. Sophisticated counterparties purchase products, mitigating customer relations issues. However, the sector's reliance on a highly trained and specialized workforce means that human capital risks can be significant, primarily in respect of recruiting and retaining key employees. Financial guarantors also have a long-term exposure to US municipal issuers that could be affected by demographic and societal trends, such as the rising unfunded pension obligations of an aging workforce. However, significant single-name and geographic diversification and the amortization of their insured portfolios over time mitigate the credit impact for guarantors.

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Low Risk	Homebuilding and Property Development
Key Issue: The sector faces low social risks overall Total Debt: $154 billion	Population growth, demographic changes and affordability are important factors driving demand, and changes in these areas could moderately affect the risks that property developers face. Human capital is generally not a major risk in emerging markets, where labor costs are low and the labor pool is large, but a shortage of skilled labor will constrain supply, particularly in developed markets such as the US and Europe. Developers are exposed to accident and safety issues at construction sites, though related compensation is generally not substantial relative to operations. Companies possess a large amount of customer information, exposing them to data security and customer privacy risks. Many US homebuilders have financial services divisions that originate mortgage loans and hold sensitive financial information on homebuyers.

Low Risk	Mortgage Insurance
Key Issue: Exposure to social risks arises from policies covering payment default risks, mostly for residential mortgages and the underwriting of certain insurance products Total Debt: $5 billion	Mortgage insurers' exposure to social risks is low overall. Their primary exposure is to a US housing sector exposed to demographic and societal trends, though market diversification mitigates this risk. Customer relations are important because mortgage insurers are highly regulated and rely on their handling of customer data and privacy. Human capital risks are potentially significant and mainly relate to recruiting and retaining key employees. Changes to regulatory rules and practices within a market, as well as potential changes to regulation or the taxation of products, could affect the benefits of mortgage insurance as a credit enhancement or result in industry segments being restructured.

Low Risk	Privately Financed Public Infrastructure Projects (PPPs)
Key Issue: While upfront risk allocation reduces exposure, the sector is nonetheless exposed to issues relating to community engagement and sensitivity to the socially driven policy agenda Total Debt: $42 billion	The sector's broad nature means that different types of projects may have different exposures to some of the macro drivers of social risk. A project agreement is typically entered into between the public party and the private party, and identifies/allocates the key project risks and unknown items upfront. These provisions mitigate public-private partnerships' (PPPs) exposure to certain human capital risks, though different provisions can apply depending on the jurisdiction concerned, resulting in different risk exposures. Project companies' key construction and operational responsibilities are typically passed on to third parties on a "turnkey" and fixed-price basis, substantially insulating the projects from key risks and complexities. As such, PPPs are sensitive to the performance and quality of the operators/subcontractors. The public nature of the assets being constructed and operated by PPPs means that the sector is exposed to potential community engagement issues and somewhat sensitive to the socially driven policy agenda, which varies depending on the country. For example, the opposition Labour Party in the UK has proposed nationalizing PPPs as part of plans to reduce the private sector's involvement in public services. However, contractual provisions requiring the public sector to repay the debt in full where a project agreement is terminated and the project company has not defaulted mitigate credit risk. The sector's low social risk scores reflect that most of the issuers we rate are based in countries whose institutional strength we assess as strong.

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PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Low Risk — Real Estate Trusts & Other Commercial Property Firms

Key Issue:
Externally driven demographic trends and societal preferences are the main social considerations affecting credit, with the exception of US prison REITS

Total Debt:
$417 billion

Demographic shifts will continue to affect demand for commercial real estate at the regional level. The most notable trends are a moderate shift in preference toward renting over home ownership, urbanization and the migration of an aging and retiring population. Our ratings for prison REITs incorporate the potential for adverse policy actions and prevailing negative investor sentiment toward the private prison business model, though drastic changes to regulation and criminal justice reform could meaningfully alter the economics for private prison landlords.

The industry's social license to operate is broadly governed by legislation such as zoning requirements for the use of real property, and zoning is generally resistant and slow to change. Notably, existing properties have generally grandfathered use. As the wealth and income gap continues to widen, local governments and regulatory agencies are likely to address housing affordability through incentive systems such as "smart zoning" and new tax benefits for affordable housing construction, as well as penalties such as rent control.

Low Risk — US Municipal Utilities, Water and Wastewater, and State Revolving Funds

Key Issue:
The overall factor score of “Low" accounts for mitigants and the potential impact on credit. All sub-factors are analyzed as nominal exposure

Total Debt:
$363 billion

Overall social and customer relations risks are moderate. Interconnected technology and companies’ holding of personal confidential information and usage patterns means that their potential exposure to cyber risk is high. Labor relations risk is moderate because the sector is heavily unionized, though labor activism has generally not been a problem overall. Labor retention risk is moderate, reflecting that utility skills are generally not difficult to acquire. White males dominate senior positions in the water sector, in common with other sectors, though the sector has largely avoided lawsuits and controversies to date. On-the-job safety risk is moderate, though exposure to an industrial environment can affect workers’ health over time. Government health and safety regulations are extensive. Product quality is high, and the safety and reliability of utility services are very important to customers. Supply chain risk is low. Community relations risk is moderate, reflecting the importance of maintaining good customer relationships from both a reputational and regulatory perspective. With respect to social policies, energy policy initiatives are often implemented through utility operations.

Low Risk — Securities Industry and Financial Intermediaries

Key Issue:
The sector faces low social risks because customers are generally other financial and nonfinancial institutions

Total Debt:
$190 billion

Companies in the sector do not produce tangible physical products that could give rise to responsible production issues or employee health and safety risks. They also employ relatively higher-skilled personnel, and there are no significant labor-relations issues. Firms with retail customers may have moderate risks associated with data security and customer privacy because they may have access to large amounts of their customers’ personal data and are more prone to cyber-attacks. This risk is partly mitigated by sizeable technology investments and a long track record of appropriately handling sensitive client data. Fines and reputational damage due to product mis-selling or other types of mis-conduct may also be important considerations.

PRIVATE SECTOR CATEGORIES

RESPONSIBLE PRODUCTION | HEALTH & SAFETY | DEMOGRAPHIC & SOCIAL TRENDS | CUSTOMER RELATIONS | HUMAN CAPITAL

PUBLIC SECTOR CATEGORIES

DEMOGRAPHICS | HEALTH & SAFETY | EDUCATION | HOUSING | LABOR & INCOME | ACCESS TO BASIC SERVICES

Icon color key: Very high | High | Moderate | Consistently low

Low Risk	Semiconductors & Technology Hardware
Key Issue: The sector has very limited exposure to social risks Total Debt: $521 billion	Companies in the semiconductor and diversified technology hardware sector have very little direct consumer exposure, and have low exposure to social risks overall.

Low Risk	Surface Transportation and Logistics
Key Issue: Surface transportation and logistics companies face low social risks overall Total Debt: $251 billion	Although the sector faces low social risks overall, these risks could be considered moderate if greater weight is given to the risk of industrial accidents and the impact on certain freight groups as environmental awareness increases. Social risks include health and safety issues relating to the operation of heavy machinery, and health and safety regulations are in place to protect employees against such risks. While a number of companies are subject to collective bargaining agreements, industrial action is neither frequent nor protracted, though a persistent shortage of truck drivers in the US is putting upward pressure on wages. There remains a risk of industrial accidents (derailments), such as the fatal derailment of oil tank cars at Lac-Megantic in Canada in 2013. Other social risks stem from indirect exposure to changing consumer behavior patterns as consumers become more environmentally aware. We consider such risks to be moderate but manageable at this stage.

Low Risk	Title and Trade Credit Insurance
Key Issue: Social risks such as changing consumer preferences are prevalent in many of the underlying sectors that trade credit insurers cover Total Debt: $3 billion	Trade credit insurers are exposed to social risks, both through their own operations and through the insurance exposures they underwrite for debtors in a wide variety of industries. Trade credit is a highly specialized and relatively niche business that requires the ability to assess the credit risk of individual companies across the globe, driving the need to recruit and retain specialized skills. Social pressures affecting the wide variety of sectors that use trade credit insurance have an impact on credit insurers, but the impact is low because of the exposures' short-term nature and extensive diversification. Title insurers are exposed to a high level of political and legal scrutiny, particularly around the pricing of their products, because of their consumer orientation and links to real estate. Increasing trade tensions affecting global trade volumes will affect credit insurers, but not to an unexpected extent within the normal cyclical nature of the business.

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Low Risk — Toll Roads

Key Issue:
The toll roads sector has low exposure to social risks overall

Total Debt:
$214 billion

Traffic volumes are a key revenue driver for issuers and fundamentally linked to macroeconomic trends and business sentiment. More broadly, they are influenced by demographic and societal trends, as well as consumers' mobility preferences. Concession contracts in some jurisdictions include rebalancing provisions under which issuers are entitled to compensation if actual traffic falls below expectations.

Community relations and sensitivity to the socially driven policy agenda are potential channels for social risk, though issuers' exposure can vary depending on geography. In particular, issuers are exposed to the risk of political interference in the toll-setting process, though the fact that tariff-adjustment formulas and procedures are usually contractually agreed with grantors in the concession agreements partly mitigates this risk. In some jurisdictions, multi-year toll increases have been approved by legislation. The overall risk of political interference is heightened during election cycles.

The sector is exposed to customer activism in the form of potential reductions in traffic in response to toll increases. This risk is partly mitigated by the fact that toll roads managed by issuers are often strategic assets in terms of meeting users' mobility needs, and alternatives can be limited and/or more expensive.

Low Risk — Trading Companies

Key Issue:
The sector faces low social risks overall, and most risk factors have been well managed or not had a material impact on credit quality

Total Debt:
$84 billion

Customers relations risk is low because companies have very limited direct relationships with customers. Human capital risk varies across sectors, though the requirements for highly skilled individuals are low relative to the overall workforce.

The sector is not labor-intensive because technology has greatly reduced the manual labor needed to load and transport goods, while health and safety risk is relatively low. The process of loading and transporting commodities is highly automated, reducing injury rates and fatalities, though dust from certain agricultural commodities and many energy commodities are flammable and/or explosive.

Although responsible production is largely limited to supplier due diligence, companies rely on suppliers to produce the commodities they sell. All companies in the sector have access to a number of suppliers and are consequently not affected by production issues on the part of any one supplier.

Many companies have worked with suppliers to ensure they can document sustainable sourcing, fair wage and child labor requirements. Changing consumer patterns, government regulations or industry standards have an impact on the types of commodities these companies transport, and the timing of these changes has allowed companies to shift or modify resources to handle new products or documentation requirements. Certain sectors such as agricultural commodities will benefit from global demographic changes and income growth in developing countries.

Moody's related publications

Methodology

» General Principles for Assessing Environmental, Social and Governance Risks, 9 January 2019

Non-Credit Rating Assessment Framework

» Non-financial companies – Global: Framework to assess carbon transition risk for corporate sectors, 24 September 2019

» Non-financial companies: Corporate governance assessment for publicly traded non-financial companies, 25 July 2019

Sector In-Depths

» Corporate boards – North America: Gender diversity is correlated with higher ratings, but mandates pose short-term risk, 11 September 2019

» Cross-sector: Digital technologies can boost productivity and reshape labor markets, industries and credit, 25 July 2019

» Healthcare - US: Curbs on surprise medical bills would impact hospitals, staffing companies, 20 June 2019

» Cross-Sector - Global: Credit implications of cyber risk will hinge on business disruptions, reputational effects, 28 February 2019

» Cross-sector: Social issues can be material to private issuers' credit quality but are not typically the primary driver, 20 February 2019

» Cross-sector: Social issues have multiple impacts on government credit quality, 28 November 2018

» Mining- Mexico: Proposed social-driven changes to Mexican mining law would raise regulatory burden, 23 November 2018

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» Banks — Asia Pacific Demographic changes will bring new challenges and opportunities in next decade, 18 September 2018

» Cross-Sector- North America: For governments and corporates, marijuana brings possible gains and pressures, 8 May 2018

» Pharmaceuticals and Distributors — US Drug manufacturers and distributors face rising risks related to the US opioid crisis, 30 November 2017

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» ESG - California: Public safety power shutoffs highlight links between environmental and social risks, 28 October 2019

» Tobacco - US FDA plan to ban menthol cigarettes, restrict flavoured e-cigarette sales is credit negative, 21 November 2018

» Asset Management UK gender pay disclosures will drive better corporate governance for asset managers, a credit positive, 5 April 2018

ESG Focus

» ESG Focus October 2019: Moody's launches ESG assessment tools, 15 July 2019

» ESG Focus July 2019: Moody's develops ESG analytical tools, 15 July 2019

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