3.D Risk factors

Risk management

We are exposed to a variety of risks that can affect our business performance, reputation and licence to operate – financially, operationally and in terms of compliance. Creating shareholder value is the reward for taking and accepting risk. Effective management of risk is therefore critical to whether we can achieve our strategic objectives.

The risk landscape in 2018
The geopolitical context remained unsettled during 2018, with rising trade tensions creating increased market volatility. We have, however, generally experienced a favourable market and pricing environment. While there have been inflationary cost pressures affecting the industry, we have focused on delivering continued operational efficiencies through our mine-to-market productivity programme to defend our margins. Our solid cash flows, underpinned by strong prices and cash from divestments, have further strengthened our balance sheet and decreased our liquidity risk. We have also maintained a strong discipline around capital allocation: returning cash to shareholders and investing in high-quality long-term greenfield and brownfield projects.

In 2018, we continued to enhance our controls for managing operational risks. In particular, we are strengthening how we manage the risks of major hazards through a Group-wide improvement programme, and are applying more rigorous cyber-security controls to deal with the evolving and growing threat of cyber attacks and security exposures.

Our trading and sales and marketing teams have continued to develop a more sophisticated market interface with the ongoing expansion of our Commercial division in Singapore. We are building a robust governance, risk and controls framework to support the Commercial team and to manage the strategic, financial and operational risks to which they are exposed.

We also continue to focus on managing risks relating to our relationships with governments, communities and key customers and suppliers. Our partner-to-operate strategy supports the creation and maintenance of mutually beneficial partnerships with key stakeholders, particularly host governments.

Our managed and non-managed joint ventures, particularly operations in places with higher sovereign risk, continue to need close monitoring and active management. Our non-managed joint-venture portfolio is now better aligned with our strategic priorities and appetite for risk, after the sale of our interest in the Grasberg mine in Indonesia. And we are continuing to refine our portfolio for a future carbon-constrained world, with the sale of our Australian coal assets.

You can see changes to our risk profile during 2018 on the following pages. For more detail on movements and the monitoring of these exposures, see pages 34-51 (Business reviews), 76-141 (the Directors' report) and the Notes to the financial statements on page 150 of the Annual report 2018.

Emerging risks
In the near term, we expect to face continued macroeconomic and geopolitical uncertainty. The global economic cycle is expected to weaken due to monetary policy normalisation, the fading impacts of the US stimulus and weakening demand in China. We see the most significant short-term risks to be the impact on market sentiment of continuing global trade tensions, the potential for a sharp and prolonged downward correction in global equities, and a worse-than-expected slowdown in the Chinese economy.

We are also mindful of the ongoing rise of populism in many of the markets in which we operate. This is likely to lead to increasing resource nationalism and pressure from governments, communities and customers for a greater share of the wealth that our business creates. Related to this, we also see a tightening of scrutiny around foreign investments.

In the medium term, we see both threats and opportunities in technological disruption – from mining and processing automation to machine learning and artificial intelligence. We aim to use these technologies to improve productivity in increasingly sophisticated markets, while managing the social implications of automation in partnership with our host governments.

In the longer term, we predict increasing demand for sustainable working practices and a growing need to manage environmental and other risks to our licence to operate, such as land reform. Climate change represents perhaps the greatest long-term threat to our business, but also brings opportunities. We will need to show resilience to the risks it poses – physical, regulatory and market. A low-carbon economy may lead to structural shifts such as a step-change in recycling, but it will also fuel higher demand for commodities like copper and raw materials for batteries.

Already, societal expectations around water and closure management are changing. We have considerably enhanced our framework for managing water risk, developing a comprehensive Water Risk Profile, Group-wide water metric and

Group water target. We have also created a centrally coordinated closure strategy and a dedicated Closure team to provide strong lifecycle planning and to oversee our growing activities related to closing and repurposing our sites.

Principal risks and uncertainties exposure at a glance – 2018 trend

	External	Internal	Internal and external
Increasing risk or uncertainty	-Sovereign risk -China development pathway -Commodity prices		-Attracting and retaining talent
No change in risk or uncertainty	-Strategic partnership	-Execution of acquisitions and divestments -Capital project development -Health, safety, environment and communities	-Exploration and resources -Operational excellence -Regulation and regulatory intervention
Decreasing risk or uncertainty			-Liquidity

How we manage risk

Underpinned by our risk policy and standards, our approach to risk management and internal control is aimed at embedding risk awareness in all decision-making, and a commitment to managing risk proactively and effectively. This includes:

- Identifying and evaluating threats and opportunities early.
- Managing and preventing threats before they materialise, and responding effectively if they do.
- Actively pursuing opportunities to capture value within agreed risk tolerances.

We make accountability for risk management very clear in our business – this is a key performance area for line managers.

Our Risk team supports the understanding and management of risk at all levels of the business. They provide a framework for managing and reporting material risks, escalating key issues to the Executive Committee and ultimately to the board, if appropriate. They also support the Risk Management Committee.

Our process for identifying, evaluating and managing material business risks is designed to manage rather than eliminate threats – where appropriate, accepting a degree of risk to generate returns. Certain threats, such as natural disasters, cannot be managed using internal controls, and there is limited capacity in the international insurance markets to transfer such risks.

We have material investments in a number of jointly controlled entities. Where we do not have managerial control, we may be unable to ensure that management will comply with our policies and standards, but we use what influence we have.

Our risk management framework

The responsibility for identifying, evaluating and managing risks lies with all our employees and business leaders. They operate within the Group-wide framework to manage risks within approved limits.

The framework also defines the oversight responsibilities of the board and the Executive Committee. Both are supported by our Risk Management Committee and central support functions, such as Risk and Group Internal Audit, to enable the effective identification, evaluation and management of risk across our business.

Our framework lays out a three lines of defence approach to managing risks and controls:

First line: employees and business leaders own risks.

Second line: our central support functions and Risk Management Committee control our risk framework and internal control systems.

Third line: Group Internal Audit assures our internal control systems.

The key risk management responsibilities throughout the Group are outlined below.

Our risk management framework

Oversight	**Board**	-Determines the nature and extent of acceptable risk as we pursue our strategic objectives. -Confirms that management's risk limits reflect the level of risk the board is willing to accept to achieve our strategic objectives. -Oversees the risk management process.
	Board committees	-At least once a year, the Audit Committee monitors and reviews the maturity and effectiveness of our risk management and internal control systems. -The Audit and Sustainability Committees review regular reports from management on the strategies and controls applied to any material business risks identified within the Committees' scope.
Third line	**Group Internal Audit**	-Provides independent and objective assurance that our risk management and internal control systems are adequate and effective.
Second line	**Executive Committee**	-Sets our risk strategy and assesses the risks inherent in key investments and in strategic, business or annual plans.
	Risk Management Committee	-Oversees our risk management framework to help identify significant risks to Group-level objectives and to make sure we have effective risk management processes.
	Risk function	-Coordinates and supports Group-level risk management activity and reporting. -Embeds risk management into core business processes, such as planning and capital allocation. -Builds risk management capability and a risk-aware culture throughout the Group.
	Other central support functions and management committees	-Provide targeted expertise and support to risk, action and control owners. -Develop and maintain specific controls, including policies, standards and procedures, to support the effective management of material Group-level risk within the agreed limits. -Assure first line of defence compliance with controls.
First line	**Product groups and central functions, executive/audit forums**	-Monitor material risks and track activities to manage risk within their own business activities, escalating when appropriate. -Consider risk and uncertainty in strategic and business planning and capital allocation proposals.
	Product groups and business units	-Identify, assess and manage risks in operations, functions and projects.
	Risk Community of Practice	-Supports alignment, consistency and continuous improvement of risk management.

Table of Contents

Principal risks and uncertainties

The principal risks and uncertainties outlined in this section reflect the inherent risks that could materially affect Rio Tinto or its ability to meet its strategic objectives, either directly or by triggering a succession of events that in aggregate become material to the Group.

Rio Tinto’s business units and functions assess the potential economic and non-economic consequences of their respective risks using the framework defined by the Group’s Risk standard. Once identified, each principal risk or uncertainty is reviewed and monitored by the relevant internal experts and by the Risk Management Committee and, as appropriate, by the relevant board committees and the board.

There may be additional risks unknown to Rio Tinto and other risks currently not believed to be material which could turn out to be material. A number of them, particularly those with longer-term potential impacts, are referred to in the sustainable development section on pages 52 to 63 of the Annual report 2018.

The principal risks and uncertainties should be considered in connection with any forward-looking statements in the Annual report 2018 and the cautionary statement on page 300 of the Annual report 2018.

Market risks

Rio Tinto operates in global markets and accepts the impact of exchange rate movements and market-driven prices for our commodities, seeking premiums where possible.

Commodity prices: inherent risk and uncertainty Commodity prices, driven by demand and supply for the Group’s products, vary outside of expectations over time. Exchange rate variations and geopolitical issues may offset or exacerbate this risk. Anticipating and responding to market movements is inherently uncertain and outcomes may vary.	**Threats** Falling commodity prices, or adverse exchange rate movements, reduce cash flow, limiting profitability and shareholder returns. These may trigger impairments and/or impact rating agency metrics. Extended subdued prices may reflect a longer-term fall in demand for the Group’s products, and the reduced earnings and cash flow streams resulting from this may limit investment and/or growth opportunities. Failure to deliver planned returns from commercial insights would negatively impact cash flows for the Group.
China development pathway: inherent risk and uncertainty China’s growth pathway could impact demand for the Group’s products outside of expectations.	**Threats** China is the largest market for our products, and Chinese demand is a strong driver, at times the dominant one, of the market price of the commodities we produce. An economic slowdown in China, and/or a material change in policy, could result in a slowdown in demand for our products and reduced earnings and cash flow for the Group.

Table of Contents

Strategic risks

Rio Tinto enforces disciplined capital allocation to the best returning opportunities (organic and inorganic growth projects) or returns to shareholders.

Execution of acquisitions and divestments: inherent risk and uncertainty Rio Tinto’s ability to secure planned value by successfully executing divestments and acquisitions may vary.	**Threats** Divestment and acquisition activity incurs transaction costs that cannot be recouped, or may result in value destruction by realising less than fair value for divestments or paying more than fair value for acquisitions. This could result in unforeseen pressure on the Group’s cash position or reduce the Group’s ability to expand operations. The Group may also be liable for the past acts or omissions of assets it has acquired that were unforeseen or greater than anticipated at the time of acquisition. The Group may also face liabilities for divested entities if the buyer fails to honour commitments or the Group agrees to retain certain liabilities.
Capital project development: inherent risk and uncertainty The Group’s ability to deliver projects successfully may vary.	**Threats** A delay or overrun in a project schedule could negatively impact the Group’s profitability, cash flows, ability to repay project-specific indebtedness, asset carrying values, growth aspirations and relationships with key stakeholders.
Strategic partnerships: inherent risk and uncertainty Strategic partnerships play a material role in delivering the Group’s production, cash and market positioning, and these may not always develop as planned.	**Threats** Joint-venture partners may hinder growth by not agreeing to support investment decisions. For non-managed operations, the decisions of the controlling partners may cause adverse impacts to the value of the Group’s interest in the operation or to its reputation and may expose it to unexpected financial liability.

Financial risk

Rio Tinto maintains a strong balance sheet and liquidity position to preserve financial flexibility through the cycle.

Liquidity: inherent risk and uncertainty External events and internal capital discipline may impact Group liquidity.	**Threats** The Group’s ability to raise sufficient funds for planned expenditure, such as capital growth and/or mergers and acquisitions, as well as the ability to weather a major economic downturn, could be compromised by a weak balance sheet and/or inadequate access to liquidity.

Resources risks

Rio Tinto invests materially to accurately identify new deposits and develop orebody knowledge, underpinning our operations and projects.

Exploration and resources: inherent risk and uncertainty	Threats
The success of the Group’s exploration activity may vary. In addition, estimates of ore reserves are based on uncertain assumptions that, if changed, could result in the need to restate ore reserves and mine plans.	A failure to discover new viable orebodies could undermine future growth prospects. The risk that new information comes to light or that operating conditions change means that the economic viability of some ore reserves and mine plans can be restated downwards. As a result, projects may be less successful and of shorter duration than initially anticipated, and/or the asset value may be impaired.

Health, safety, environment and community (HSE&C) risks

Rio Tinto’s operations are inherently hazardous. We manage responsibly to preserve our licence to operate and ensure our employees and contractors go home safe and healthy.

HSE&C: inherent risk and uncertainty	Threats
Our operations and projects are inherently hazardous with the potential to cause illness or injury, damage to the environment, disruption to a community or a threat to personal security.	Failure to manage our health, safety, environment or community risks could result in a catastrophic event or other long-term damage which could in turn harm the Group’s financial performance and licence to operate. Recognised hazards and threats include, among others, underground operations, pit slope instability, tailings facilities, process safety, infrastructure, vector-borne and pandemic disease, chemicals, gases, vehicles and machinery, aviation, extreme natural environments, endangered flora or fauna, areas of cultural heritage significance, water supply stress and climate change.

Stakeholder risks

Rio Tinto recognises the value of positive engagement with a range of stakeholders, and seeks to develop collaborative and mutually beneficial partnerships though our partner-to-operate strategy.

Sovereign risk: inherent risk and uncertainty	Threats
The Group’s operations are located across a number of jurisdictions, which exposes the Group to a wide range of economic, political, societal and regulatory environments.	Adverse actions by governments and others can result in operational/project delays or loss of licence to operate. Other potential actions can include expropriation, changes in taxation, and export or foreign investment restrictions, which may threaten the investment proposition, title, or carrying value of assets. Legal frameworks with respect to policies such as energy, climate change and mineral law may also change in a way that increases costs.

Governance risks

Rio Tinto employees operate in compliance with *The way we work* – our global code of business conduct, the Group delegation of authorities and all Group policies, standards and procedures.

Regulation and regulatory intervention: inherent risk and uncertainty The Group's reputation and regulatory licences are dependent upon appropriate business conduct and are threatened by actual or perceived breaches of law, reputation or our code of conduct.	**Threats** Fines may be imposed against Group companies for breaching anti-trust rules, anti-corruption legislation, sanctions or human rights violations or for other inappropriate business conduct. A serious allegation or formal investigation by increasingly connected regulatory authorities (regardless of ultimate finding) could result in a loss in share price value and/or assets or loss of business. Other consequences could include the criminal prosecution of individuals and/or Group companies, imprisonment, fines, legal liabilities and reputational damage to the Group. There may also be considerable cost and disruption in responding to allegations or investigations and related litigation, and in taking remedial action.

Operations, projects and people risks

Rio Tinto seeks to achieve operational and commercial excellence, and to attract and retain the best people in the industry.

Operational excellence: inherent risk and uncertainty Excellence at our operations and projects is derived from high operational and human productivity and innovation, which requires quality people, processes and systems.	**Threats** Business interruption may arise from a number of circumstances, including: -Operational difficulties throughout the value chain, such as extended industrial dispute, delayed development, bottlenecks or interruptions to infrastructure for power, water and transportation. -Operational failure such as a process safety incident, major pit slope, dump or tailings/water impoundment failure or underground incident. -Cyber breach/incident affecting commercial and operational systems. -Natural disasters such as earthquakes, subsidence, drought, flood, fire and storm can impact mines, smelters, refineries and infrastructure installations. Some of these risks are likely to increase through the impact of climate change. Any of these events could result in a significant HSE&C incident, an interruption to operations, the inability to deliver products or a commercial loss.
Attracting and retaining talent: inherent risk and uncertainty Attracting and retaining talent as the company and industry evolves presents a constant challenge.	**Threats** The inability to attract or retain key talent will constrain the Group's ability to reach its goals within planned timeframes.