Risk management

The risk management environment

2017 was a year where external uncertainty continued and internal risks required constant vigilance.

The geopolitical context for global trade remained unsettled. However, markets in general continued to grow. This combination drove a focus on external factors and the continuation of productivity initiatives in the Group to deliver our value-over-volume strategy. Enhancements to controls for managing operational risks (particularly cyber security and major hazards) sought to maintain and build resilience.

As stronger prices flowed through and supply was delivered in line with expectations, Rio Tinto retained its strong capital allocation discipline, returning cash to shareholders, further strengthening the balance sheet and investing in high quality long term green and brownfield projects.

Principal joint operations, managed and non-managed, and particularly those in jurisdictions with higher sovereign risk, continue to require close monitoring and active management.

Changes to the risk profile of the Group during 2017 are illustrated in the summary table below. Further detail on movements and monitoring of these exposures is provided in the relevant section of the Strategic report, including Market environment, Group strategy, product group overviews, the Directors' report and the Notes to financial statements of the Annual Report 2017.

Emerging risks

Looking ahead, the external risk landscape continues to evolve. In the relatively near term, increased protectionism and geopolitical uncertainty present risk and uncertainty to the operating environment. In the medium term, technological disruption – from increased automation in mining and processing to greater use of cognitive learning and artificial intelligence – provides both threats and opportunities as companies seek to secure competitive advantage. In the longer term, the societal imperative to manage areas of environmental risk is expected to increase at the macro level, as concern about the ineffective management of "global commons" – the oceans, atmosphere and climate system – drives a search for sustainable solutions.

Internally, the strengthening of the commercial capability of the Group, through the appointment of a chief commercial officer and the development of a strong governance and risk framework to support co-located commercial operations in Singapore, will ensure appropriately rigorous management of this increasingly important part of the business. In addition, the establishment of a dedicated closure team will provide stronger planning and oversight of the growing activities associated with responsible future mine closure.

Looking forward, managed and non-managed joint ventures as well as partnerships are likely to play a still larger role in the Group's portfolio. These mechanisms provide growth opportunities for the Group but will also require the further development of the Group's capability and capacity to manage and participate in these arrangements effectively.

Principal risks and uncertainties exposure at a glance – 2017 trend

		External	Internal	Internal and external
Increasing risk or uncertainty	▲	– Sovereign risk(a)		– Attracting and retaining talent
No change in risk or uncertainty	▬	– Strategic partnerships – Commodity prices – China growth pathway	– Execution of acquisitions and divestments – Capital project development – HSEC	– Exploration and resources – Operational excellence – Regulation and regulatory intervention
Decreasing risk or uncertainty	▼			– Liquidity

(a) Sovereign risk includes both direct risk from nation states and geopolitical uncertainty more broadly, and presents across all jurisdictions to which the Group has exposure.

Risk management framework

Rio Tinto is exposed to a variety of risks (both threats and opportunities) that can have financial, operational and compliance impacts on our business performance, reputation and licence to operate. The board recognises that creating shareholder value is the reward for taking and accepting risk. The effective management of risk is therefore critical to supporting the delivery of the Group's strategic objectives.

Rio Tinto's risk management framework reflects this. The responsibility for identifying and managing risks lies with all of Rio Tinto's employees and business leaders. They operate within the Group-wide framework to manage risks within approved limits.

The framework includes clearly defined oversight responsibilities for the board and the Executive Committee, who are supported by the Risk Management Committee and central support functions including Group Risk and Group Internal Audit, to enable effective risk identification, evaluation and management across Rio Tinto.

This approach reflects a "three lines of defence" model for the management of risks and controls:

- First line of defence: ownership of risk by employees and business leaders.
- Second line of defence: control of risk framework and systems of internal control by central support functions and the Risk Management Committee.
- Third line of defence: assurance of systems of internal control by Group Internal Audit.

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

Approach

The Group's approach to risk management and internal control, underpinned by the Risk policy and standards, is aimed at embedding a risk-aware culture in all decision-making, and a commitment to managing risk in a proactive and effective manner. This includes the:

- early identification and evaluation of threats and opportunities;
- management and mitigation of threats before they materialise and effective response if they do materialise; and
- active pursuit of opportunities to capture value, within agreed risk tolerances.

Accountability for risk management is clear throughout the Group and is a key performance area for line managers.

To support risk understanding and management at all levels, the Group Risk function provides the necessary infrastructure to support the management and reporting of material risks within the Group, and escalates key issues through the Executive Committee and ultimately to the board, where appropriate.

Group Risk also supports the Risk Management Committee in its review of risk.

The process for identifying, evaluating and managing material business risks is designed to manage, rather than eliminate, threats and where appropriate accept risk to generate returns. Certain threats, for example natural disasters, cannot be managed using internal controls. Such major threats are transferred to third parties in the international insurance markets, to the extent considered appropriate or possible.

The Group has material investments in a number of jointly controlled entities. Where Rio Tinto does not have managerial control, it is usually unable to ensure that management will comply with all Rio Tinto policies and standards.

Oversight	**Board**	– Determine the nature and extent of risk that is acceptable in pursuit of strategic objectives – Confirm that management's risk limits reflect the level of risk the board is willing to accept in pursuit of strategic objectives – Provide oversight across the risk management process
	Board committees	– The Audit Committee monitors and reviews at least annually the maturity and effectiveness of management processes and controls designed to identify, assess, monitor and manage risk – The Audit and Sustainability Committees review periodic reports from management: identifying the Group's material business risks within the committees' scope; and the risk management strategies and controls applied
Third line	**Group Internal Audit**	– Provide independent and objective assurance that the systems of internal controls are adequate and effective
Second line	**Executive Committee**	– Set risk strategy and assess risks inherent in key investments and in strategic, business or annual plans
	Risk Management Committee	– Oversee the risk management framework to facilitate the identification of significant risks to Group-level objectives and ensure effective risk management processes are in place
	Group Risk	– Provide co-ordination and support of Group-level risk management activity and reporting – Embed risk management into core business processes, such as planning and capital allocation – Build risk management capability and a risk culture throughout the Group
	Other central support functions and management committees	– Provide targeted expertise and support to risk 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 business activities, and escalate where 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, utilising risk registers and our Group-wide risk data system (Archer)
	Risk managers and Risk Forum	– The Risk Forum (risk managers across the Group) supports alignment, consistency and continuous improvement of risk management

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 of the Annual Report 2017 on pages 28 to 37.

The principal risks and uncertainties should be considered in connection with any forward-looking statements in the Annual Report 2017 and the cautionary statement on the inside front cover.

Inherent risk and Uncertainty	**Potential downside impact (threats)**
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, 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.	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 consequent reduced revenue streams may limit investment and/or growth opportunities. Failure to deliver planned returns from commercial insights would negatively impact cash flows for the Group.
China's growth pathway could impact demand for the Group's products outside of expectations.	China is the largest market for our products by a long way, 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 revenues for the Group.
Financial risks	
Rio Tinto maintains a strong balance sheet and liquidity position to preserve financial flexibility through the cycle.	
External events and internal discipline may impact Group liquidity.	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.

Inherent risk and uncertainty	Potential downside impact (threats)
Strategic risks	
Rio Tinto enforces disciplined capital allocation to the best returning opportunities (organic and inorganic growth projects or returns to shareholders).	
Rio Tinto’s ability to secure planned value by successfully executing divestments and acquisitions may vary.	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.
The Group’s ability to deliver projects successfully may vary.	A delay or overrun in the 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 play a material role in delivering the Group’s production, cash and market positioning, and these may not always develop as planned.	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.
Health, Safety, Environment and Community (HSEC) risks	
Rio Tinto’s operations are inherently hazardous. We lead responsibly to preserve our licence to operate and ensure our employees and contractors go home safe and healthy.	
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, aviation, pit slope instability, tailings facilities, process safety, infrastructure, vector-borne and pandemic disease, chemicals, gases, vehicles and machinery, extreme natural environments, endangered flora or fauna, areas of cultural heritage significance, water supply stress and climate change.
Resources risks	
Rio Tinto invests materially to accurately identify new deposits and develop orebody knowledge, underpinning our operations and projects.	
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 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.

Inherent risk and uncertainty	Potential downside impact (threats)
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 is derived from high operational and human productivity, which requires quality people, processes and systems.	Business interruption may arise from a number of circumstances, including: – Operational difficulties such as extended industrial dispute, delayed development, bottlenecks or interruptions to infrastructure for power, water and transportation, throughout the value chain. – Operational failure such as a process safety incident, major pit slope, dump or tailings/water impoundment failure, underground incident. – Cyber breach/incident of 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 HSEC incident, an interruption to operations, or the inability to deliver products and a commercial loss.
Attracting and retaining talent as the company and industry evolves presents a constant challenge.	The inability to attract or retain key talent will constrain the Group's ability to reach its goals within planned timeframes.
Stakeholder risks Rio Tinto recognises positive engagement with a range of stakeholders, and seeks to develop collaborative and mutually beneficial partnerships though our "partner to operate" strategy.	
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.	
The Group's reputation and regulatory licences are dependent upon appropriate business conduct and are threatened by a public allegation of potential misbehaviour or by regulatory investigation.	Fines may be imposed against Group companies for breaching antitrust 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 loss of business. Other consequences could include the criminal prosecution of individuals, imprisonment and/or personal fines, and 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.