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Megamin Mining SWOT Analysis

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IB BUSINESS MANAGEMENT – PRE-RELEASED CASE STUDY NOVEMBER 2021: SWOT ANALYSIS

The internal strengths and weaknesses, and the external opportunities and threats are analysed and used to evaluate Megamin Mining's business model. A summary SWOT is provided in Table 1 below, and each point should then be comprehensively explained by the student.

Figure 1: Megamin Mining summary SWOT analysis

Strengths (internal)

- Family of founder are actively involved
- Established business
- Experience and established procedures for managing global operations
- Profitable
- Strong recent appreciation of hotel and property assets
- Diversified across different industries
- Diversified mining portfolio across commodity type and countries of operation
- Historically high commodity prices

Weaknesses (internal)

- Costs increasing
- Low occupancy rates of hotels
- Culture clash between management and stakeholder groups (e.g., environmental pressure groups)
- HRM issues around wage rates in different locations
- Low productivity at African operations
- Demand for palladium is decreasing
- Trouble complying with environmental regulations (e.g., CO_2 emissions monitoring)
- Decline in value of oil revenues and assets

Opportunities (external)

- Adopt new mining 4.0 technologies
- Diversification strategies: new products, new markets and/or vertical integration
- Acquire other mining companies
- Invest in new Australian lithium mine
- Increasing demand for commodities as business environment improves
- Leverage investment from increased value of property and hotel portfolio
- Government support (e.g., subsidies)
- Adopt remote-working technologies

Threats (external)

- Current and future competitors in the market
- Environmental, safety and labour regulations
- Environmental and safety disasters
- Trade barriers linked to carbon adjustments
- Pandemic recession in key markets
- Exchange rate volatility
- Recruiting talented staff
- Governments demanding higher royalties or nationalising mining assets

Megamin Mining SWOT Analysis

STRENGTHS (INTERNAL):

- **Family of founder are actively involved**: There are at least two family members of the founders actively involved in the company in very senior management positions – CEO and Finance Director. As such they are all actively involved in all aspects of the business (finance, operations, strategic planning, marketing, etc.). It is likely that Isla and Ethan have grown up in an environment where they were surrounded by all things mining, hotels and property. They are industry insiders and are well positioned to provide leadership and guidance to the board of directors in planning MM's strategic direction. ★★★
- **Established business**: Megamin Mining has been operating successfully for over 130 years now and has established itself to be a major mining company. The company knows how to execute their mining operations with a high degree of professionalism, distribute and sell their mining products profitably, manage customer relationships, navigate environmental regulations and the labour laws of the different countries they operate in employment laws – all successfully – stands the company in good stead for the future. There are issues in the hotel division that need to be overcome – the company's marketing mix needs to become better integrated to attract and retain customers to grow revenues and profitability. Barriers to entry into the mining and hotel industry appear to be increasing as size confers economies of scale and new technologies (AI, big data and machine learning require large investments and talented employees), limiting the potential number of smaller competitors in the mining and hotel industries. ★★★★
- **Experience and established procedures for managing global operations**: The company has been extracting resources from the earth for over 130 years and doing so in multiple countries. As such MM is experienced in dealing with different governments, cultures, labour and environmental laws. The challenges faced in supply chains will vary from country to country and MM will be in a position to generalise from other operations to solve problems in a specific country. There would only be a handful of global mining firms that would have the wherewithal to successfully mine in many developing countries, meaning that there are high barriers to entry in the mining industry keeping competition low and margins relatively high. ★★★★★
- **Profitable**: Oil and gas, palladium, copper and gold prices are comparatively high across the commodity cycle, thus, the mining and oil production divisions would likely be generating good profits for the company (although costs are increasing in oil extraction). "Office rental incomes are high and property prices are increasing in European cities. Hotel property prices are also increasing." Megamin Mining can then use retained profits as a source of finance for new investment projects such as diversifying into lithium mining. If creating shareholder value is one of the company's aims, then profits could be distributed as a higher dividend to shareholders and/or share buyback schemes used to boost the value of MM's shares. The only drag on MM's profitability is their hotel division, where profitability is falling on the back of lower sales revenues. ★★★★
- **Strong recent appreciation of hotel and property assets**: MM not only has hotel assets it also owns commercial property such buildings in central business districts which it would rent out to companies. Taken together, MM's hotel and commercial property would be very valuable assets considering the length of time the company has been accumulating property and the inexorable increase in prices over time. Rental income and property values are highly correlated; as property prices increase, MM would increase rents when current leases expired, driving long term increases in profits. The ever increasing equity that rising property values generate means that MM's property assets can be used to leverage other investments the company may be considering. ★★★★
- **Diversified across different industries**: A diversification strategy is a practice where a firm enters an industry or market that is different from its core business. Reasons for diversification include (1)

reducing risk of relying on only one or few income sources, (2) avoiding cyclical or seasonal fluctuations by producing goods or services with different demand cycles, (3) achieving a higher growth rate, and (4) countering a competitor by invading the competitor's core industry or market. MM has a good degree of diversification, and this will go a long way to protect profitability if the company decides it needs to divest itself of its polluting oil division assets. ★★★★

- **Diversified mining portfolio across commodity type and countries of operation**: A diversification strategy is a practice where a firm enters an industry or market that is different from its core business. Reasons for diversification include (1) reducing risk of relying on only one or few income sources, (2) avoiding cyclical or seasonal fluctuations by producing goods or services with different demand cycles, (3) achieving a higher growth rate, and (4) countering a competitor by invading the competitor's core industry or market. On each of the four above points, diversifying into lithium mining ticks all the right boxes. Firstly, lithium mining will bring in another revenue stream for MM, adding to its palladium, copper, gold and oil revenues within its mining division. When this is considered in the context of a multinational conglomerate, which is in its nature diversified across products and geographical location. Secondly, if the price of say copper falls, then stable or increasing lithium prices would support MM's cashflows. Having diversified mining operations allows MM to smooth its cashflows over volatile commodity cycles. For example, some years copper will be high and lithium low, and in other years lithium prices will be high and copper prices low. It is less likely that both copper and lithium prices will be low simultaneously. Thirdly, the forecast growth rate for lithium demand looks lucrative as the world transitions to a green economy and the lithium batteries much of this depends on (e.g., electric car batteries and wind and solar electricity storage). Finally, the acquisition of Chilean mining operations is by definition taking market share away from competitors, as the lithium revenues lost by one of MM's competitors is added to MM's revenues. ★★★
- **Historically high commodity prices**: The world may be entering a new commodity super-cycle driven by a post-pandemic increase in demand and the transition to green technologies such as electric vehicles. Commodity prices go through extended periods during which they are well above or well below their long-term trends. The upswing phase in commodity super-cycles occurs when unexpected, persistent, and positive demand trends contrast with typically slow-moving supply. Eventually, as more supply becomes available and demand growth slows, the cycle enters a downswing phase. Individual commodity groups have their own price patterns. But when charted together they display extended periods of price trends known as 'commodity super-cycles'. Commodity super-cycles are different from occasional supply disruptions, because high or low prices persist over time. There is every chance that the commodities MM mines and sells will see increasing prices well into the future before long-term new mining projects around the world begin to significantly increase supply in the long term, when prices may decrease again. Mining profits should see sustainable growth and increased net cashflows factor favourably into any investment appraisal of a new mining asset/project being considered; i.e., high commodity prices would allow MM to grow and expand. ★★★

WEAKNESSES (INTERNAL):

- **Costs increasing**: The oil production division is facing increasing costs as oil becomes more expensive to extract from existing oil assets as M has to drill deeper and more often to tap shrinking reserves. The adoption of new technologies could limit such increases; technologies such as directional drilling (the practice of accessing an underground oil or gas reserve by drilling in a non-vertical direction) increases the efficiency of oil and gas extraction and can also lessen the environmental impact of drilling. However, while costs may be increasing, higher oil prices may somewhat compensate for this. The demand for oil is falling, but supply is also decreasing with less oil being produced as companies exit the industry and finding new sources becomes more and more difficult – high oil prices may be with us for some time. Other costs that MM would likely find to be increasing include:
    - Transport and shipping costs have skyrocketed in recent times.
    - Labour costs are increasing in Europe and the US as labour shortages continue to bite, especially in hospitality industries.
    - The price of carbon credits is continuing to march upwards.
    - Tighter environmental regulations increase compliance costs. ★★★
- **Culture clash between management and stakeholder groups (e.g., environmental pressure groups)**: The demand for transparency on sustainable and socially responsible practices is on the rise. Companies are accountable to their various stakeholders like investors, customers, employees, and nongovernmental organisations (NGOs) that want to evaluate a company's impact on the world. Environmental, Social and Governance (ESG) analysis and reporting can provide valuable insights and help create long-term value for stakeholders. It can significantly impact the financial metrics of a company and better inform investment decisions. MM operates in some particularly polluting industries in locations where labour protection and environmental regulation enforcement is lax. ESG reporting is still voluntary in many countries but mandatory for large companies in the EU and the US. It's likely that MM's labour relations and environmental impact would be poorly performing in its ESG report, setting up a culture clash between the company and labour unions and environmental groups. This clash would be a driving force for change in renumeration and working conditions in the company's mines, as well as divesting its polluting oil assets and establishing significant carbon offset programmes. ★★★
- **HRM issues around wage rates in different locations**: It is likely that the comparatively low wage rates at MM's Berlin, Rome and Geneva hotels will need to rise to remove a source of dissatisfaction amongst these workers. Costs will increase. However, it is possible that productivity may also increase as higher wages attract more skilled and experienced staff. It is possible that wage increases could be limited in the company's Chilean and South African operations. There is no difficulty in recruiting labour at current wage rates in Chile, and motivation is unaffected by renumeration (cf. Herzberg). Herzberg did not claim that pay did not matter, but that it moves people to do a job and does not motivate them to do it well. ★★
- **Low productivity at African operations**: Low productivity increase per unit costs (e.g., the cost to mine and refine a tonne of palladium) and lowers profitability. MM will need a strategy to increase productivity in its South African palladium mine. Higher productivity may be achieved by increasing automation in its mining operations to become more capital intensive and less labour intensive. It could also be achieved by HRM strategies such as teamworking. The motivators need to be in place for workers to be prepared to work willingly and to always give of their best. Herzberg suggested that motivators could be provided by adopting the principles of job enrichment - which aims to use the full capabilities of workers by giving them the opportunity to do more challenging and fulfilling

work. There are three main features of job enrichment: assign workers complete units of work, provide feedback on performance, and give workers a range of tasks. ★★

- **Demand for palladium is decreasing:** Palladium prices are surging and MM's palladium mine is "highly profitable". A commodity price rise when demand is falling means that the global supply of palladium is decreasing. It is unlikely that MM will invest in new palladium assets and will "milk" this "cash cow" (BCG matrix) for as long as it is profitable to do so. ★
- **Trouble complying with environmental regulations (e.g., CO2 emissions monitoring)**: MM is a diversified conglomerate with activities across different industries and countries, as such it is going to be very difficult to monitor, collate and report on its emissions. An integrated IT network (line 139) may be a solution to that goes some way to rectifying this problem. However, a general rule of thumb for developing and implementing a new IT system is that it takes much longer, costs much more, and has less functionality than anticipated. MM will need to choose their supplier very carefully and place a senior and experienced manager to oversee the project. ★★
- **Decline in value of oil revenues and assets**: This would be anticipated as oil is becoming more costly and difficult to extract while demand for oil is peaking as the world transitions to a green economy. MM will have a contingency plan for this. They can continue extraction for as long as it remains profitable to do so, which is a strategy that does not align with its plan to stop polluting activities and set strict climate change targets. Or MM can divest itself of its oil assets now, when the price of such assets though declining are likely to be as high as they will ever be again. Divesting would be aligned to the company's pollution and climate change objectives.

OPPORTUNITIES (EXTERNAL):

- **Adopt new mining 4.0 technologies**: Mining is going through a process of technological change. MM's current operations may require significant investment in automation technologies to increase productivity. New mines will be more costly to develop as expensive new technology is integrated into operations but less costly to operate, and the cost per unit of output will decrease (e.g., the cost to mine and refine a tonne of lithium). Most of these technologies also have application beyond mining and can support linkage development to other sectors of the economy. Such 4.0 technologies include automation, remote control, electrification, renewable energy, digitalisation, and remote sensing, with specific attention being paid to both environmental and economic benefits. Thus, an innovative and large-scale Australian lithium mine would be highly efficient and productive, while aligning with MM's objective of strengthening ethical values throughout the company. Taken together, with new technologies incorporated into operations, the Australian option would be highly productive and achieve economies of scale, boosting profitability over a much longer period, while simultaneously shifting the company towards a more sustainable and ethical future★★★★
- **Diversification strategies: new products, new markets and/or vertical integration**: A diversification strategy is a practice where a firm enters an industry or market that is different from its core business. Reasons for diversification include (1) reducing risk of relying on only one or few income sources, (2) avoiding cyclical or seasonal fluctuations by producing goods or services with different demand cycles, (3) achieving a higher growth rate, and (4) countering a competitor by invading the competitor's core industry or market. On each of the four above points, diversifying into lithium mining ticks all the right boxes. Firstly, lithium mining will bring in another revenue stream for MM, adding to its palladium, copper, gold and oil revenues within its mining division. When this is considered in the context of a multinational conglomerate, which is in its nature diversified across

products and geographical location. Secondly, if the price of say copper falls, then stable or increasing lithium prices would support MM's cashflows. Having diversified mining operations allows MM to smooth its cashflows over volatile commodity cycles. For example, some years copper will be high and lithium low, and in other years lithium prices will be high and copper prices low. It is less likely that both copper and lithium prices will be low simultaneously. Thirdly, the forecast growth rate for lithium demand looks lucrative as the world transitions to a green economy and the lithium batteries much of this depends on (e.g., electric car batteries and wind and solar electricity storage). MM could also consider diversification via a strategy of vertical integration. For example, the company could acquire a copper smelting firm to add value to the copper ore it already produces. ★★★★

- **Acquire other mining companies**: Finally, the acquisition of Chilean mining operations is by definition taking market share away from competitors, as the lithium revenues lost by one of MM's competitors is added to MM's revenues. An acquisition is when a company buys over 50% of the shares of another company and becomes the controlling owner. This increased market share is gained relatively quickly as mining operations are already established. Whereas the joint venture and 'go it alone' options will grow market share much more slowly as any new mining operation will take a much longer time to develop net positive cashflow and achieve profitability. This would allow MM to:
    - Obtaining quality staff or additional skills, knowledge of the industry or sector and other business intelligence. For instance, a business with good management and process systems will be useful to a buyer who wants to improve their own. Ideally, the business chosen should have systems that complement MM's own and that will adapt to running a larger business.
    - Accessing funds or valuable assets for new development. Better production facilities are often less expensive to buy than to build. MM should look for target businesses that are only marginally profitable and have large unused capacity.
    - Accessing a wider customer base and increasing market share. MM's target business may have specialist skills and systems it can use for their own offerings.
    - Diversification of the products, services and long-term prospects of MM's business. A target business may be able to offer products or services which MM has not developed.
    - Reducing costs and overheads through shared sales budgets, increased purchasing power and lower costs.
    - Reducing competition. Buying up new intellectual property, products or services may be cheaper than developing these inhouse.
    - Organic growth, i.e., the existing business plan for growth, needs to be accelerated. Businesses in the same sector or location can combine resources to reduce costs, remove duplicated facilities or departments and increase revenue. ★★★★
- **Invest in new Australian lithium mine**: In line with the advantages of diversification examined above, lithium is marketed to other businesses (business-to-business) such as car companies that require the raw material to manufacture their lithium-ion batteries. The fact that demand for lithium is anticipated to grow means that MM will be able to sell their new product into new markets (e.g., Japan, Korea and Germany) and to other market segments such as power generation companies looking to store the renewable energy they produce – keeping the lights on at night and when the wind does not blow. The Australian lithium option is the most likely to achieve large scale. Economies of scale are crucial in the mining industry, with little to no control over the price of such commodities, profits are made by driving down unit costs (e.g., cost to produce a tonne of lithium) and expanding output – a high volume, low value approach. Further, entering the market for lithium burnishes the company's green credentials, especially if the mining of lithium can be achieved in an environmentally sustainable way. This would be considered another driving force for the Australian

lithium investment. Australia is an enormous, dry and sparsely populated country. Thus, lithium mining is much less likely to negatively impact local communities and local water sources. Investment is the latest 4.0 mining technologies would further reduce the new mine's environmental impact. ★★★★★

- **Increasing demand for commodities as business environment improves**: In general, 2020 – the year of the pandemic – was a difficult year to operate a business. However, we know that MM had a remarkably successful year all things considered; e.g.: the South African palladium mine is "highly profitable"). Global economic activity slumped in 2020, being down almost ten percent, year-on-year as the world was slammed by covid-19 and the uncertainties surrounding the Brexit process. As domestic and international economic activity begins to recover, MM is in a great position to capitalise on this, having a strong balance sheet and growing income to finance investments in new projects and expand production at existing mines. ★★★
- **Leverage investment from increased value of property and hotel portfolio**: Commercial property prices have been booming in recent years. MM has significant commercial properties and hotels, the value of which has steadily increased. The ever-increasing equity that rising property values generate means that MM's property assets can be used to leverage other investments the company may be considering driving growth. ★★★
- **Government support (e.g., subsidies)**: There is government support for the mining industry. Countries around the world spend billions and billions of dollars on the mining industry. The Australian government may offer financial incentives such as preferential tax rates and tax holidays for companies establishing new mining operations in Australia. ★
- **Adopt new remote working technologies**: 2020 was a year of rapid adoption of new remote working technologies such as Zoom and Teams, as well as productivity tracking software. MM may be able to shift operations to centralise the management of global mining operations and allow its staff work for the company from any location. These new technologies will help with customer relationship management in geographically diverse locations, but it may be more difficult for MM to pitch for new supply contracts without face-to-face interactions. ★★

THREATS (EXTERNAL):

- **Current and future competitors in the market**: MM operates in a competitive environment. A relatively small number of global mining companies have come to dominate their industry after decades of acquiring smaller companies across a range of different commodities: copper, lithium, iron, etc. The large mining companies have:
  - Vast experience developing new mines and producing ores around the globe.
  - The advantage of attracting and retaining the best talent.
  - Scale and scope to have efficient, established and reliable supply chains.
  - Unrivalled financial resources.
  - Refined business models capable of adapting to new segments and different niches.

  Size confers economies of scale and new technologies (AI, big data and machine learning require large investments and talented employees), limiting the potential number of smaller competitors in the global mining industry. The big mining companies also compete to secure the best mineral and metal ore deposits, often bidding against each other to secure the rights to the best deposits from foreign governments. ★★★

- **Environmental, safety and labour regulations**: Mining is both dangerous and dirty. High-to-middles income countries have introduced environmental and worker safety legislation. Complying with such regulations increases the costs of doing business in the mining industry. Developing countries have enacted more such regulations but monitoring and enforcement is often lax as these countries do not have the resources to supervise mining operations effectively. As more such legislation is introduced, costs will rise and new mines will become increasingly difficult to establish. New climate legislation would be expected to impact the extractive industries heavily. ★★
- **Environmental and safety disasters**: MM is strengthening ethical values throughout the business. Mining activities that are found to be contaminating waterways or causing harm to workers do not align with the company's values. Such disasters would reflect badly on the company and fines and compensation can be expected where negligence can be established. However, such disasters would be unlikely to effect sales to any meaningful extent – a commodity is a commodity and there is little to differentiate MM's mined ores from that of the competition. ★★
- **Trade barriers linked to carbon adjustments**: MM mines its minerals, ores and hydrocarbons across the world and then exports them to major markets such as China, the EU and the US. A carbon border adjustment is a fee on imports based on the carbon emissions incurred in the production of those goods. In effect, it is a carbon tax on foreign products entering US or EU markets (with other markets following later). It has the same effect as a tariff, raising the price of the product in the market and reducing the quantity that will be sold. Mining companies, which are particularly bad CO_2 producers operating outside of the US and EU would be hit hard – revenues and profits would decrease. ★★★
- **Pandemic recession in key markets**: The coronavirus pandemic and related macroeconomic shock will likely result in a significant near-term pull-back in construction and manufacturing recession in 2020 with effects lingering in 2021. The extent of the decline in 2020 and the strength and pace of recovery will be based on how much the manufacturing and construction spend is temporarily deferred compared with spend put off indefinitely. Key industry analysts expect overall construction and manufacturing spending to contract in the mid-to-high single-digits range during 2021 and in the low-to-mid-single digits during 2022 as the delta variant wreaks havoc among the unvaccinated. Given that MM has a strong balance sheet and is profitable, and that vaccines for covid-19 are being rapidly rolled out around the world, the company is likely to weather this storm as well as any in the industry. It may even prove beneficial if other mining companies distressed assets could be acquired cheaply.★★
- **Regulation**: There are employment laws governing the hiring and firing of staff, benefits and social security contributions that businesses must be aware of, generally. Compliance tends to increase costs (e.g., time devoted to complying with mediation proceedings and money allocated to employment lawyers). There are safety and environmental regulations that differ between countries. These regulations may take the form of how mine tailings are disposed of and how much a government's royalties would be on every tonne of extracted ore. Noncompliance can be costly in terms of fines but is also a poor professional outcome that would reflect badly on the firm. ★
- **Exchange rate volatility**: A depreciation of a key exchange rate such as the US dollar will lead to exported raw materials being sold at a lower price (when converted back to Canadian dollars), depressing revenues and profits. Hedging is a way for MM to minimise or eliminate foreign exchange risk. Two common hedges are forward contracts and options. A forward contract will lock in an exchange rate today at which the currency transaction will occur at the future date. Hedging does not come without cost and would further add to the firm's costs. ★
- **Recruiting talented staff**: Success in the mining industry is driven in very large part by the talent a firm can acquire, train, and retain. One of the current issues facing the industry is that too few talented young people are attracted to the industry and those that are aggressively recruited by

competing mining firms. There are many key positions that MM must recruit, train and retain employees, including: project directors, drilling operations directors, project controls and site managers, engineers, geologists, metallurgists, and geophysicists. Anything that reduces the company's ability to compete for the best mineral and ore deposits will affect MM's ability to mine commodities and secure new contracts. ★★★

SUMMARY CONCLUSIONS

There are several strategic options available to MM that it could pursue to diversify into lithium mining. The case study posits three strategic options: acquire a new licence and develop a new mine in Australia, take over an existing Chilean producer, or form a joint venture with a Canadian producer. We evaluate diversification as a strategy and explore investment returns and finance options and consider the company's ethical objectives to determine the best investment option for MM in terms of lithium mining.

A diversification strategy is a practice where a firm enters an industry or market that is different from its core business. Reasons for diversification include (1) reducing risk of relying on only one or few income sources, (2) avoiding cyclical or seasonal fluctuations by producing goods or services with different demand cycles, (3) achieving a higher growth rate, and (4) countering a competitor by invading the competitor's core industry or market.

On each of the four above points, diversifying into lithium mining ticks all the right boxes. Firstly, lithium mining will bring in another revenue stream for MM, adding to its palladium, copper, gold and oil revenues within its mining division. When this is considered in the context of a multinational conglomerate, which is in its nature diversified across products and geographical location. Secondly, if the price of say copper falls, then stable or increasing lithium prices would support MM's cashflows. Having diversified mining operations allows MM to smooth its cashflows over volatile commodity cycles. For example, some years copper will be high and lithium low, and in other years lithium prices will be high and copper prices low. It is less likely that both copper and lithium prices will be low simultaneously. Thirdly, the forecast growth rate for lithium demand looks lucrative as the world transitions to a green economy and the lithium batteries much of this depends on (e.g., electric car batteries and wind and solar electricity storage). Finally, the acquisition of Chilean mining operations is by definition taking market share away from competitors, as the lithium revenues lost by one of MM's competitors is added to MM's revenues. An acquisition is when a company buys over 50% of the shares of another company and becomes the controlling owner. This increased market share is gained relatively quickly as mining operations are already established. Whereas the joint venture and 'go it alone' options will grow market share much more slowly as any new mining operation will take a much longer time to develop net positive cashflow and achieve profitability. A joint venture is where two or more business agree to work closely together on a particular project and create a separate business division to do so.

If the investment metrics look good for both strategic options, which is the option best suited to MM's desire to grow the company? There is the diversification strategy and the strategy to achieve scale. The case study points to only the Australian lithium option as achieving large scale. Economies of scale are crucial in the mining industry, with little to no control over the price of such commodities, profits are made by driving down unit costs (e.g., cost to produce a tonne of lithium) and expanding output – a high volume, low value approach. Acquiring the Chilean copper mine has the advantage of achieving positive net cashflows from the start of the investment. The developing a new mine and joint venture options will have negative net cash flows for years before the new mines come on line and start producing lithium in sufficient quantities to achieve positive cashflow and profits. The advantage of the joint venture is that risks are shared by both companies (although rewards are diluted); if the lithium joint venture fails then MM will only lose the cost of their investment, with the Canadian company sharing the loss.

Diversification strategies: new products, new markets and/or vertical integration. The firm can market to other consumer segments, diversify into new products, and diversify into new markets. Lithium is marketed to other businesses (business-to-business) such as car companies that require the raw material to manufacture their lithium-ion batteries. The fact that demand for lithium is anticipated to grow means that MM will be able to sell their new product into new markets (e.g., Japan, Korea and Germany) and to other market segments such as power generation companies looking to store the renewable energy they produce – keeping the lights on at night and when the wind does not blow.

Both Chile and Australia are far from the largest lithium markets in Asia, Europe and the US. If this distribution disadvantage can be overcome (increased scale perhaps?) then new geographic markets can be opened to the business and its products. Again, increased scale favours the Australian option.

To summarise lithium as a strategic option at this point; the Australian option confers economies of scale, the Chilean option is better for the cashflow position of MM's mining division, and the joint venture reduces the risk of the lithium investment, because that risk is shared by both companies.

Mining is long-term in nature with long investment horizons. MM has been mining for a long time and would be well practiced in financing new mines and have experience in managing cashflow across the timeline of any such investment. There are several options available to MM to finance the long-term Australian lithium investment. As a public limited company, MM could sell additional shares to finance this expansion. While this would dilute the ownership and control of its current major shareholders, it has the advantages of never having to be to be repaid, dividends do not have to be paid every year (in contrast, interest must be paid as and when demanded debt is used as the source of finance), and much larger amounts of finance can possibly be raised than through debt financing (developing a new mine is a large sum to finance – likely in the billions of dollars).

MM also has the option to offer its own bonds or debentures into the market for company debt. Large amounts can also be raised in this manner, interest rates are historically low and repayments can be made over a long time (30 years would not be uncommon for a large issuance).

A final option would be to divest itself of its environmentally damaging oil assets. The sale of which my fully or partially finance the expansion into lithium mining. Oil is polluting and lithium is needed to power the green revolution. The combination of exiting the oil industry and entering the market for lithium burnishes the company's green credentials, especially if the mining of lithium can be achieved in an environmentally sustainable way. This would be considered another driving force for the Australian lithium investment. Australia is an enormous, dry and sparsely populated country. Thus, lithium mining is much less likely to negatively impact local communities and local water sources. Investment is the latest 4.0 mining technologies would further reduce the new mine's environmental impact. Retrofitting the Chilean mine with such technologies would be more difficult to incorporate into operations than starting from scratch.

Although in many cases the uptake of these technologies is driven by the potential to improve efficiency and competitiveness, they also help reduce the environmental impact of mining activities. Most of these technologies also have application beyond mining and can support linkage development to other sectors of the economy. Such 4.0 technologies include automation, remote control, electrification, renewable energy, digitalisation, and remote sensing, with specific attention being paid to both environmental and economic benefits. Thus, an innovative and large-scale Australian lithium mine would be highly efficient and productive, while aligning with MM's objective of strengthening ethical values throughout the company.

Taken together, with new technologies incorporated into operations, the Australian option would be highly productive and achieve economies of scale, boosting profitability over a much longer period, while simultaneously shifting the company towards a more sustainable and ethical future, especially if oil assets are divested to fund this. We recommend that the company devotes further resources to examine the feasibility of this strategic option and examine financing options.

*Source: www.**Business**Management**IB**.com*