



# CFA Institute

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## CFA Institute Research Challenge

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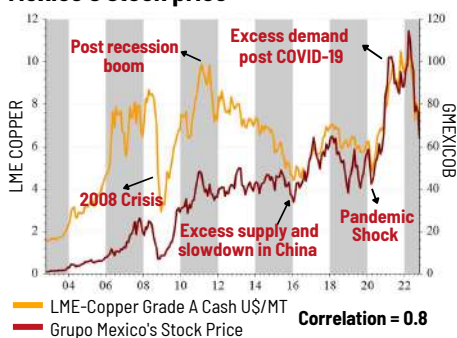
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**Figure 1. Valuation summary**

Recommendation: BUY	
Target price	MXN 88
Current price	MXN 71
Upside	24%
Market Cap (m USD)	27,946
Shares Outstanding (m)	7,785
EPS 2021	MXN 10.9
52-Week High	MXN 122
52-Week Low	MXN 61
P / E (LTM)	8.6x
EV / EBITDA (LTM)	4.5x

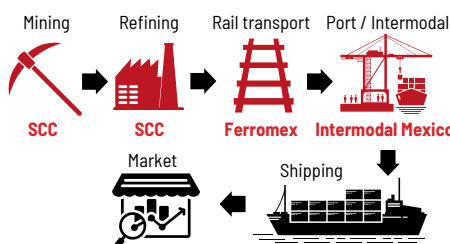
Source. Team Analysis, Capital IQ

**Figure 2. LME copper price & Grupo Mexico's stock price**



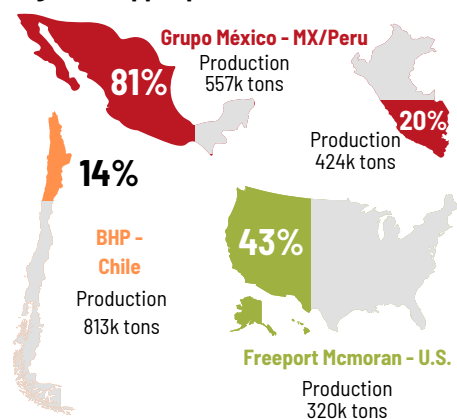
Source. Refinitiv, Team Analysis

**Figure 3. Mining Value Chain and Grupo México subsidiaries' vertical integration**



Source. McKinsey, Company Data

**Figure 4. Grupo México vs competitors Regional copper production market share**



Sources. Statista, Capital IQ, Company Data, Team Analysis

## BRIEF

Grupo México is a Mexican conglomerate and the biggest copper producer in the country. It operates three divisions: Mining, Rail Freight, and Infrastructure. We believe Grupo México has solid competitive advantages that will help the company withstand an uncertain macroeconomic landscape and take advantage of future copper demand trends.

## INVESTMENT SUMMARY

We issue a **BUY** recommendation for Grupo México with a twelve-month target price of MXN 88, offering a 24% upside to its November 3rd, 2022, MXN 71 closing price (Figure 1). Our target price is based on a Sum of the Parts Discounted Cash Flow model (SOTP DCF), supported by Real Options, Monte Carlo, and Relative Valuation models. In our view, the following key value drivers support our recommendation: 1) Grupo México's economic moats related to vertical integration and cost advantages, 2) the company's position to capture copper demand catalysts, and 3) rich mineral resources derived from geographical domination.

### Cost advantages come from conglomerate segment integration

We believe the market does not fully appreciate the value of Grupo México's entire network of integrated operations by considering copper prices as the company's sole value driver. Although copper prices certainly influence Grupo México's performance, cost advantages become crucial to remain profitable in a competitive commodity market with no economic cartels to control price volatility. Thus, we believe vertically integrated mining operations and corporate segments provide value to Grupo México's corporate structure by allowing it to capture the highest EBITDA margins in the industry (Figure 24). Regarding Grupo México's mining division integration, since each activity in the mining industry's value chain involves highly specialized processes and unique resources, Grupo México effectively reduces intermediary firms' bargaining power by owning mining and metallurgical complexes. Likewise, regarding Grupo México's corporate-level vertical integration, the company partially employs rail and infrastructure divisions to support mining operations. For instance, the Ferromex rail subsidiary transports and positions copper cathodes throughout several ports and intermodal terminals, and infrastructure subsidiaries develop engineering projects needed to construct new mines (Appendix 10). As a result, this strategy lowers mining-related operating costs and makes the company more profitable in times of high mineral prices. Compared to competitors, Grupo México has more control over its value chain due to the extensive reach and size of its business segments. Since copper prices are expected to increase long-term, given global demand drivers (as mentioned below), we believe Grupo México will position itself as one of the most profitable companies in the copper industry through cost advantages from vertical integration (Figure 3).

### Positioning to capitalize on global copper catalysts

Copper is a widely used base metal with no other considerable quality-comparable substitutes because of its particular electrical conductivity properties (Appendix 11). As such, world economies will increasingly demand copper in the following years due to: 1) the global transition to green energies, 2) the global trend to digitize and enhance day-to-day activities via smart cities' technologies, and 3) demographic trends and increasing global urbanization that will expand the manufacturing and construction industry of emerging markets. Since the price of copper greatly influences Grupo México's share price (Figure 2) and significantly affects the company's overall operating performance, it is essential to consider copper industry catalysts as the company's future performance drivers. Moreover, we believe the market underestimates the broad involvement of copper in future macroeconomic dynamics. We think the copper industry and copper uses in economies will be different from past decades (Figure 11). Consequently, we argue that Grupo México will capitalize on these three drivers through extensive economies of scale and vertical integration-related cost advantages.

### Relative size on local markets gives the company a unique domain

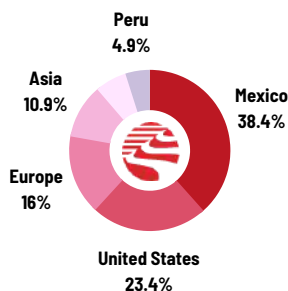
Grupo México holds the largest copper reserves in the industry because of geographically concentrated assets that enable the company to extract value regionally instead of competing for a bigger global market share. Specifically, Grupo México holds exclusive concessions in Mexico and Peru, which allow for local production domination and access to valuable mines with richer natural resources that the competition cannot fully match (Figure 15). For instance, according to Bloomberg, the Buenavista del Cobre mine, located in Sonora, Mexico, is the world's largest mining complex controlled by a single operator. Accordingly, that allows Grupo México to be the fifth largest copper producer in the world while producing 81% of Mexican copper (Figure 4). We believe investors mainly focus on mining players' global market shares rather than their relative size on local markets, underestimating specific geographical domain. Therefore, we think the concession-protected value of holding the largest copper reserves while dominating Mexican copper production is an essential economic moat for the company, that will enable them to take advantage on copper demand catalysts.

**Figure 5. Grupo México's main subsidiaries by division**



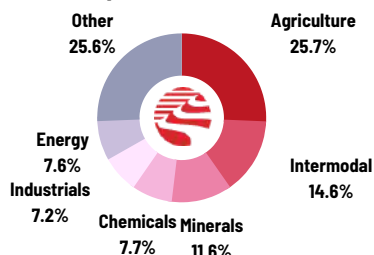
Source. Company Data

**Figure 6. Revenue by geographical region**



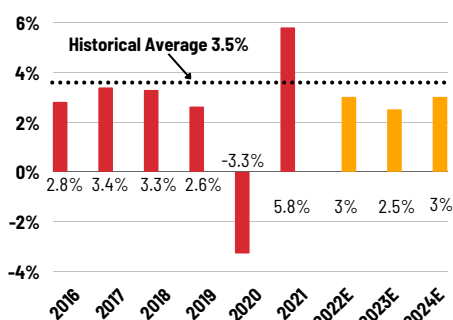
Source. Company Data

**Figure 7. Revenue by segments - Grupo México Transportes**



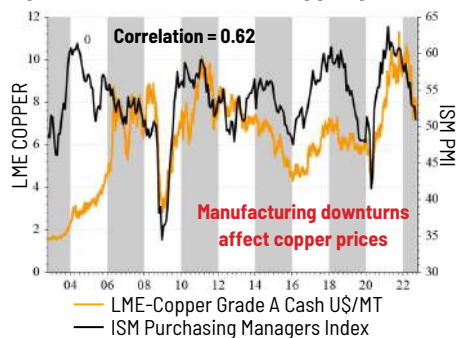
Source. Company Data

**Figure 8. World real GDP growth consensus estimates**



Sources. World Bank, IMF, OECD, Analysts' consensus and Team's calculations

**Figure 9. ISM PMI Index & Copper prices**



Source. Refinitiv, Team Analysis

## BUSINESS DESCRIPTION

Grupo México, headquartered in Mexico City, is the fifth-biggest copper producer in the world and the fourth-biggest Mexican company measured by market capitalization in the Mexican Stock Exchange (BMV). Its stock has been trading on this exchange since 2000. As a conglomerate, it employs over 29 thousand people across its three divisions: Mining, Rail Freight, and Infrastructure (Figure 5, Appendix 7). Its business model consists of producing copper cathodes (copper refining end product) by extracting and refining copper in Mexico, U.S., and Peru, in addition to selling zinc, molybdenum, silver, and other metals as byproducts. Copper mining significantly drives Grupo México's operating performance and revenues (Figure 22). In addition, Grupo México's Rail Freight segment operates the most extensive rail fleet in Mexico. Its Infrastructure segment holds several contracts and concessions for engineering, procurement, construction, and drilling services. Both of these divisions operate mainly in Mexico.

**Mining.** The mining division, which accounts for 81% of Grupo México's sales, is managed by the Americas Mining Corporation (AMC) subsidiary. Within AMC, copper accounts for 85% of mineral sales. This subsidiary also coordinates two mining firms: Southern Copper Corporation (SCC) and American Smelting and Refining Company (ASARCO, Inc.). Regarding SCC, it is the most significant subsidiary of AMC; its stock trades on NYSE, and it operates mines in Mexico and Peru (Appendix 1). On the other hand, ASARCO manages mining operations in Arizona, US. Furthermore, AMC has a considerable international reach by selling metals on three continents: America, Europe, and Asia (Figure 6).

**Rail Freight.** The Rail Freight division (which accounts for 16% of Grupo México's revenues) is managed by the subsidiary GMéxico Transportes (GMXT), which is also separately listed on BMV. Although it coordinates several firms, the most crucial subsidiaries for GMXT's operations are Ferrocarril Mexicano (Ferromex) and Ferrosur. These firms operate in Mexico and transport various types of merchandise (such as agricultural, intermodal, chemicals, minerals, and industrials) across several ports and intermodal terminals (Figure 7). Furthermore, GMXT operates more than 800 trains and more than 11,000 km of rail tracks across the U.S. and Mexico.

**Infrastructure.** The Infrastructure division, which accounts for 3% of the corporation's revenues, is managed by Mexico Proyectos y Desarrollos subsidiary. It leads various industrial projects in Mexico, which include leasing oil rigs to state-owned oil company Petróleos Mexicanos (PEMEX), building and designing energy plants to sustain mining and transport operations, and managing toll roads. Nonetheless, its purpose is to aid mining and transport operations.

**History.** Grupo México was founded in Mexico as a construction company in 1942 by Jorge Larrea Ortega. However, in 1961, as the government required mining companies to have national-majority ownership, Jorge Larrea gradually obtained control of important mines in Cananea and Nacozari in Sonora, Mexico, eventually transforming the company into a predominantly mining corporation. Southern Peru Copper Corporation started trading on the NYSE in 1996 before Grupo México acquired it in 2004. Then, Ferromex, formerly a state-owned company, began operating as part of Grupo México in 1998 following the company's privatization. Subsequently, in 1999, Grupo México became an international company with the acquisition of ASARCO. Later, in 2000, Grupo México started trading on the Mexican stock exchange. Henceforth, the company acquired subsidiaries to consolidate its corporate divisions. Presently, Grupo México is waiting for government authorization to acquire Planigrupo (a Mexican construction and leasing shopping center firm).

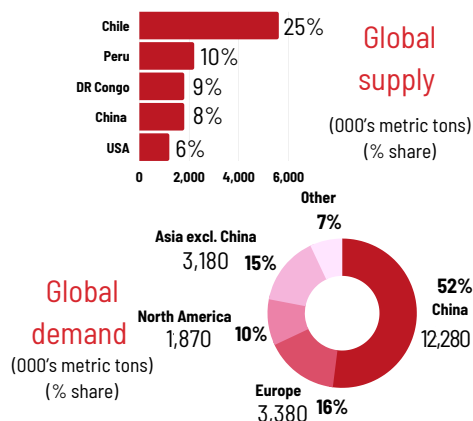
**Company Strategy.** Within the copper market, there is intense competition and no legal, economic cartels (as with OPEC) to control copper prices. Additionally, the value of flexibility is low as there are heavy fixed costs related to large mining equipment assets. Therefore, the company's strategy is to be a leading player in worldwide copper production through cost strategies related to vertically integrated operations and regional production domination. By doing so, the company looks to maintain greater control of the value chain (Appendix 10). Grupo México also aims at geographical production concentration and corporate division-based industry diversification. Since the company does not use derivatives to hedge against commodity price fluctuations, the company relies on managing low costs.

## INDUSTRY OVERVIEW & COMPETITIVE POSITIONING

**Macroeconomic global uncertainty.** Mining, rail freight, and infrastructure are cyclical industries sensitive to macroeconomic dynamics, which, in turn, influence Grupo México's financial performance. Thus, it is crucial to analyze current global circumstances expected to affect economic growth (Figure 8, Appendix 4). Presently, economies worldwide have struggled to recover from the pandemic in the last two years, given: (1) rising global inflation due to supply shocks and supply chain bottlenecks, (2) a war between Russia and Ukraine that triggered an energetic crisis in Europe, and (3) rising interest rates from central banks worldwide due to restrictive monetary policies, threatening to slow consumption and, thus, economic activity. Therefore, we expect these factors to impact economic conditions and copper prices near-term.

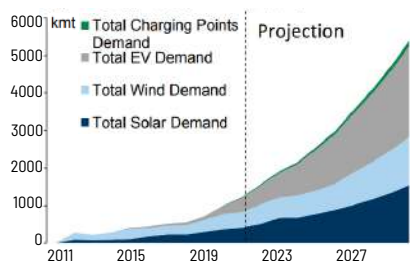
**Dr. Copper's insights on macroeconomic health.** Copper prices are affected by the booms and busts of the business cycle because copper is a base metal used in several businesses dependent on macroeconomic conditions, such as construction and manufacturing (Appendix 11). In recession periods, as observed in 2008 and 2020 (Figure 2), copper prices faced severe downturns. This relationship affects copper prices and is reflected in the ISM PMI Index, which has a delay compared to copper, as slowing manufacturing subsequently affects copper prices (Figure 9). Conversely, copper prices also tend to increase in post-recession periods. For example, after the 2008 financial crisis, copper prices more than doubled as emerging market countries recovered from the recession. Likewise, copper prices increased rapidly in 2021 due to the post-COVID-19 supply disruption and greater demand for electronics manufacturing. Although

**Figure 10. Top copper producing countries & Global demand by country**



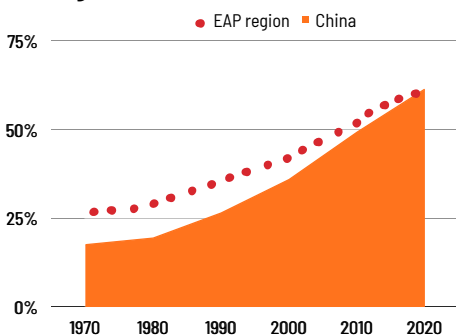
Source. Statista, Bloomberg Intelligence

**Figure 11. Expected worldwide green copper consumption by end use**



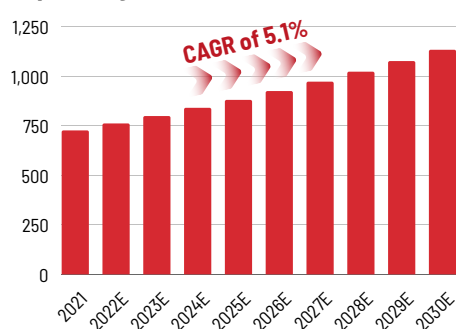
Source. Wood McKenzie

**Figure 12. Urban population (% of total) in EAP region and China**



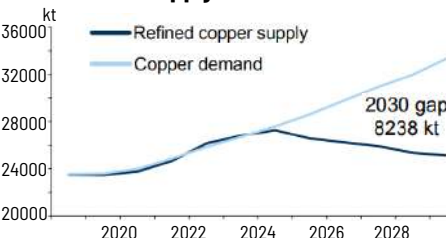
Source. World Bank

**Figure 13. Consumer electronics industry expected growth (USD Billion)**



Source. Precedence Research

**Figure 14. Expected worldwide copper demand and supply**



Source. Wood McKenzie

the 2021 boom in copper prices has reversed this year as macroeconomic expectations have deteriorated, according to Data Bridge Market Research, the copper industry is still expected to increase at a 5.1% CAGR between 2022 and 2029.

**Chinese dynamics' effects on copper prices.** In recent years, China has demanded a big part of the global supply of copper. Specifically, by growing its exportation-focused manufacturing and increasing its real estate industry, given rapid urbanization and population growth, China has driven copper prices in recent decades as it has become the biggest purchaser of copper. According to Bloomberg Intelligence, China demands approximately 52% of the worldwide copper supply (Figure 10). Periods of low Chinese copper demand also impact the copper industry; for example, in 2015, copper prices were down 20% for the year due to slower Chinese economic growth (Figure 2). Additionally, copper demand has currently been negatively affected by two key global events related to this Asian country:

- China facing slower economic growth due to past COVID-19 lockdowns, which ended up closing factories and delaying manufacturing in the country, and
- China's real estate industry facing a slowdown due to high leverage in the sector and the default of significant companies in the industry, such as Evergrande.

**Copper demand catalysts.** As copper wide-broad use is here to stay, we expect copper demand to increase in the long term apart from the mentioned short-term economic risks. We believe copper is a base metal that will be extensively used in more areas in the future compared to the last decades. Thus, the following trends in the copper industry are important catalysts for Grupo México's future performance:

**1) Green Transition will require copper.** One of the main drivers of future copper demand is its future use on green energies. Because of its electric conductivity properties, copper is a commodity heavily used in green technologies (e.g., electric vehicles, wind energy, and solar energy). In addition, there are no close substitutes for copper in conductivity, the closest one being Aluminium, which is less conductive than copper (Appendix 8). Global copper supply will be increasingly demanded as the world transitions to sustainable energy sources (Figure 11).

**2) Urbanization trends will increase copper demand.** According to World Bank data, expanding urban land consumption is expected to add 1.2 million km<sup>2</sup> of new metropolitan built-up area globally by 2030. Since copper is used in wiring and plumbing, copper demand will increase accordingly. Furthermore, according to World Bank analysts, the East Asia and Pacific (EAP) region is experiencing rapid urban growth, second only to Sub-Saharan Africa, because of constant Chinese urbanization (Figure 12). That is, Chinese cities lead the region in average growth by area (3.3 percent per year). Since China, as mentioned, currently leads world copper demand, this increased urbanization will increase copper prices as well. We also expect new technologies used in urbanization, such as smart cities and Internet of Things urban devices, to increase copper demand because of its use as electric conductor. Technology-enhanced renovation of cities will be important for future copper demand.

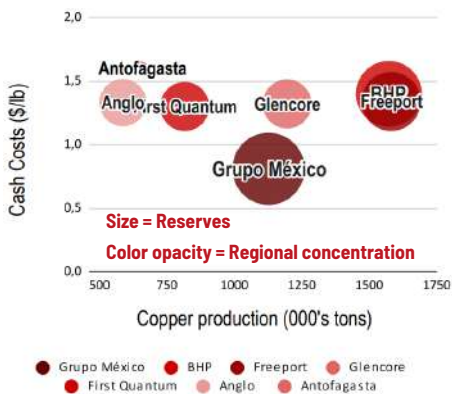
**3) With Digital-era technologies come electrical components.** The consumer electronics industry has constantly been developing new technologies, such as artificial intelligence, 5G connectivity, smart devices (e.g., mobile phones, gaming consoles, and home appliances), cloud services, and virtual reality. As the industry is expected to grow annually by 5.1% (CAGR 2022-2030), according to Precedence Research, and 14% of copper usage is destined for electrical equipment, increased demand for consumer electronics will increase copper prices (Figure 13).

**Tight copper supply-side.** The systemic fluctuations in the mining industry will impact copper supply (and copper prices) primarily due to the delay of copper production in response to prices. This setback occurs because mines' exploration-permit-construction processes last five to ten years, in addition to political, operational and environmental constraints, as seen in our PESTEL analysis (Appendix 9). Copper industry CAPEX is expected to grow only slightly in the next five years (Appendix 11), and increased production will be reflected some years later. Therefore, the global copper supply will not be able to adjust fully to the worldwide demand drivers mentioned above. Consequently, there will be a copper supply deficit in the next decade (Figure 14).

**Global copper rivalry.** Grupo México has one of the most sizable copper mining operations, being the fifth largest copper producer in the world (Appendix 11). The copper mining industry is highly competitive among existing rivals, as ten companies control nearly 80% of worldwide total copper production (Grupo México holds a 7.2% global market share). Therefore, we believe Grupo México is appropriately comparable using global competitors, given its international reach. These include Freeport McMoran, BHP Billiton, Codelco, Rio Tinto, and Glencore International. These companies are horizontally and vertically integrated because they extract various minerals and manage mineral-refining installations, in addition to operating in other industries. Closest competitors focus mainly on having a diversified metals production. Regarding Grupo México, the company specializes in vertical integration in both its mining and corporate divisions (i.e., uses the energy provided by its Infrastructure division assets for its mining operations and transports its goods through its Rail Freight division). Another crucial competitive difference for Grupo México is its greater regional dominance over its competitors. Grupo México controls 81% of Mexico's production and 20% of Peru's production (Figure 4). Although Grupo México does not have the largest global market share, the company has production dominance in its key regions. These competitive advantages make Grupo México the most regional-dominant and cost-effective firm in the industry (Figure 15).

**Cash Costs are essential in the copper business.** Profit margins in the copper industry are moderate because, as mentioned, the rivalry between existing players is intense, forcing firms to compete on cost advantages. Specifically, firms compete based on the net cash costs metric.

**Figure 15. Copper production, Cash costs, Regional production concentration & Reserves size vs competitors (2021)**



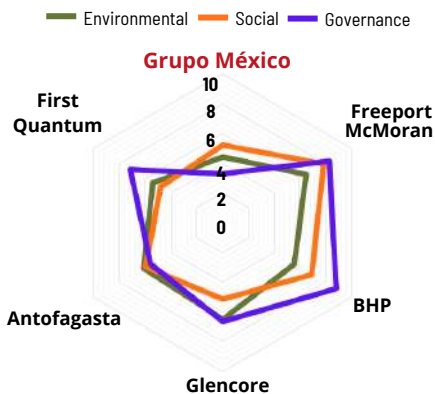
Source. Bloomberg Intelligence, Capital IQ, Team Analysis

**Figure 16. US-Mexico Rail Freight & GMEIXICO Transportes revenue**



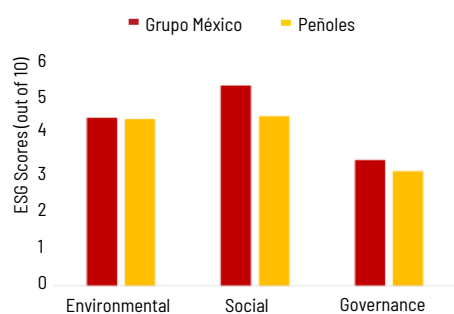
Source. Bloomberg Intelligence, Team Analysis

**Figure 17. Grupo México & International Peers - ESG Comparison 2021**



Source. Bloomberg

**Figure 18. Top Mexican Mining Companies - ESG Comparison 2021**



Source. Bloomberg

Southern Copper Corporation, subsidiary of Grupo México, has the lowest net cash costs compared to competitors as a result of the conglomerate vertical integration (Appendix 11). The net cash cost of a mining firm is the total operative cost of extracting a ton or pound of a selected mineral, considering byproducts' salvage values. For instance, Grupo México, which focuses on extracting copper, subtracts its byproducts' market value from its copper cash cost (Grupo México's main byproducts are molybdenum, silver, and zinc).

**Rail Freight outlook.** The Mexican railroad industry changed since the government privatized it in 1995 through concessions. Yet, it remained relatively undisputed compared to mining (lacking firm competition) because of two main entry barriers: heavy capital investment requirements (locomotives and wagons, for instance) and limited permits given by the government (Appendix 8). Therefore, 81% of the available operating tracks are divided between two players: Kansas City Southern and Grupo México Transportes (GMXT). To increase competition, the government allows tariffs and transit rights between firms' rails, despite concessions providing 30 years for the exclusive use of rail routes (Appendix 2). International trade (followed by infrastructure investment) is the rail freight industry's main driver because free trade allows higher volumes of goods to be sold and transported across ports and intermodal terminals. Grupo México operates in the Mexican rail freight industry through Ferronormex and Ferrosur subsidiaries. These companies benefit directly from the government's free trade agreements, as seen in the latest trends in US-Mexico rail freight trade (Figure 16), since they increase foreign investment and commercialization in the country. Specifically, for example, the United States-Mexico-Canada Agreement (USMCA) incentivizes the growing presence of the automotive industry in the country. Since trains are the preferred means of transporting automobiles (i.e., seven out of ten cars produced in Mexico are transported through railroads), rail freight subsidiaries benefit directly. For that reason, infrastructure investments also help strengthen trade by improving train speeds and cargo capacity. Furthermore, it is important to note that although rail freight has been acquiring more significance in the ground transportation sector, it still has a relatively low market share (19%) compared to truck freight (81%), according to U.S. government data.

**Infrastructure outlook.** Grupo México's infrastructure division operates only in Mexico. Mexico's infrastructure industry is recovering from the pandemic, supported by public investment in large projects such as the Mayan Train and the Dos Bocas Refinery. However, despite having trade agreements with North America that boost foreign investment in the country, there has been policy uncertainty in recent years mainly because the government has been conducting nationalistic policies that aim to strengthen state-owned firms in the energy sector, such as Petróleos Mexicanos (PEMEX) and Comisión Federal de Electricidad (CFE) in oil and electricity markets, respectively. Since Grupo México uses its infrastructure division assets to provide energy to its mining division (as seen in Investment Summary), eliminating self-supply contracts by governments would mean higher operating costs. In addition, Mexico has historically invested less than 4% of its GDP in infrastructure, which is less than recommended by the Economic Commission for Latin America and the Caribbean (ECLAC) for sustainability purposes.

## ENVIRONMENTAL, SOCIAL & GOVERNANCE

There are several factors that Grupo México needs to take into consideration when being evaluated under ESG principles. For instance, with environmental concerns recently demanded by investment funds and communities, mining companies are urged to develop greener technologies and be more responsible with their pollution and waste disposal systems. Comparing Grupo México with its international peers shows that they score below average (Figure 17). Yet, it is important to consider that Mexico is still behind in ESG metrics and valuations relative to other countries. Therefore, we compared Grupo México with other top Mexican mining companies and found that Grupo México scored better in each category (Figure 18). Grupo México has also implemented different measures that have proven successful each year (Figure 20). Furthermore, we included the ESG evaluation impact in investment risks and scenario analysis.

### Environmental

**Climate Change.** An important aspect that Grupo México needs to consider is climate change. Both the mining and transport industries have been recognized as the segments that most threaten and impact climate change by being part of industries that produce greenhouse gas emissions. Grupo México has reduced its emissions by 1.5% since 2018; nevertheless, in 2021, there was a rise due to higher emissions on cargo trains in the transport division. Moreover, there is a negative issue to consider while evaluating Grupo México's performance in the environmental analysis: Grupo México's 50.7% of Diesel emissions (from its total operations) came from its locomotors and mining trucks. That said, Grupo México issued a plan (already being carried through) to reduce these emissions in the long run, aiming to substitute 20% of their fleet with new locomotors able to reduce carbon footprints and increase efficiency. By doing so, they would be reducing 230 thousand tons of CO2 emissions generated by the company, which accounts for approximately 8% of their current emissions from mobile sources (e.g., trucks and trains). These actions imply that the company is considering what it can do better and acting upon it.

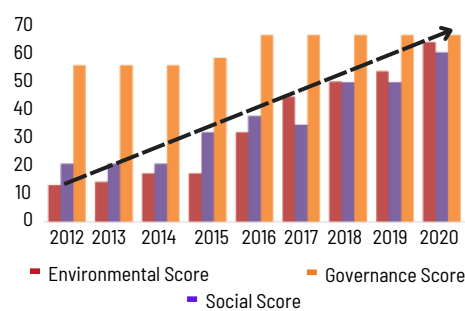
**Clean energy.** Moreover, a factor that positively positions the company is that its green energy projects will allow the company to reduce 21.1% of its total greenhouse gas emissions (Scopes 1 and 2). Since 2017, the corporation has shown decreasing scope-two gas emissions due to energy from renewable sources used in their operations (which nowadays represents 22%). In addition, this percentage is expected to rise to 25% in 2022 due to the new Fencias wind farm, which will reduce their emissions by 300 thousand tons of CO2 (Representing 5.2% of their total operational emissions). However, in the latest quarterly report, the group disclosed that it has not yet started operating this new plant since they need government approval. That, in turn, shows a minimum lag in what they say they will do and how it comes to fruition; it could result in a negative market perception regarding their credibility and reliability.

**Figure 19. Relative ESG**



Source. Bloomberg

**Figure 20. Historical ESG Scores**



Source. Bloomberg

**Figure 21. Company's Ownership**

Top Ownership Type (%)	
Individual	49.34%
Investment Advisor	48.9%
Bank	0.81%
Sovereign Wealth Fund	0.64%
Insurance Company	0.11%
Holding Company	0.08%
Pension Fund	0.04%
Endowment	0.03%
Hedge Fund Manager	0.02%

Top Individual Owners	
Mota - Velasco German Larrea	
Rocha Oscar Gonzalez	
Cesar Perez Alfredo De Jesus	
De Quevedo Topete Xavier Garcia	
Tejada Leonardo Contreras Lerdo de	
Lalalde Psihas Julian Jorge	
Ruisanchez Raul Jacob	
Sacristian Carlos Ruiz	
Aguilar Edgar Corrales	
Wilca Lina Vingerhoets	

Source. Bloomberg

**Reputation risk from communication transparency.** Still, the company has sometimes shown a lack of clearness regarding waste spills and the lack of disclosure of these matters with their investors. In addition, no evidence demonstrates how or if the company made any efforts to evaluate how the local communities were affected by chemical spills, nor did they show any interest in following up on the situations and how they could repair the damage inflicted by them. That is a recurrent conduct that the company has shown through the years. Therefore, this lack of transparency and disclosure has affected the company's reputation over the years.

**Social**

**Human rights.** Grupo México has been part of the human rights evaluation held by the Corporate Human Right Benchmark since 2019. In 2020, the organization graded the company with 13 out of 26 points, which meant they were above average in their sector. Moreover, Grupo México's 2021 report shows a shift in the disclosure of specific processes of due diligence and the inclusion of policies that enable a more inclusive workplace with no discrimination permitted. Additionally, it reported an increase in women's participation since 2016, and its metrics show equal salary retribution between both genders. All of these actions have enabled the company's mining division to obtain the certification of "Great Place to Work"; these changes demonstrate the company's commitment to the groups of interest and an increase in considering the importance of labor human rights and implementing those changes.

**Health and safety.** However, there are also negative social aspects that affect the social evaluation of the company. For instance, the workforce's health and security is a factor that negatively impacts the company. That is because there have been no changes in the past five years in the mining and infrastructure divisions' disabling accidents rate (LTIFR). Considering the Cananea 2006 incident (death of 65 miners), there were strikes in both Sonora's mines for approximately five months, which resulted in a decreased copper production of 26.3% (shown in their second quarter 2006 report) compared to the previous year. Nowadays, this negatively impacts the external social image of the company and its investors, since there is no recorded improvement in the health and safety aspect of their workers, even though they have implemented different policies directed towards addressing this issue. Additionally, there are no protocols for monitoring and evaluating the effectiveness of the actions taken by the company in response to the impacts and risks on the workforce, human rights, or local communities.

**Governance**

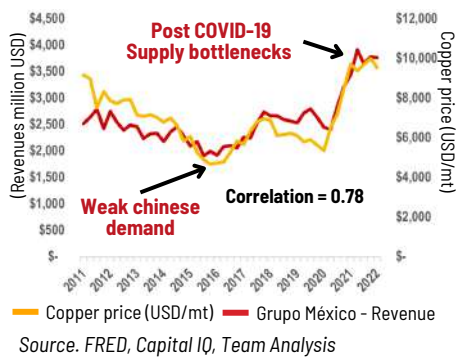
**Board of directors.** When analyzing this factor, we noticed that the CEO is also the Board's Chairman, which is a negative aspect since it qualifies as a conflict of interest or agency problem. Another characteristic that stands out when analyzing the board of directors is the lack of rotation amongst its board members (currently, the board members rotate every 12 years) and the average tenure of its members (19.7 years). Lastly, another factor that negatively positions the company regarding governance is that there are no women board members (Appendix 6), which exposes them as a non-diverse nor inclusive board in the industry (Figure 19).

**Family business.** The company started with Jorge Larrea as the company's CEO and Chairman. Eventually, before passing away, he left his company to his eldest son, Germán Larrea, also currently CEO and Chairman of Grupo México. That demonstrates the typical behavior amongst business people in Mexico, where the business is traditionally passed on to family members. Thus, analyzing whether this trait will persist in the upcoming years is highly relevant since this traces the future of the company. Therefore, we aimed to research the probability of whether the future owner of the company would also be a family member and verify if this person is acquiring the appropriate qualifications to undertake this responsibility. However, when doing so, there was little information regarding this matter; yet, public media has speculated that German Larrea's nephew, Fernando López Guerra Larrea, will be the next corporate CEO. Moreover, besides German Larrea, there are two family members out of 14 Board members and three directors who are part of the founding family across the senior management team (mining, transport, and infrastructure). Regardless, when analyzing their credentials, it is seen that they have the proper studies and qualifications to undertake such roles (Appendix 6).

**Family ownership.** Another aspect considered when analyzing this ESG segment was the family's total ownership compared to other large Mexican companies. We included this in the analysis because most public Mexican companies are family-owned and operated; therefore, the family ownership comparison amongst other Mexican companies was relevant regarding proper governance. The companies which were used in this comparative analysis were Peñoles (Bailleres family), Grupo Carso (Slim family), and Grupo México (Larrea family). The total ownership of their companies was approximately 70%, 80%, and 60%, respectively. Therefore, despite all companies having a high percentage of family ownership, Grupo México has the lowest family-ownership rate out of the three most influential public Mexican companies. Consequently, this results in Grupo México having a positive positioning in governance compared to its sizable Mexican peers.

**Corruption.** Past reports of Grupo México have stated that the company has not been exposed to corruption news since 2017. However, an existing risk challenges this statement; this is the eight-year issue around the toxic spills in Sonora and Bacanuchi rivers. The matter in question has not been resolved. It can be related to corruption suspicions since Grupo México has not fully complied with an agreement establishing a trust fund to remedy the damages created. Specifically, there are still unfinished projects (stipulated in the trust fund), and journalists have also found discrepancies regarding the fulfillment of such documents. Consequently, this damages the company's reliability and transparency, which was taken into account in our valuation as an investment risk in our bear scenario.

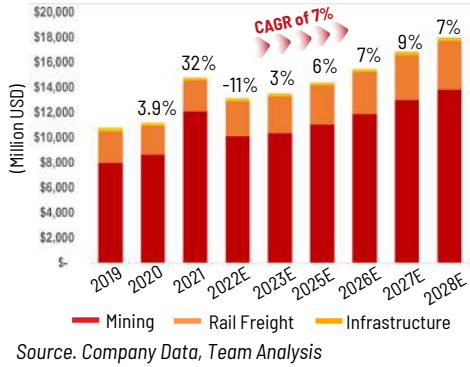
**Figure 22. Grupo México revenue & copper prices**



**FINANCIAL ANALYSIS**

**Revenue Cyclicality.** Copper prices substantially affect overall revenues and profits, tying the company's financial performance to the commodities market and the business cycle. Despite Grupo México being a conglomerate, most of its revenue comes from the mining segment; thus, the company's sales depend on copper prices (Figure 22). For instance, in 2015, Grupo México's revenues decreased by 12%, most of which came from lower copper prices over the year due to weaker Chinese demand. However, revenue growth recovered from 2017 to 2020 and accelerated in 2021 to 35% YoY growth as copper prices increased due to higher copper demand and supply disruptions, as COVID-19 restrictions eased, which we think represented a one-year outlier. Our revenue growth forecast for the mining segment is based on estimating reserves depletion and future production, depending on individual mine's estimated production life (Appendix 5). In addition, we used price inputs for minerals from futures curves from exchanges, such as CMX and LME. Starting from 2026, we used the historical average nominal growth rate in mineral prices and decreased it to 2% in 2031, reflecting average expected inflation. Overall we expect revenue growth to slow down in the next two years as macroeconomic conditions affect copper prices in the short term. Nonetheless, we expect revenue growth to recover long-term as macro conditions improve and the company benefits from copper industry catalysts. In addition, we expect Rail Freight and Infrastructure divisions' sales growth to decrease in the next two years, as slower economic growth also affects both segments. As a result, we expect total revenue to grow at an average CAGR of 7% in the next five years (Figure 23).

**Figure 23. Grupo México consolidated revenue forecast & YoY change %**



**Cost control leads to large expansions in margins.** In recent years, Grupo México has led among its main peers in profitability (Appendix 3). Its net margins show the benefits of economies of scale and cost diversification within the company, especially in periods of economic stress or lower copper prices. Therefore, we expect the company to outperform its competitors in the coming years, continuing this trend (Figure 24), assuming the historical difference in margins continues as the company has solid competitive advantages. As a result, we estimate that the company's EBIT will have a decrease of 53% in 2022, mainly due to an impact on the level of copper prices derived from current macroeconomic conditions and higher inflation, to subsequently have a recovery of 19% and 22% in 2023 and 2024, respectively; and then continue with conservative 2% growth going forward. Historically, the company has shown a better performance than its competitors when copper prices rise due to its cost advantage. In addition, given the company's greater control over the value chain and higher fixed costs, it can benefit, especially when copper volatility is positively skewed. Starting in 2027, given the increase in demand for copper and the decrease in CAPEX, we expect that Grupo México's profitability will lead the mining industry as we expect the company's solid economic moats to last for a time.

**Figure 24. Grupo México expected EBITDA margins vs. Peers**

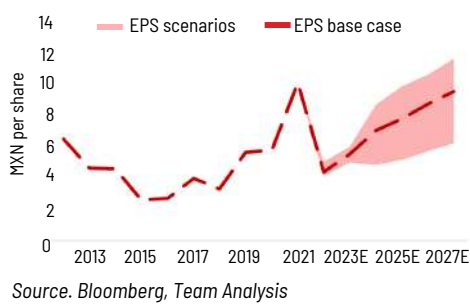


**Satisfying mining shareholders with returns with less risk.** Vertical integration has allowed Grupo México to have a better ROE than the industry average (Appendix 3). Although this will decrease in the coming years, we expect that it will recover comparatively faster than the industry to 14% in 2024 and remain constant until 2027. The company has a higher average historical ROIC than competitors (11.3% vs. 7.5%), which reflects profitable investments in mines with greater natural capacity. Furthermore, we believe that the cost strategy, coupled with a strong funding profile, will lead to net margin expansion to deliver to shareholders an EPS of 13.8% 2022E-2027E, reaching MXN 9.5 at the end of our projection (Figure 25).

**Copper extraction will outlast competitors.** We believe Grupo México has above-average metrics that are significant in the mining industry. The company's dominance in Peru and Mexico, protected by government concessions, allows them to have exclusive use of the largest reserves in the copper industry, which represents an invaluable asset for the company (Figure 26). This competitive advantage will allow them to extract more copper for an extended time, resulting in a longer estimated mine life. The average remaining term of Grupo Mexico's concessions in Mexico is approximately 17 years, resulting in the company being safe for the next decade; in addition, concessions are renewable for another term. Furthermore, compared to the competition, these richer natural resources give them an edge in satisfying future demand. We expect the company to have an average production growth of 5% (Appendix 5)

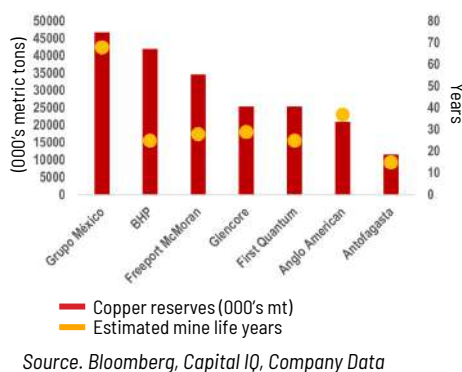
**Segment-integration compensates low ore grades.** Another important metric in the industry is the ore grade, which refers to the percentage of pure ore obtained from the total mineral mined. As Grupo Mexico's mines are older than the competition, the company has a lower ore grade than the industry's average (Figure 40), implying higher costs to extract each ore unit. Nevertheless, vertically integrated operations lower extraction costs by a greater magnitude (i.e., holding the industry's lowest cash costs, as seen in Figure 15). Therefore, the low ore grades impact is mainly on reserve size. Cash costs in the copper industry have been increasing due to inflation, impacting extraction costs; nonetheless, Grupo Mexico's cash costs are still below the 5-year industry average (Appendix 11).

**Figure 25. Grupo México EPS forecast**

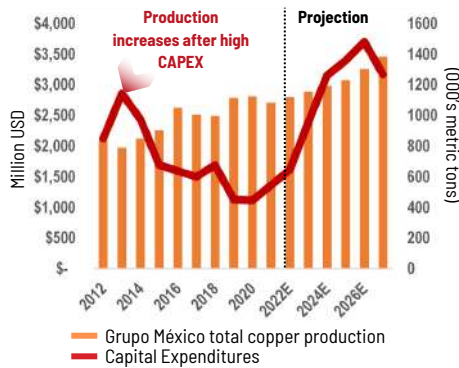


**Expanded production will capture future demand.** Management capital allocation mainly focuses on capital expenditures and dividends, depending on the outlook for copper demand and metals prices. In periods of high copper prices, industry CAPEX usually rises, as seen in the aftermaths of recessions such as 2008 or 2020, as companies look to take advantage of higher prices. Industry CAPEX is expected to rise slightly in the next two years, indicating minor expansion plans for most of the industry (Appendix 11). On the other hand, Grupo México will invest 15 billion in the next five years, expanding mine production through its program. Some of Grupo México's board-approved projects, such as El Pilar and Tía María, located in Peru, are expected to add 156 k production tons to mining operations. We expect the company's investments to pay off and increase production in the long term, since management has been able to expand production in the past, as seen in the last expansive CAPEX program from 2011 to 2015 (Figure 27). Nonetheless, management in the past has not fulfilled CAPEX programs completely, even if investments indeed increased; we expect CAPEX forecast to be below management's projections.

**Figure 26. Grupo México reserves vs peers**



**Figure 27. Grupo México CAPEX & Production forecast**



Source. Company Data, Team Analysis

**Figure 28. Solvency & Credit metrics vs. peers**

	FITCH	Altman's Zscore	Bloomberg Default Probability	Debt to Equity
Grupo México	BBB+	3.85	0.10%	49.40
Glencore PLC	BBB+	3.12	0.14%	94.11
First Quantum	B+	1.74	1.09%	80.46
Freeport McMoran	BB+	2.00	0.12%	42.44
BHP Group	A-	4.51	0.01%	38.79
Antofagasta	BBB+	3.04	0.12%	28.77

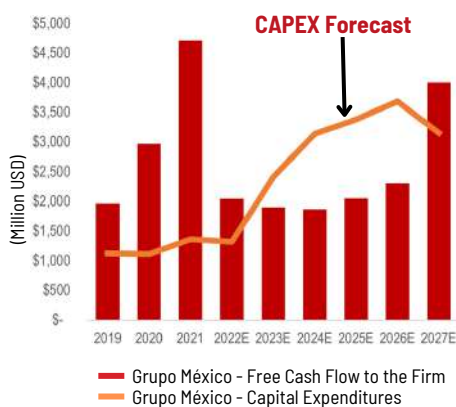
Source. Bloomberg, Capital IQ, Company Data

**Figure 29. Net debt/EBITDA vs. peers**



Source. Bloomberg, Capital IQ, Company's Data

**Figure 30. Grupo México FCFF & CAPEX Forecast**



Source. Company Data, Team Analysis

On the other hand, dividends become a priority in periods of low CAPEX plans, such as the one seen in the last five years, where the payout ratio averaged 56%. Grupo México's dividend growth is inconsistent since the company does not have a dividend policy, and dividends usually depend on copper prices and management's capital allocation priorities. As a result, we did not consider a DDM in our valuation since growth rates can be very volatile in different periods for dividends. We expect the payout ratio to decrease below the five-year average as management capital allocation priorities focus on increasing production through CAPEX. Grupo México has an approved share buyback program but has not made any significant repurchases since 2016. Given Grupo México's extensive cash balance, we believe the company has a missed opportunity to give capital back to shareholders in other ways besides common dividends.

**Acquisitions.** Grupo México recently announced a takeover proposal (OPA) of Planigrupo, a Mexican company operating on the development, construction, and administration of shopping centers in Mexico. The acquisition has been announced but is pending approval from Mexican regulation authorities. If the deal goes through, it will represent Grupo México's entrance into the commercial real estate industry, and Planigrupo will be part of the Infrastructure division. Grupo México intends to pay the full purchase price in cash, resulting in a cash outflow of MXN 4,702.4 mm, or just 1.63% of yearly sales. Due to the small size of Planigrupo's transaction for Grupo México and the purchase price per share of MXN 14.2 (less than the valuation range of comparable companies), we believe that Grupo México will purchase the Planigrupo share at fair value. In addition, we think the Planigrupo acquisition would not incorporate easily into the company's cost-segment integration since commercial real estate activities and mining operations do not complement each other. Since the acquisition is still pending, we did not include it in our FCFE forecast.

**Healthy solvency permits expansion and reduces risks.** Grupo México's internal structure gives it a competitive advantage within the industry. Although its leverage in SCC is above its closest peers, Grupo México has shown a lower D/E ratio compared to competition (Appendix 3). Over ten years, this solvency and liquidity management has allowed them to continue expanding their activities even during economic stress. Furthermore, it demonstrates management's exemplary ability to take advantage of vertical integration. This advantage is seen in how the company's credit rating does not differ from its competitors (Figure 28). Therefore, it can have a more significant business expansion supported by healthy levels of debt corresponding to the industry. In addition, its payment capacity is greater than its peers, with a historically lower ratio of net debt to EBITDA. We expect this ability to maintain this low ratio to continue, given solid solvency management. Therefore, we believe it will be below the historical average change it has maintained relative to peers (Figure 29).

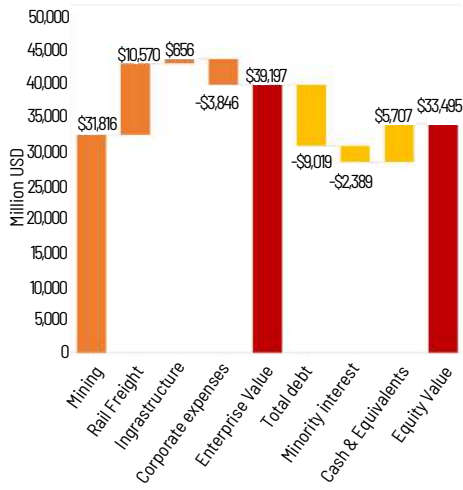
Moreover, Grupo México has shown a liquidity surplus over the years, having an average current ratio of 3.3x, which offers an insufficient use of existing assets, which could be negatively affecting the company's results. This conservative attitude of the company could persist in the future and should be considered for future projections. Another critical point to consider is that its cash cycle is higher than that of its competitors, mainly due to an increase in the expected payment time of its customers and suppliers. Nonetheless, the cash surplus can help the company withstand times of economic stress and copper volatility compared to the competition, which is relevant considering world economies face the possibility of a recession. Given current short-term risks, a great liquidity position stands out against competitors (Appendix 3).

## VALUATION

We conclude a **BUY** recommendation for Grupo México with a 12-month target price of 88 MXN, presenting a 24% upside from its 11/03/2022 closing price (Figure 1, Appendix 16). Our recommendation is primarily weighted on a Free Cash Flow to the Firm (FCFF) Discounted Cash Flow model (Appendix 16). Our DCF Model is based on a Sum of the Parts valuation (SOTP), as Grupo México's segments operate distinctly separately. Moreover, we believe a DCF model can better reflect macroeconomic conditions directly affecting copper prices and Grupo México's vertical integration-related cost advantages. In addition, we conducted a sensitivity and scenario analysis on our DCF model to assess the impact of the variability of copper prices and other investment risks (Appendix 17); furthermore, we ran a Monte Carlo simulation to capture potential scenarios better. To confirm our DCF results, we also valued Grupo México via relative valuation and a real options model. Our overall valuation confirms our investment thesis on Grupo México.

**Discounted Cash Flow.** We valued Grupo México using a Sum of the Parts DCF model (Figure 31, Appendix 16). Each operating segment was forecasted to represent each industry's growth trends, cost structures, and risks; moreover, we valued independent corporate expenses separately. The valuation was done in U.S. dollars since 92% of the company's sales are denominated in that currency. We decided to forecast metals production and reserves depletion in each operating copper mine within the mining segment, estimating their respective production rates and production life. In addition, we considered extraction probabilities for reserves, resources, and inferred minerals (Appendix 5). We consolidated the mining segment metrics starting from cost of goods sold. Our main forecast period covers 2023-2027, reflecting our view on the company's performance and copper industry drivers. Beginning in 2028, we used different growth inputs to reflect normalized growth for the company. In the Rail Freight and Infrastructure segments, we also considered the industry's drivers, such as infrastructure investment in Mexico and U.S.-Mexico trade relations trends. Our forecast shows FCFF is expected to be lower in the next few years due to higher CAPEX and lower copper prices (Figure 30). Nevertheless, we expect FCF to recover in the long term as copper industry catalysts drive demand and investments made increase mining productivity (Appendix 16). Our SOTP DCF reflects the corporate integration of Grupo México, increasing copper demand, and the company's economic moats, which we expect to drive long-term free cash flow growth.

**Figure 31. SOTP DCF Waterfall**



Source. Team Analysis, Bloomberg

**Figure 32. WACC composition**

Input	Mining	Rail Freight	Source
Risk free rate	4.00%	4.00%	U.S. 10 y government bond
Equity risk premium (US)	6.0%	6.0%	Damodaran
Unlevered beta	0.92	0.64	Industry average Damodaran
Market D/E	20%	22%	Subsidiary D/E
Tax rate	37%	30%	Marginal tax rate
Levered beta	1.04	0.74	Levered with D/E and tax rate
Country risk premium (MX)	2.2%	2.2%	Damodaran
Cost of debt (after tax)	3.65%	5.80%	Weighted average of bond yields
<b>WACC (USD)</b>	<b>11.0%</b>	<b>9.3%</b>	

Source. Team Analysis, Damodaran

**Figure 33. Monte Carlo simulation distribution**



Source. Team Analysis

**Figure 35. Monte Carlo simulation statistics**

Monte Carlo SOTP DCF	
Iterations	100,000
Median	MXN 84
25th Percentile	MXN 97
75th Percentile	MXN 68
% of Buys	56%
% of Holds	18%
% of Sells	26%

Source. Team Analysis

**WACC.** We estimated WACCs separately for Mining, Rail Freight, and Infrastructure (Figure 32, Appendix 16). Our discount rates estimates were made in U.S. dollars to match our forecasted free cash flow currency. The costs of debt were calculated as the weighted average of yields from outstanding bonds. Since both Southern Copper and GMEXICO Transportes list separately, we used bond information from the subsidiaries, except for the infrastructure segment and ASARCO, in which we assumed the same costs of debt of Grupo México and Southern Copper, respectively (Appendix 16). The costs of equity were estimated using the Capital Asset Pricing Model (CAPM). We computed re-levered betas from the industry's average unlevered betas and adjusted them with segment capital structures. Given global rising interest rates and more risk perceived in the market, we decided to use the latest ERP data from Aswath Damodaran. Our discount rates reflect the primary currency used in operations and financing. We also think they reflect current market conditions via the risk premiums, which is relevant given the company's reliance on macroeconomic factors.

**Terminal Growth.** Our terminal growth estimates were computed for each segment (Appendix 16). In the mining segment, we estimated different growth rates after our main forecast period. From years 10-30, we used an average growth rate of 3% to reflect more prolonged mining operations since Grupo México's mines are expected to last more decades. However, given the uncertainty about distant estimates for reserves depletion and new projects, we used a terminal growth rate of -2% in year 30, assuming mining operations will decline over time as natural reserves eventually diminish. In the Rail Freight segment, we computed a weighted average of long-term GDP growth rates for the U.S. and Mexico, weighted with revenue geographical composition. The same estimate for Mexico's GDP growth was used in the Infrastructure segment.

**Sensitivity Analysis.** We conducted a sensitivity analysis to assess the impact of Grupo México's operations' key value drivers and to robust our DCF model. As stated in our investment thesis, the main value drivers are copper prices and cost margins, both substantially affect our DCF value. Therefore, copper prices and their growth are the inputs that most impact value. We assessed the possibility of lower copper prices in a scenario of slower economic growth. Our calculations show an 11% decrease in our value if LME copper prices decrease 10% more than expected next year; therefore, we think it is a significant risk for the company. On the other hand, COGS margins also affect risk and value. As stated before, cost management is essential in the mining industry; a 10% increase/decrease in COGS margins increases/decreases our DCF value by 13%. In addition, Mining WACC also has an important weight on value, which could be an important risk if the company faces higher costs of capital due to potential ESG risk and a changing market view of the company. This possible effect on value can be seen in our DCF value sensitivity graph (Appendix 17). Our sensitivity analysis confirms our expected value drivers and potential risks for Grupo México.

**Scenario Analysis.** We also considered three discrete scenarios in our valuation: Bullish, Bearish, and Neutral, each representing potential opportunities, threats, and risks, also mentioned in our Investment risks section (Figure 34). In addition, we varied essential inputs such as copper prices and costs, including potential risks from higher taxes or operational risks. In the bullish scenario, our target price represents a 46% upside from the current price, and in the bearish scenario, our target price falls to MXN 58, providing a -28% downside. Our assumptions for each scenario are presented below.

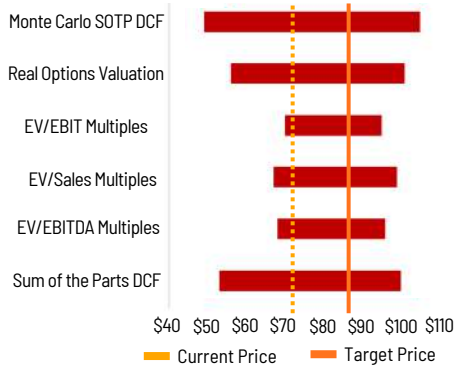
**Figure 34. Scenario Analysis**

Key driver	Bear case	Base case	Bullish case
<b>Vertical cost integration</b>	Grupo México's segments integration weakens	Grupo México keeps efficient cost management	Grupo México's cost management strengthens
Average COGS Margin		56.00%	45.00% 36.00%
<b>Copper industry catalysts</b>	Worldwide recession and lower long-term copper demand	Slow economic growth and increasing long-term copper demand	Higher economic growth and copper demand outpaces vastly supply
Average copper price growth		2.50%	3.40% 4.30%
<b>Geographical dominance</b>	Grupo México's local control diminishes	Grupo México's keeps regional advantage	Geographic position strengthens
Average production rate		4.00%	6.00% 8.00%
<b>Investment risks materialized</b>	Low ore grades (OR4), Mining taxation (PR1), ESG lag (MR5), Higher interest rates and inflation (MR2 & MR3)	Base case	
GMEXICOB Target price	MXN 51	MXN 88	MXN 104
Change from Current price	-28%	24%	46%

Source. Team Analysis

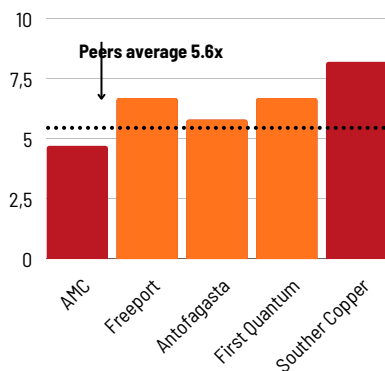
**Monte Carlo Simulation.** We conducted a 100,000-iteration Monte Carlo simulation on our SOTP DCF model, modifying the key value drivers of our investment thesis. The simulation captures continuous scenarios and presents a broader outlook on potential operating performance for Grupo México. Our simulation's summary is shown in Figures 33 and 35, incorporating the probability distribution and the summary statistics of the iterations. Additionally, the chosen variables and assumptions are shown in Appendix 19, being the most relevant copper prices growth and COGS margins. We also considered other variables, such as WACCs and probabilities for reserves extraction. Our simulation results confirm our bullish outlook, indicating a 41% probability that the DCF value exceeds our estimated target price.

**Figure 36. Valuation Football field**



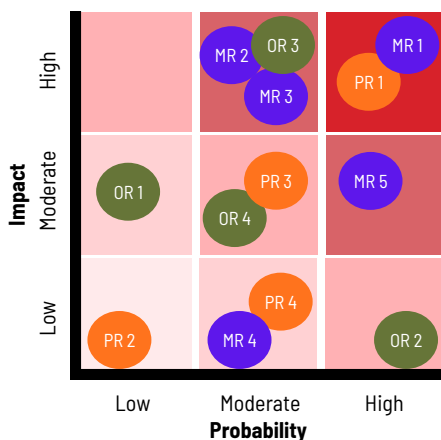
Source. Team analysis

**Figure 37. AMC mining estimated EV/EBITDA vs. Peers.**



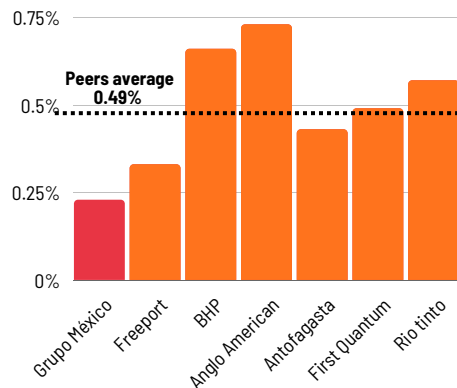
Source. Capital IQ, Team analysis

**Figure 39. Risk Matrix**



Source. Team Analysis

**Figure 40. Grupo Mexico's ore grade vs. Peers (%)**



Source. Bloomberg Intelligence

**Real Option Models.** Another methodology we used to determine the value of Grupo México's stock was the real options valuation approach. This strategy considers the company's equity to be a call option over its assets, with the face value of the debt serving as the option's strike price. We think using this methodology is relevant, given the company's stock price relation with copper prices and, thus, its volatility. To value the company's assets, we used the Black & Scholes option valuation model (Appendix 18). The asset's value was our EV estimate in our SOTP DCF valuation, and the used volatility was 12.6%, representing the variance in firm value and its correlation with worldwide copper prices. Our calculations show the stock has a value of MXN 80.4, implying copper volatility can significantly influence the company's equity value and stock price.

**Relative Valuation.** Finally, we also decided to analyze multiples and relative valuation models to support our recommendation. We decided to choose peers in each of the company's three operating segments. In the mining division, we identified companies with similar production, reserves, and market size (Appendix 15); on the other hand, we selected transport and infrastructure peers using similar metrics such as size and geographical reach. We decided to use only EV multiples due to our SOTP FCF-focused valuation and the absence of market cap values for some of the company's subsidiaries that do not trade in public markets. We chose EV/EBITDA multiples as the most representative for our calculations because of the high capital requirements of the mining and rail freight industries. We also used EV/Reserves multiples in the mining segment to analyze market pricing on industry-specific metrics. Consequently, we found that AMC is trading at a discount to the peer's average, as seen in estimating AMC's implied EV/EBITDA multiple, which shows that the corporate-cost diversification impact on the conglomerate is being overlooked, as AMC trades at a lower EV/EBITDA than its subsidiary SCC. Our relative valuation shows the company is trading at a discount compared to the mining peers' multiple averages (Figure 38). This reflects an underestimation of Grupo México's competitive advantages via cost integration and its unique geographical dominance.

**Figure 38. Relative Valuation summary**

Peer group	Number of peers	Fwd EV/EBITDA		Fwd EV/Sales		Fwd EV/EBIT	
		Median	Average	Median	Average	Median	Average
Mining	5	5.8	5.6	2.6	2.6	8.8	7.7
Rail Freight	5	10.2	11.0	5.1	5.3	12.7	13.5
Infrastructure	3	9.9	10.1	6.1	5.6	12.8	12.7
<b>GMEXICOB Fwd 2023 Multiples</b>			<b>4.7</b>		<b>2.4</b>		<b>6.0</b>
<b>Implied target price</b>			<b>MXN 91</b>		<b>MXN 95</b>		<b>MXN 99</b>

Source. Capital IQ, Team analysis

**Investment Risks**

We identify three main investment risks for Grupo México: lower ore grades due to old operating mines, governments pursuing more robust fiscal policies for taxing mining firms, and tied company performance to volatile copper prices due to cyclical macroeconomic factors.

**Operational risks**

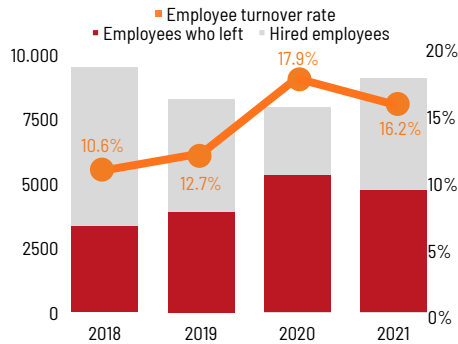
**OR1: Green bonds and trustworthiness** (LOW probability, MODERATE impact). Since Grupo México stated in past reports that they would start Fenicias Wind Park operations in 2022, and they have not yet started operating this park (as they are waiting for the permission of the Energy Regulatory Commission), the company's trustworthiness may be at risk. Furthermore, having clean energies could result in Grupo México having access to Green Bonds; however, they would need to prove efficient and reliable in their capital expenditure programs. The company could face higher costs of capital if its reputation worsens. **Mitigation:** The company already has an operating wind park (El Retiro) which signifies the company's commitment to clean energies. **Valuation Impact:** A 5% increase in our mining WACC lowers our valuation by 6%.

**OR2: Aging workforce and lack of young talent** (HIGH probability, LOW impact). Labor in the mining and transport sectors is becoming less appealing to younger generations worldwide. Currently, the workforce's composition is concentrated on older generations (e.g., the average miners' age in Mexico is 43.9). Furthermore, the decrease in the labor supply in future years will also result in higher wages and operational costs for the firm. **Mitigation:** The company keeps track of employee turnover rates for each division, categorized by race, sex, and age (Figure 41), and employs a relatively young workforce (Figure 42). **Valuation Impact:** Adjusting the revenue growth rates in mining and rail freight segments (5% lower) decreases our target price by 2%.

**OR3: Lower ore grades** (MODERATE probability, HIGH impact). Since the corporate's mines have been operating for over 50 years, ore grades have been degraded (Figure 40). Thus, the company faces the risk of having lower ore grades in the future (which are currently low compared to the competition). **Mitigation:** Grupo México uses grinding and flotation processes to increase mineral ore grades. **Valuation Impact:** Lowering the ore grade by 10% directly impacts copper reserves and revenues, decreasing our valuation by 11%.

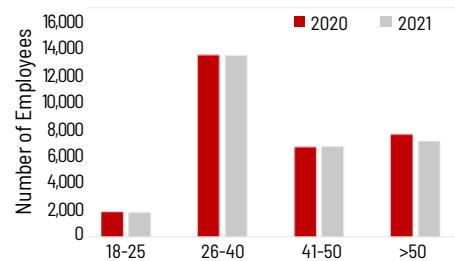
**OR4: Insufficient ESG practices** (MODERATE probability, MODERATE impact). Referring back to the Cananea incident in 2006, where the five-month strikes accounted for a 26.3% reduction in the production of copper (compared to the previous year), the company ignored the protester's claims, which translated into a second accident in 2014 regarding river pollution. Therefore, production can be affected due to possible health and safety accidents. **Mitigation:** As mentioned in *Financial Analysis*, the company's CAPEX program has paid off. Moreover, the company built a dam to prevent water pollution at Cananea. **Valuation Impact:** 10% lower production rates due to strikes and the suspension of mining activities decrease our valuation by 6%.

**Figure 41. Employee turnover rates & changes in personnel**



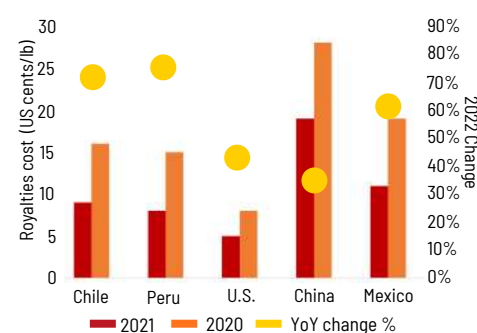
Source: Company Data

**Figure 42. Grupo México's employees by age composition**



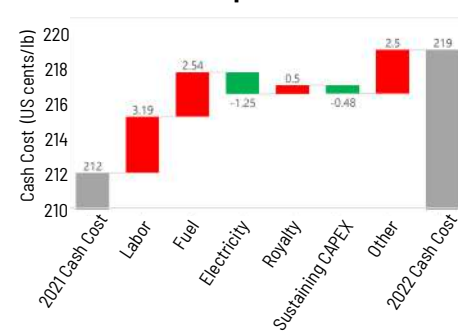
Source: Company Data

**Figure 43. Mining Royalties' increase in selected countries**



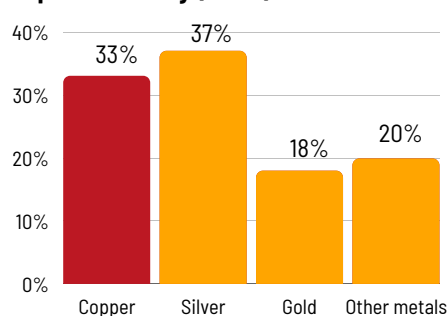
Source: S&P Global Market Intelligence

**Figure 44. Industry Cash costs increasement decomposition 2021-2022**



Source: S&P Global Market Intelligence

**Figure 45. Copper & other metals - Implied Volatility (CVOL)**



Source: Chicago Mercantile Exchange

## Political Risks

**PR1: Mining Taxation** (HIGH probability, HIGH impact). Several taxing bills in Latin American governments have been proposed to fund social programs. For example, in December 2021, the Peruvian government wanted to increase mining taxes by 3 to 4 percentage points. In addition, in July 2022, the Chilean government introduced a tax reform bill that increased copper mining royalties (Figure 43). Furthermore, in the same month, the Mexican state declared a state-owned company as the exclusive lithium producer in the country. **Mitigation:** The company complies with its royalty payments and exploits its concessions. **Valuation Impact:** A 4 percentage point increase in the mining tax rate reduces our price target by 8%.

**PR2: Antitrust laws** (LOW probability, LOW impact). The Federal Commission of Economic Competition (COFECE) has taken various approaches to increase competition in the Mexican rail freight industry by imposing taxes and reducing the number of operating years for the renewal of rail concessions. Thus, the cost of operating this sector could increase with antitrust legislation and increased competition. **Mitigation:** Grupo México holds significant contracts with the Mexican government, as mentioned in Business Description. **Valuation Impact:** a 15% increase in the rail freight segment's tax rate reduces our target price by 2%.

**PR3: Labor strikes** (MODERATE probability, MODERATE impact). Unions of mining workers continuously demand new collective contract talks for better wages and an overhaul and improvement of safety standards (71% of Grupo Mexico's workers were members of a union in 2021). Moreover, as the cost of a company operating overseas can be substantial (especially if the country lacks infrastructure or a regulatory framework), it can depress wages paid to locals and drive up the salary paid to expatriates. **Mitigation:** According to company filings, SCC's priority for future mining projects (like Tia María) is hiring local workers. Moreover, the corporation is insured for infrastructural damage or delayed production from labor disputes. **Valuation Impact:** 15% lower production rates due to strikes in mining operations decrease our valuation by 8%.

**PR4: USA Political Ambiance** (MODERATE probability, LOW impact). Since the U.S. is Mexico's top trading partner, changes in U.S. economic policies significantly affect the Mexican economy and Grupo México (e.g., during Trump's administration, the U.S. imposed new tariffs on Mexico that diminished Mexican exports). Therefore, the possibility of Trump running for president again in 2024 could affect the taxes imposed on Mexican exports, consequently impacting Grupo México's rail freight division. **Mitigation:** Grupo México's revenues are diversified in other geographical regions (Figure 6). **Valuation Impact:** 10% higher tax rates in the Rail Freight segment (representing tariffs) lowers our valuation by 1.6%.

## Market Risks

**MR1: Copper price volatility** (HIGH probability, HIGH impact). Copper is one of the most volatile metals, having an implied volatility of 33%, according to CMX (Figure 45). Its volatility is due to the metal's exposure to macroeconomic expectations and commodity market speculators. An uncertain macroeconomic landscape could affect copper prices in 2023. As a result, copper prices could significantly impact the company's share price and operating performance. **Mitigation:** As mentioned in the *Investment Summary* section, the company focuses on cost competition and vertical integration to remain profitable. **Valuation Impact:** A 15% decrease in 2023 expected copper prices lowers our target price by 17%.

**MR2: Inflation** (MODERATE probability, HIGH impact). Mining companies recently had lower margins as fuel prices have increased due to high inflation and disruptions from the war between Russia and Ukraine. Inflation has also increased labor costs through local currency depreciations (Figure 44). Inflation could persist for longer (deep in 2023) if central banks find it difficult to reduce it due to supply disruptions. **Mitigation:** Although Grupo México's energy costs accounted for 31% of total costs in 2021, Grupo México's subsidiary *GM Controladora de Combustibles* also stores and sells fuel to Grupo México and other firms, such as Valero (an oil-producer firm). **Valuation Impact:** A 7% higher COGS due to sticky inflation decreases our valuation by 10%.

**MR3: Interest rates** (MODERATE probability, HIGH impact). Interest rate hikes threaten to slow consumption and affect risk assets. Interest rates in the U.S. are expected to remain elevated or decrease slightly in 2023, but could keep rising if inflation remains high. **Mitigation:** 95% of Grupo México's debt has fixed interest rates. **Valuation Impact:** A 1.5 percentage point increase in the risk-free rate would decrease our target price to the current price.

**MR4: Transisthmian Corridor** (MODERATE probability, LOW impact). Mexico's army and national defense institutions (SEDENA and SEMAR) will operate a new railway: the Transisthmian Corridor. Its purpose will be to transport commodities and people through four Mexican states (Appendix 2). **Mitigation:** Grupo México was recently involved in constructing the Maya Train, and has passage rights through this railway. That said, the company may be allowed to operate this new railway. **Valuation Impact:** 7% lower revenue growth rates in rail freight lowers our target price by 4%.

**MR5: Lagged copper production** (HIGH probability, MODERATE impact). Copper mining systematically faces delayed production due to mining feasibility studies, government concessions and permits, and mining site construction times. However, as more investors and communities require more adherence to ESG principles, new mines are further being delayed. Consequently, this can limit Grupo México's ability to capture growing demand and compete for market share. **Mitigation:** As mentioned in the ESG section, the company has engaged in clean energy projects (such as wind parks) and plans to reduce its fleet carbon emissions. **Valuation Impact:** 15% lower expected CAPEX and 5% lower production rates lowers our valuation by 7%.

## APPENDIX MAP

- |   |                                   |                                      |
|---|-----------------------------------|--------------------------------------|
| 1. Grupo Mexico's Mining Assets                     | 7. Corporate Structure            | 14. Consolidated Cash Flow Statement |
| 2. Mexican Railway Map & Grupo México's Concessions | 8. Porter's 5 Forces              | 15. Relative Valuation               |
| 3. Competitors Comparison                           | 9. PESTEL Analysis                | 16. Sum of the Parts DCF Valuation   |
| 4. Economic Projections                             | 10. Value Chain Analysis          | 17. Sensitivity Analysis             |
| 5. Reserves & Production                            | 11. Copper Industry Insights      | 18. Real Options Valuation           |
| 6. Board of Directors Overview                      | 12. Consolidated Balance Sheet    | 19. Monte Carlo Simulation           |
|   | 13. Consolidated Income Statement |                                      |

### 1. GRUPO MÉXICO'S MINING ASSETS



#### 9 Buenavista del Cobre (SCC)

Formerly Cananea, Buenavista del Cobre is a mining complex which has one of the top 5 biggest copper mines in the world. In addition, it has the oldest operating mine in North America (it started operating in 1899).

#### 11 La Caridad (SCC)

It is a mining-metallurgical complex located in Nacozari, Sonora. As Ferromex owns a rail concession in this exact same place, its operations are vertically integrated for transporting finished copper cathodes. Furthermore, this place owns a pipeline to support its mining operations.

#### F Cuajone (SCC)

Operating under a single concession, Cuajone is the 20th largest copper mine in the world. Furthermore, although Grupo Mexico's transport division does not operate in Peru, this mine is connected to a metallurgical complex called Ilo (H) via rail tracks. Additionally, in Ilo, SCC also operates a port where it ships finished goods and imports supplies.

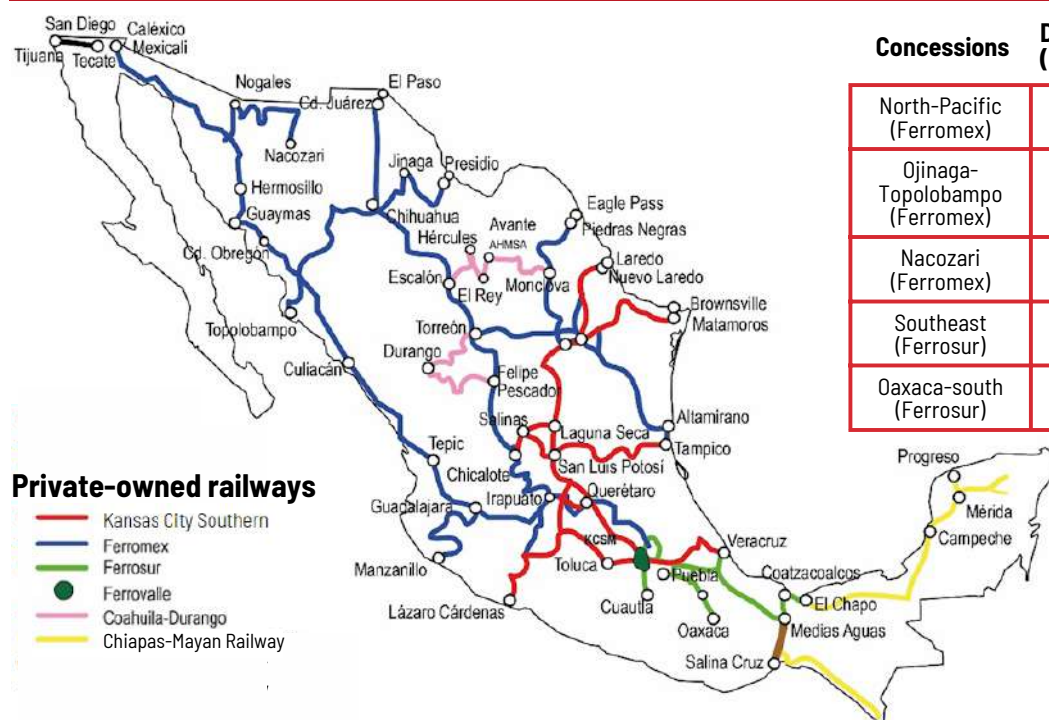
#### G Toquepala (SCC)

Toquepala is a mining-metallurgical complex connected via rail tracks to Ilo and Cuajone. It is powered by Peruvian company *Electroperú* and is managed under a single concession.



Source. Company Data, Bloomberg

### 2. MEXICAN RAILWAY MAP & GRUPO MEXICO'S CONCESSIONS



Concessions	Duration (Years)	Start of Concession	Exclusivity Period (Years)	End of Concession
North-Pacific (Ferromex)	55.5	1997	35.5	2061
Ojinaga-Topolobampo (Ferromex)	50	1997	30	2056
Nacozari (Ferromex)	30	1999	-	2029
Southeast (FerroSur)	50	1998	30	2048
Oaxaca-south (FerroSur)	30	2006	30	2036

As the Mexican Rail Freight industry lacks competition, the government allows concessionaires to operate in other concessionaires rails through "rights-of-passage", regardless of exclusivity clauses. These rights can substitute tariffs (established between concessionaires) if the government considers it appropriate.

Source. Company Data, OECD, Team Analysis

### 3. COMPETITORS COMPARISON

NI margin %	FY2011	FY2012	FY2013	FY2014	FY2015	FY2017	FY2016	FY2018	FY2019	FY2020	FY2021	10yrs average
<b>Net margin</b>												
Grupo México	23.23	25.03	19.58	19.37	12.43	12.91	16.02	12.39	20.74	20.90	26.76	19.03
Freeport	21.84	16.89	12.71	(6.54)	(83.77)	(28.01)	11.08	13.97	(1.66)	4.22	18.85	(1.86)
BHP	32.95	21.95	20.64	24.13	4.23	(22.01)	16.39	8.59	18.64	20.32	19.74	15.05
GLENCORE	2.18	0.47	(3.46)	1.04	(3.37)	0.90	2.81	1.55	(0.19)	(1.34)	2.44	0.28
FIRST QUANTUM	20.47	60.09	12.91	23.57	(19.75)	(1.68)	(9.55)	11.12	(1.40)	(3.55)	11.54	9.43
ANTOFAGASTA	20.35	15.39	11.05	8.94	18.86	4.36	15.80	11.49	10.10	9.87	17.27	13.04
<b>Sector average</b>	<b>20.17</b>	<b>23.30</b>	<b>12.24</b>	<b>11.75</b>	<b>(11.89)</b>	<b>(5.59)</b>	<b>8.76</b>	<b>9.85</b>	<b>7.70</b>	<b>8.40</b>	<b>16.10</b>	<b>9.16</b>
<b>Net Debt Ebitda</b>												
Grupo México	0.05	0.26	0.57	0.89	1.48	1.37	1.10	1.19	1.18	0.78	0.28	0.83
Freeport	NM	NM	2.22	2.16	5.18	3.10	1.48	1.07	3.37	1.60	0.16	2.26
BHP	0.16	0.76	1.07	0.91	1.25	2.53	0.96	0.55	0.46	0.84	0.19	0.88
GLENCORE	6.04	7.87	6.19	4.60	5.60	4.25	2.68	2.36	3.39	4.28	1.88	4.47
FIRST QUANTUM	NM	0.10	2.30	3.95	7.03	5.38	5.75	4.33	5.55	4.05	2.08	4.05
ANTOFAGASTA	NM	NM	NM	0.00	1.20	0.72	0.19	0.29	0.25	0.03	NM	2.50
<b>Sector average</b>	<b>2.08</b>	<b>2.25</b>	<b>2.47</b>	<b>2.08</b>	<b>3.62</b>	<b>2.89</b>	<b>2.03</b>	<b>1.63</b>	<b>2.37</b>	<b>1.93</b>	<b>0.92</b>	<b>2.50</b>
<b>ROE</b>												
Grupo México	35.22	32.64	20.43	18.51	11.05	11.16	14.43	12.04	18.05	16.50	25.97	19.63
Freeport	34.71	19.97	14.56	(4.16)	(67.61)	(34.73)	19.74	19.93	(1.09)	4.79	25.74	2.90
BHP	44.72	26.62	19.85	18.62	5.63	(0.46)	10.90	12.55	16.93	16.59	25.38	17.94
GLENCORE	15.57	3.46	(18.29)	4.69	(18.03)	(2.79)	11.07	5.52	(3.56)	(10.72)	12.20	(0.08)
FIRST QUANTUM	17.92	37.20	7.08	10.36	(5.94)	2.37	(2.34)	4.87	(0.48)	(2.17)	10.12	7.18
ANTOFAGASTA	27.78	20.94	14.20	9.74	1.07	2.07	13.57	8.92	8.95	9.10	21.17	9.51
<b>Sector average</b>	<b>29.32</b>	<b>23.47</b>	<b>9.64</b>	<b>9.63</b>	<b>(12.30)</b>	<b>(3.73)</b>	<b>11.23</b>	<b>10.64</b>	<b>6.47</b>	<b>5.68</b>	<b>20.10</b>	<b>9.51</b>
<b>Total Asset Turnover</b>												
Grupo México	0.68	0.57	0.47	0.45	0.38	0.36	0.40	0.39	0.38	0.37	0.47	0.45
Freeport	0.68	0.53	0.42	0.33	0.28	0.35	0.44	0.47	0.35	0.34	0.51	0.43
BHP	0.75	0.61	0.41	0.39	0.33	0.24	0.31	0.38	0.42	0.38	0.53	0.43
GLENCORE	2.24	2.24	1.79	1.44	1.05	1.21	1.58	1.67	1.70	1.18	1.66	1.61
FIRST QUANTUM	0.50	0.46	0.31	0.21	0.14	0.14	0.16	0.18	0.17	0.21	0.29	0.25
ANTOFAGASTA	0.52	0.55	0.47	0.41	0.25	0.27	0.34	0.33	0.35	0.33	0.44	0.63
<b>Sector average</b>	<b>0.90</b>	<b>0.83</b>	<b>0.64</b>	<b>0.54</b>	<b>0.40</b>	<b>0.43</b>	<b>0.54</b>	<b>0.57</b>	<b>0.56</b>	<b>0.47</b>	<b>0.65</b>	<b>0.63</b>
<b>D/E</b>												
Grupo México	42.76	53.98	49.48	49.72	66.00	60.90	61.75	58.82	63.86	56.30	49.40	55.72
Freeport	19.06	16.55	79.80	81.16	158.68	173.13	117.11	62.27	57.74	53.24	42.44	78.29
BHP	27.63	42.62	45.04	40.83	45.98	63.57	50.73	46.18	49.76	54.87	38.79	46.00
GLENCORE	87.09	111.71	105.17	103.25	106.88	75.97	68.72	77.26	94.48	109.47	94.11	94.01
FIRST QUANTUM	2.20	7.21	45.26	59.30	58.91	62.62	76.98	81.28	94.61	96.82	80.46	60.51
ANTOFAGASTA	27.41	21.46	15.86	29.57	32.34	36.67	29.63	26.42	29.33	37.25	28.77	66.91
<b>Sector average</b>	<b>34.36</b>	<b>42.25</b>	<b>56.77</b>	<b>60.64</b>	<b>78.13</b>	<b>78.81</b>	<b>67.49</b>	<b>58.71</b>	<b>64.96</b>	<b>67.99</b>	<b>55.66</b>	<b>66.91</b>
<b>Current ratio</b>												
Grupo México	3.71	4.60	3.72	2.81	3.63	3.69	2.80	3.15	3.29	3.75	3.40	3.51
Freeport	3.42	3.08	2.09	1.75	1.73	2.45	2.16	3.14	2.47	2.72	2.52	2.50
BHP	1.28	0.93	0.94	1.23	1.27	1.44	1.85	2.51	1.89	1.45	1.63	1.49
GLENCORE	1.45	1.15	1.28	1.21	1.03	1.00	1.12	1.10	1.06	1.10	1.17	1.15
FIRST QUANTUM	2.21	4.13	1.41	3.53	1.56	1.38	1.54	1.99	1.25	1.28	2.34	2.06
ANTOFAGASTA	4.75	4.37	3.65	3.16	2.05	2.21	2.35	2.57	2.33	3.28	3.43	2.14
<b>Sector average</b>	<b>2.80</b>	<b>3.04</b>	<b>2.18</b>	<b>2.28</b>	<b>1.88</b>	<b>2.03</b>	<b>1.97</b>	<b>2.41</b>	<b>2.05</b>	<b>2.26</b>	<b>2.41</b>	<b>2.14</b>
<b>Cash Cycle</b>												
Grupo México	54.05	55.93	53.10	59.56	64.89	69.29	67.96	62.69	66.39	64.37	53.56	61.07
Freeport	110.97	118.40	115.91	121.87	90.93	86.38	116.38	107.49	99.90	107.47	93.05	106.25
BHP	40.07	(8.33)	(75.21)	(16.48)	(150.27)	(141.52)	(69.32)	(84.67)	(90.90)	(69.92)	(14.14)	(61.88)
GLENCORE	30.95	29.13	26.11	24.76	22.40	12.49	26.89	38.93	35.75	54.04	44.86	31.48
FIRST QUANTUM	108.87	129.71	115.66	110.66	137.98	113.46	97.18	96.60	103.00	93.44	72.07	107.15
ANTOFAGASTA	66.47	58.62	48.99	44.91	55.82	57.61	43.88	48.34	50.09	58.49	45.03	48.81
<b>Sector average</b>	<b>68.56</b>	<b>63.91</b>	<b>47.43</b>	<b>57.55</b>	<b>36.96</b>	<b>32.95</b>	<b>47.16</b>	<b>44.90</b>	<b>44.04</b>	<b>51.31</b>	<b>49.07</b>	<b>48.81</b>

Source. Bloomberg, Capital IQ, Company Data, Team Analysis

### 4. ECONOMIC PROJECTIONS

Country's economic projections	2021	2022	2023	2024
<b>Real GDP growth</b>				
Mexico	4.8%	2.0%	1.5%	2.0%
USA	5.7%	1.9%	1.0%	1.7%
Eurozone	5.3%	3.0%	0.9%	1.9%
China	8.1%	3.6%	4.9%	5.0%
<b>CPI Inflation YoY</b>				
Mexico	5.7%	8.0%	5.6%	3.9%
USA	3.9%	8.1%	3.7%	2.5%
Eurozone	2.6%	7.6%	4.9%	2.3%
China	0.9%	2.2%	2.6%	2.2%
<b>Unemployment rate</b>				
Mexico	4.1%	3.4%	3.8%	3.5%
USA	5.4%	3.7%	4.5%	4.6%
Eurozone	6.9%	6.4%	6.7%	7.0%
China	4.0%	4.2%	4.1%	4.0%
<b>Interest rates</b>				
Mexico	5.4%	10.5%	10.0%	7.2%
USA	0.3%	4.3%	4.3%	3.0%
Eurozone	0.0%	2.5%	2.8%	2.5%
China	2.8%	2.8%	2.9%	2.8%

Source. World Bank, OECD, IMF, Analysts' consensus, Team Analysis (Sources average)

**Revenue Build-up assumptions.** For the construction of our revenue growth, we included the mineral reserves of each mine of Americas Mining Corporation, including Southern Copper and Asarco. A horizon period of 10 years was assumed in which each mine production rate was computed separately, depending on reserves, historical data, and future prospects. Overall we expect the mining segment to have an average annual production rate of 5% for the next decade. We estimated production for the six minerals Grupo México extracts: Copper, Molybdenum, Silver, Zinc, Gold, and Lead. This analysis gave us the mining segment's total mineral production for our forecast period. There are three types of reserves in the mining industry, depending on existence certainty; therefore, we adjusted reserves for extraction probabilities using data from Gerens, a Peruvian mining post-graduate school. Next, we used futures curves for each mineral to estimate metals prices, assuming that the market expectations are the best estimate of the future price. Then, starting from year 4 of our estimations, we used historical average nominal growth rates for the minerals and decreased in perpetual growth to long-term inflation rates. Having these inputs we forecasted mining revenues. For the Rail Freight segment, we estimated future tons transported per km based on historical figures, we also considered future US-Mexico rail freight trade prospects. For cargo prices, we used historical averages and inflation forecasts for U.S. and Mexico.

### 5. RESERVES AND PRODUCTION SUMMARY

#### Principal mines summary

Mine	Estimated copper total reserves (000's tons)	Production (000's tons)	Production rate forecast	Estimated mine life
Buenavista	11557	424		5% 20 years
La Caridad	9133	133		6% 28 years
Cuajone	7233	255		3% 20 years
Toquepala	22110	169		7% 35 years

Source. Company Data, Team Analysis

#### Extraction probabilities

Reserve category	Extraction probability
Proven & Provable Reserves	90%
Measured & Indicated Resources	60%
Inferred Resources	30%















Source. Gerens

#### Expected metals prices growth

Mineral	2023	2024	2025-2031	Long-term
Copper	-4.1%	0.3%	6.5%	2.0%
Molybdenum	3.2%	-8.8%	2.0%	2.0%
Silver	-1.3%	3.1%	3.5%	2.0%
Zinc	3.2%	-8.8%	2.0%	2.0%
Gold	5.2%	3.9%	1.5%	2.0%
Lead	1.4%	-0.4%	2.0%	2.0%

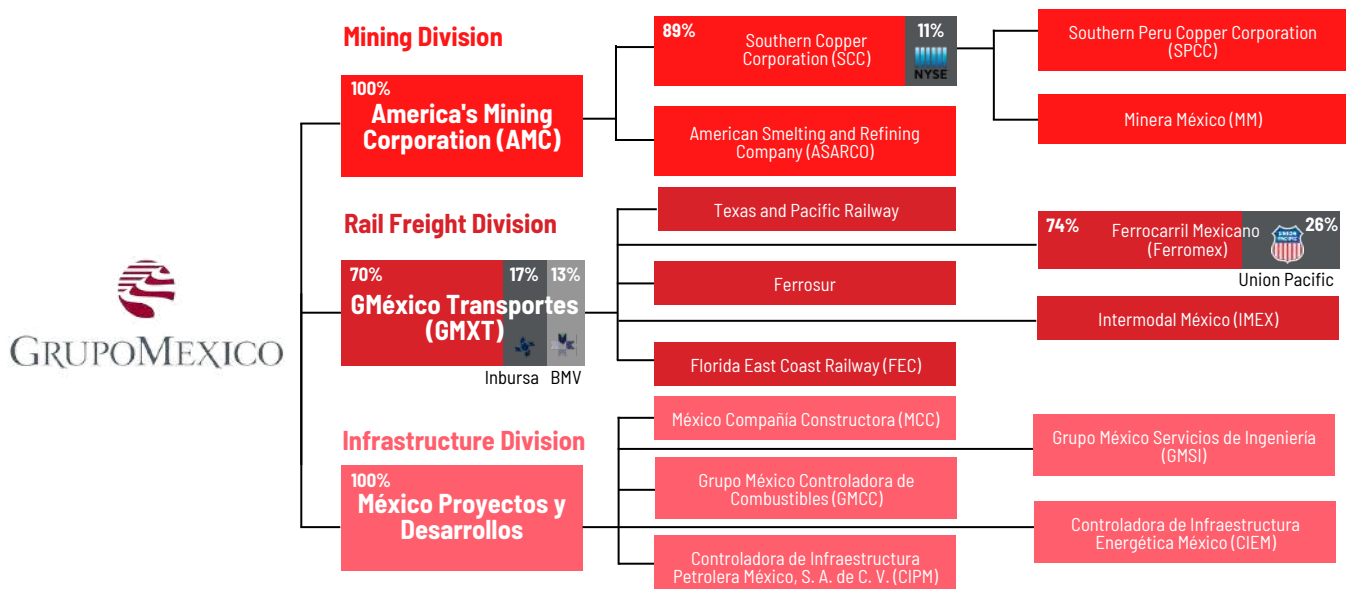
Source. CMX, LME, Team Analysis

## 6. BOARD OF DIRECTORS OVERVIEW

Name	Age	Position	Independent	Tenure (Years)	Expertise (based on the Global Industry Classification Standard)	Education	Other Corporate Governance positions
 Germán Larrea Mota Velasco	68	Chairman		41	Materials, Industrials	Business Admin. (B)	Grupo Mexico's CEO SCC Chairman
 Xavier García de Quevedo Topete	74	Deputy Chairman		39	Materials, Industrials, Financials	Chem. Eng. (B) Business Admin.	Infrastructure Division Chairman AMC Deputy Chairman
 Alfredo de Jesús Casar Pérez	67	Member		26	Materials, Industrials, Financials	Economics (B) Economics (M) Industrial Eng.	Transport Division Chairman
 Luis Castelazo Morales	65	Member		6	Materials, Industrials, Financials	Civil Eng. (B) Business Admin. (M)	Empresarios Industriales de México CEO
 Óscar González Rocha	83	Member		41	Materials, Industrials, Financials	Civil Eng. (B)	AMC, ASARCO and SCC CEO
 Fernando López Guerra Larrea	40	Member		3	Materials, Industrials	Business Admin. (B)	Transport Division CEO
 Antonio del Valle Ruiz	84	Member	✓	6	Materials, Industrials, Financials	Public Accounting (B)	Lifetime honorary chairman of Grupo Kaluz and Orbia, among others
 Emilio Carrillo Gamboa	83	Member	✓	19	Materials, Industrials, Energy, Financials, and Communication Services	Law (B)	Senior partner of the law firm Carrillo Gamboa
 Antonio Madero Bracho	85	Member	✓	21	Materials, Financials	Mining, engineering and metallurgy (B) Business Admin. (M)	Member of the Trilateral Commission
 Carlos Prieto Sierra	68	Member	✓	6	Information Technology, Financials	Business Admin. (B) Business Admin. (M)	Principal of Mexican business school Escuela Bancaria y Comercial
 Carlos Rojas Mota Velasco	68	Member	✓	6	Materials	Business Admin. (B)	Chairman and CEO of Grupo Rotoplas
 Claudio X. González Laporte	87	Member	✓	32	Financials, Consumer Staples	Chem. Eng. (B). Law (M). International Rel. (D)	Chairman of Kimberly-Clark
 Fernando Ruiz Sahagún	78	Member	✓	18	Financials	Law (B) Public Accounting (B)	Member of Fresnillo Ltd., GNP and Grupo Palacio de Hierro, among others
 Rolando Vega Saénz	73	Member	✓	12	Financials	Public Accounting (B)	Chairman and CEO of Seguros Atlas

Source. S&P Capital IQ, Company Data

## 7. CORPORATE STRUCTURE



Source. Company Data

## 8. PORTER'S 5 FORCES

### Copper Mining Division

### Rail Freight Division

**LOW**

**THREAT OF NEW ENTRANTS**

**LOW**

- **Heavy entry costs** (infrastructure, exploration and construction costs)
- **High barriers to entry** (concessions take long to be acquired and renewed, specially with tougher mining regulations from resource nationalism)

- **Heavy entry costs** (infrastructure, construction and operational costs)
- **High barriers to entry** (concessions have already been granted by the Mexican government and take a long time to be acquired and renewed)

**MODERATE**

**THREAT OF SUBSTITUTES**

**HIGH**

- **Aluminium** is cheaper than copper, but 60% less conductive
- Higher-sustained copper prices can make Aluminium more attractive
- **Silver** is another good transistor, but more expensive and scarce

- **Trucks** stands as the main substitute as it has a higher market participation (53% moved by trucks whilst 13% by rail)
- **Maritimie** and **air transport** are also strong freight substitutes

**HIGH**

**COMPETITIVE RIVALRY**

**MODERATE**

- Private and state-owned multinational companies compete for market share
- Cost-saving strategies lead companies to **scale up size and production**
- As a commodity market, firms focus on **geographies and cost competition**

- **Kansas City Southern Mexico** is the main rail freight competitor in Mexico
- **Cost and time efficient** make rail transport more competitive
- **Private and state-owned** companies in the market

**HIGH**

**SUPPLIER BARGANING POWER**

**LOW**

- The mining value chain requires **specialized processes and services**, such as smelting and metallurgical procedures
- **Switching costs** are high due to the complexity of the mining equipment

- The rail freight transport system needs gasoline in order to operate, but Grupo México can **easily change from the gasoline supplier**
- **Switching costs** are low due to homogeneous product (gasoline)

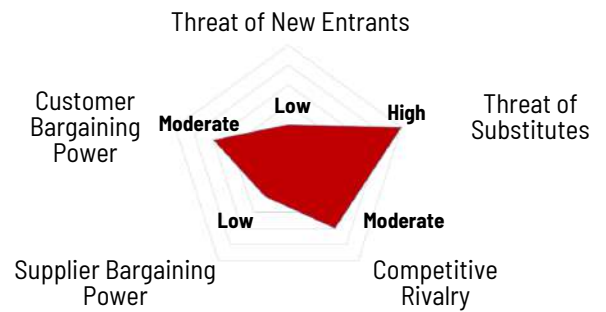
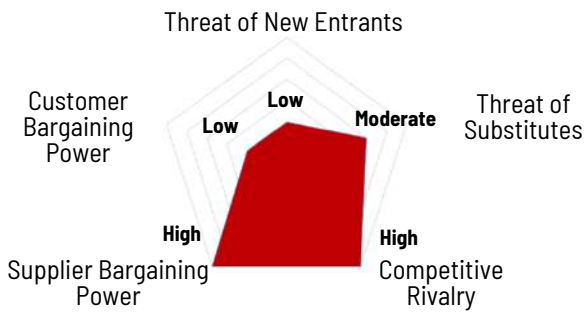
**LOW**

**CUSTOMER BARGANING POWER**

**MODERATE**

- Customers can buy from any supplier as it is a **non-differentiated product**
- Since copper has several uses, **customers are widely diversified** across several industries (such as automotive and manufacturing)

- They have a low bargaining power since it is a **non-differentiated service**
- **Grupo México** operates the majority of tracks in Mexico, therefore has higher bargaining power than their customers



Source. Team Analysis

## 9. PESTEL ANALYSIS

### Mining Division

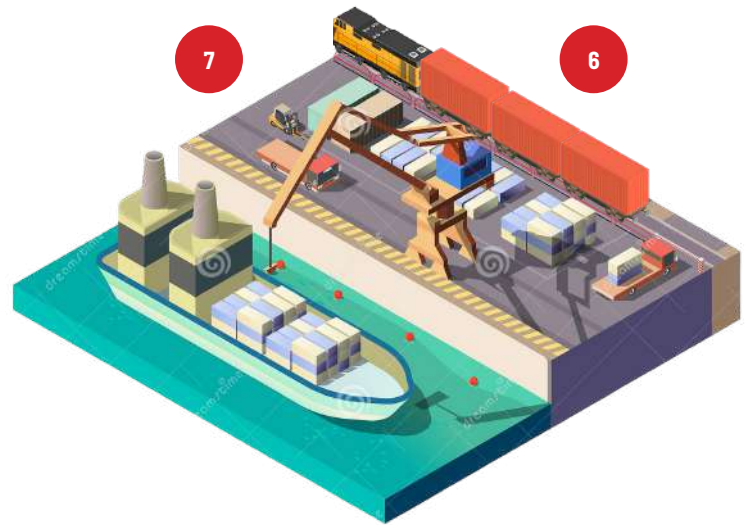
### Rail Freight Division

<b>POLITICAL</b>	<p><b>Growing geopolitical volatility.</b> Conflict between Ukraine and Russia (owner of 10% of global copper reserves).</p> <p><b>Strong environmental policy enforcement</b> (except for countries with weak regulatory frameworks).</p>	<p><b>Market structure.</b> This industry operates as a duopoly in Mexico. Private sector is given limited concessions.</p> <p>A <b>new trade agreement (USMCA)</b> was signed in 2020 between Mexico, U.S., and Canada, replacing NAFTA.</p>
<b>ECONOMICAL</b>	<p><b>Copper prices move alongside the business cycle.</b> There is more construction and manufacturing when economies are well, increasing copper demand and prices.</p> <p><b>Inflation</b> increases energy costs and pressure on wages.</p>	<p><b>Foreign trade growth</b> boosts rail freight (e.g., the automotive industry freights on trains rather than trucks).</p> <p><b>Combined investment</b> between major concessionaires improves the rail system they operate in.</p>
<b>SOCIAL</b>	<p><b>Labor strikes</b> demand better safety measures and wages.</p> <p><b>An aging workforce and lack of young talent.</b> Declining enrolment in fields like mining engineering and metallurgy.</p> <p><b>Investors requiring strict adherence to ESG principles.</b></p>	<p><b>Accidents.</b> Although the number of accidents has reduced in the last years by 21.08%, Mexico still has a higher rate of accidents than other countries.</p> <p><b>Increased vandalism</b> threatens both cargo and workers.</p>
<b>TECHNOLOGICAL</b>	<p>Following <b>patent activity trends</b>, there is a switch from refining technologies to exploration and environmental techs.</p> <p><b>Automation technologies</b> (Machine Learning and AIs) being used for productivity, safety and ecological purposes.</p>	<p><b>Continuous infrastructure maintenance and investment.</b> Currently, there are 15 rail projects in Mexico.</p> <p><b>Data analytics and big data techs</b> are being used to develop new trains and equipment, improving time efficiency.</p>
<b>ENVIROMENTAL</b>	<p><b>Pollution and hazardous waste</b> leading local communities to protest and even disrupt local firms' mining operations.</p> <p><b>Increased dislocated wildlife and habitat destruction in more biodiverse areas</b> following mineral demand growth.</p>	<p><b>Rail freight is the most fuel-efficient means of transporting goods in-ground.</b> Compared to truck freight, rail transportation saves fuel, reduces CO2 emissions, and relieves highway traffic congestion.</p>
<b>LEGAL</b>	<p><b>Growing resource nationalism.</b> Latin American governments are increasingly proposing bills to tax mining firms. In the case of Mexico, the government now holds the right to mine lithium exclusively through a state-owned firm.</p>	<p><b>Lack of effective competition.</b> To increase competition, the <b>government imposes tariffs</b> on concessionaires and gives them <b>rights of passage</b>. This trend can reduce concessions' operative time (currently 50 years) if unchanged.</p>

Source. Bloomberg, Team Analysis

## 10. VALUE CHAIN ANALYSIS

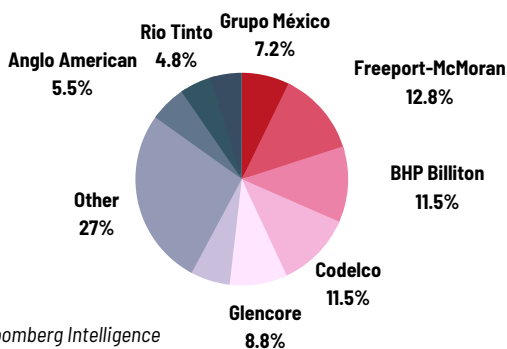
- 1 **Engineering studies.** Grupo México Servicios de Ingeniería (GMSI) subsidiary conducts feasibility studies (such as exploration projects in Mexico and Peru) for developing new mines.
- 2 **Drilling and mine construction.** Through México Compañía Constructora subsidiary (MCC), Grupo México provides maintenance to every division's infrastructure. Additionally, it constructs new mines.
- 3 **Power generation.** Supported by subsidiary México Generadora de Energía (MGE), Grupo México provides energy to its mining operations through electrical power plants and, in some places, wind parks.
- 4 **Extraction / Mining.** This task is performed by Grupo México's core subsidiaries: ASARCO and SCC. These also manage subsidiaries for each mine project respectively.
- 5 **Grinding, Smelting & Refining.** SCC's mines in Peru and México are supported by metallurgical complexes, where copper ores are grinded, smelted and refined into copper cathodes, wires or concentrates.
- 6 **Transport.** Ferromex subsidiary (the main subsidiary of the rail freight division) helps transport copper cathodes to different ports and intermodal terminals across Mexican territory.
- 7 **Intermodal.** Intermodal Mexico (IMEX) rail freight division subsidiary helps coordinate cargo transfer in order to reduce terminal dwell and make rail freight more efficient.



Source: Wood, McKinsey, Company Data, Team Analysis

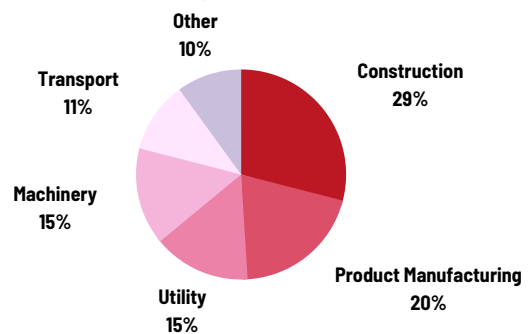
## 11. COPPER INDUSTRY INSIGHTS

### Worldwide copper production market share (2021)



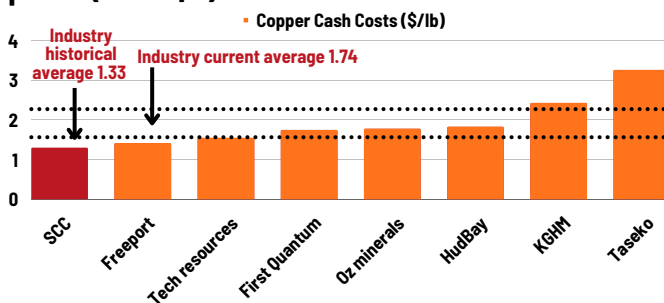
Source: Bloomberg Intelligence

### Global copper demand by end use (2021)



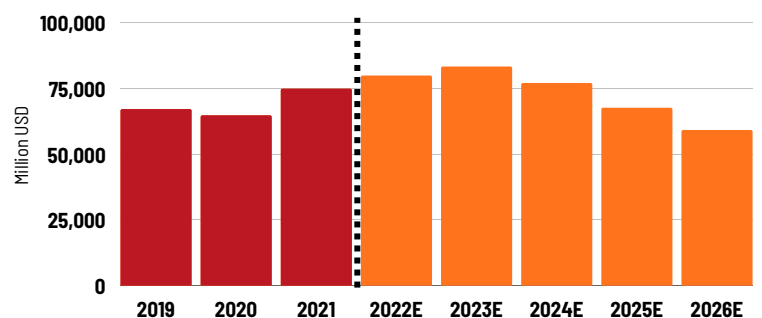
Source: CRU

### Cash Costs curve of Southern Copper vs copper peers (2022 Q2)



Source: Bloomberg Intelligence, Team Analysis

### Industry CAPEX Forecast



Source: Bloomberg Intelligence

## 12. CONSOLIDATED BALANCE SHEET

(in millions)	2019FY	2020FY	2021FY	2022E	2023E	2024E	2025E	2026E	2027E
<b>Assets (\$000)</b>									
Cash and Equivalents	2,462	3,635	5,931	6,439	6,864	6,657	6,501	6,424	6,916
<b>Cash &amp; Short Term Investments</b>	<b>3,977</b>	<b>5,190</b>	<b>6,567</b>	<b>6,757</b>	<b>7,481</b>	<b>7,275</b>	<b>7,119</b>	<b>7,041</b>	<b>7,533</b>
Accounts Receivable	1,219	1,495	1,780	1,741	1,803	1,869	1,939	2,017	2,099
Inventory	1,548	1,264	1,268	1,388	1,450	1,516	1,586	1,664	1,746
Other Current Assets	595	493	753	565	584	595	601	840	1,095
<b>Total Current Assets</b>	<b>7,340</b>	<b>8,442</b>	<b>10,369</b>	<b>10,450</b>	<b>11,319</b>	<b>11,255</b>	<b>11,245</b>	<b>11,562</b>	<b>12,473</b>
Gross Property, Plant & Equipment	28,679	29,666	30,899	32,391	34,576	37,720	41,106	44,797	47,974
Accumulated Depreciation	(11,144)	(12,108)	(13,488)	(14,978)	(16,454)	(17,979)	(19,568)	(21,287)	(23,106)
<b>Net Property, Plant &amp; Equipment</b>	<b>17,535</b>	<b>17,559</b>	<b>17,411</b>	<b>17,412</b>	<b>18,123</b>	<b>19,741</b>	<b>21,538</b>	<b>23,510</b>	<b>24,867</b>
Other Long-Term Assets	4,197	4,463	4,665	4,093	4,180	4,379	4,534	4,613	5,535
<b>Total Assets</b>	<b>29,072</b>	<b>30,464</b>	<b>32,444</b>	<b>31,955</b>	<b>33,621</b>	<b>35,374</b>	<b>37,317</b>	<b>39,685</b>	<b>42,875</b>
<b>Liabilities (\$000)</b>									
Accounts Payable	1,098	1,048	1,089	1,228	1,166	1,100	1,030	952	870
Other Current Liabilities	1,134	1,203	1,963	1,951	1,472	1,512	1,382	1,458	2,128
<b>Total Current Liabilities</b>	<b>2,233</b>	<b>2,251</b>	<b>3,053</b>	<b>3,179</b>	<b>2,638</b>	<b>2,612</b>	<b>2,412</b>	<b>2,410</b>	<b>2,998</b>
Long-Term Debt	8,785	8,603	8,277	8,175	8,600	9,146	9,796	10,521	11,284
Other Non-Current Liabilities	2,736	3,074	2,741	1,642	2,451	2,462	2,520	2,569	2,733
<b>Total Liabilities</b>	<b>13,754</b>	<b>13,928</b>	<b>14,070</b>	<b>12,996</b>	<b>13,689</b>	<b>14,221</b>	<b>14,727</b>	<b>15,500</b>	<b>17,015</b>
<b>Equity (\$000)</b>									
Common Stock	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003
Additional Paid In Capital	9	9	9	9	9	9	9	9	9
Retained Earnings	13,699	14,920	16,515	17,206	18,075	19,145	20,446	21,904	23,427
Treasury Stock	(2,769)	(2,782)	(2,791)	(2,808)	(2,825)	(2,841)	(2,856)	(2,871)	(2,887)
Comprehensive Inc. and Other	61	51	234	32	35	79	99	115	143
<b>Total Common Equity</b>	<b>13,004</b>	<b>14,202</b>	<b>15,971</b>	<b>16,442</b>	<b>17,298</b>	<b>18,395</b>	<b>19,702</b>	<b>21,161</b>	<b>22,695</b>
Total Minority Interest	2,314	2,334	2,404	2,517	2,635	2,759	2,888	3,024	3,166
<b>Total Equity</b>	<b>15,318</b>	<b>16,536</b>	<b>18,374</b>	<b>18,959</b>	<b>19,933</b>	<b>21,154</b>	<b>22,590</b>	<b>24,185</b>	<b>25,861</b>
<b>Total Liabilities And Equity</b>	<b>29,072</b>	<b>30,464</b>	<b>32,444</b>	<b>31,955</b>	<b>33,621</b>	<b>35,374</b>	<b>37,317</b>	<b>39,685</b>	<b>42,875</b>

Source: Company Data, Team Analysis

## 12. CONSOLIDATED BALANCE SHEET (COMMON SIZE)

(in millions)	2019FY	2020FY	2021FY	2022E	2023E	2024E	2025E	2026E	2027E
<b>Assets (\$000)</b>									
Cash and Equivalents	8.47%	11.93%	18.28%	20.15%	20.41%	18.82%	17.42%	16.19%	16.13%
<b>Cash &amp; Short Term Investments</b>	<b>13.68%</b>	<b>17.04%</b>	<b>20.24%</b>	<b>21.14%</b>	<b>22.25%</b>	<b>20.56%</b>	<b>19.08%</b>	<b>17.74%</b>	<b>17.57%</b>
Accounts Receivable	4.19%	4.91%	5.49%	5.45%	5.36%	5.28%	5.20%	5.08%	4.90%
Inventory	5.33%	4.15%	3.91%	4.34%	4.31%	4.28%	4.25%	4.19%	4.07%
Other Current Assets	2.05%	1.62%	2.32%	1.77%	1.74%	1.68%	1.61%	2.12%	2.55%
<b>Total Current Assets</b>	<b>25.25%</b>	<b>27.71%</b>	<b>31.96%</b>	<b>32.70%</b>	<b>33.67%</b>	<b>31.82%</b>	<b>30.13%</b>	<b>29.13%</b>	<b>29.09%</b>
Gross Property, Plant & Equipment	98.65%	97.38%	95.24%	101.36%	102.84%	106.63%	110.15%	112.88%	111.89%
Accumulated Depreciation	-38.33%	-39.74%	-41.57%	-46.87%	-48.94%	-50.82%	-52.44%	-53.64%	-53.89%
<b>Net Property, Plant &amp; Equipment</b>	<b>60.32%</b>	<b>57.64%</b>	<b>53.66%</b>	<b>54.49%</b>	<b>53.90%</b>	<b>55.81%</b>	<b>57.72%</b>	<b>59.24%</b>	<b>58.00%</b>
Other Long-Term Assets	14.44%	14.65%	14.38%	12.81%	12.43%	12.38%	12.15%	11.62%	12.91%
<b>Total Assets</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>
<b>Liabilities (\$000)</b>									
Accounts Payable	3.78%	3.44%	3.36%	3.84%	3.47%	3.11%	2.76%	2.40%	2.03%
Other Current Liabilities	3.90%	3.95%	6.05%	6.11%	4.38%	4.27%	3.70%	3.67%	4.96%
<b>Total Current Liabilities</b>	<b>7.68%</b>	<b>7.39%</b>	<b>9.41%</b>	<b>9.95%</b>	<b>7.85%</b>	<b>7.38%</b>	<b>6.46%</b>	<b>6.07%</b>	<b>6.99%</b>
Long-Term Debt	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Other Non-Current Liabilities	30.22%	28.24%	25.51%	25.58%	25.58%	25.85%	26.25%	26.51%	26.32%
<b>Total Liabilities</b>	<b>47.31%</b>	<b>45.72%</b>	<b>43.37%</b>	<b>40.67%</b>	<b>40.71%</b>	<b>40.20%</b>	<b>39.46%</b>	<b>39.06%</b>	<b>39.68%</b>
<b>Equity (\$000)</b>									
Common Stock	6.89%	6.58%	6.18%	6.27%	5.96%	5.66%	5.37%	5.05%	4.67%
Additional Paid In Capital	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.02%	0.02%	0.02%
Retained Earnings	47.12%	48.98%	50.90%	53.84%	53.76%	54.12%	54.79%	55.20%	54.64%
Treasury Stock	-9.52%	-9.13%	-8.60%	-8.79%	-8.40%	-8.03%	-7.65%	-7.23%	-6.73%
Comprehensive Inc. and Other	0.21%	0.17%	0.72%	0.10%	0.10%	0.22%	0.27%	0.29%	0.33%
<b>Total Common Equity</b>	<b>44.73%</b>	<b>46.62%</b>	<b>49.22%</b>	<b>51.45%</b>	<b>51.45%</b>	<b>52.00%</b>	<b>52.80%</b>	<b>53.32%</b>	<b>52.93%</b>
Total Minority Interest	7.96%	7.66%	7.41%	7.88%	7.84%	7.80%	7.74%	7.62%	7.38%
<b>Total Equity</b>	<b>52.69%</b>	<b>54.28%</b>	<b>56.63%</b>	<b>59.33%</b>	<b>59.29%</b>	<b>59.80%</b>	<b>60.54%</b>	<b>60.94%</b>	<b>60.32%</b>
<b>Total Liabilities And Equity</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

Source: Company Data, Team Analysis

## 13. CONSOLIDATED INCOME STATEMENT

(in millions)	2019FY	2020FY	2021FY	2022E	2023E	2024E	2025E	2026E	2027E
<b>Revenue</b>									
Mining	7,977	8,479	12,088	10,141	10,360	11,055	11,872	12,985	13,828
Transport	2,525	2,217	2,496	2,766	2,941	3,115	3,353	3,616	3,893
Infrastructure	179	213	213	220	224	233	245	252	258
<b>Total Revenue</b>	<b>10,681</b>	<b>10,909</b>	<b>14,756</b>	<b>13,127</b>	<b>13,525</b>	<b>14,403</b>	<b>15,470</b>	<b>16,853</b>	<b>17,979</b>
Cost Of Goods Sold	(4,908)	(4,618)	(4,980)	(5,853)	(6,440)	(8,486)	(8,066)	(7,728)	(8,230)
<b>Gross Profit</b>	<b>5,772</b>	<b>6,291</b>	<b>9,776</b>	<b>7,274</b>	<b>7,085</b>	<b>5,916</b>	<b>7,404</b>	<b>9,125</b>	<b>9,749</b>
Operating Exp., Total	(1,916)	(2,033)	(2,021)	(3,434)	(2,365)	(46)	(1,051)	(2,191)	(2,348)
<b>EBITDA</b>	<b>4,905</b>	<b>5,291</b>	<b>8,871</b>	<b>5,330</b>	<b>6,195</b>	<b>7,396</b>	<b>7,942</b>	<b>8,653</b>	<b>9,219</b>
Depreciation & Amort.	(1,049)	(1,033)	(1,115)	(1,490)	(1,475)	(1,525)	(1,589)	(1,719)	(1,819)
<b>EBIT</b>	<b>3,856</b>	<b>4,258</b>	<b>7,756</b>	<b>3,840</b>	<b>4,720</b>	<b>5,870</b>	<b>6,353</b>	<b>6,934</b>	<b>7,401</b>
Interest expense	(552)	(550)	(550)	(497)	(516)	(526)	(532)	(528)	(525)
Other Income (expense) net	528	396	(192)	(100)	(485)	(847)	(957)	(1,053)	(1,061)
Tax Expense	(1,164)	(1,476)	(2,482)	(1,137)	(1,071)	(1,131)	(1,129)	(1,169)	(1,249)
<b>Net Income to Company</b>	<b>2,668</b>	<b>2,627</b>	<b>4,533</b>	<b>2,106</b>	<b>2,649</b>	<b>3,367</b>	<b>3,736</b>	<b>4,183</b>	<b>4,565</b>
Minority Int. in Earnings	(454)	(347)	(579)	(379)	(477)	(606)	(672)	(753)	(822)
<b>Net Income</b>	<b>2,215</b>	<b>2,280</b>	<b>3,954</b>	<b>1,727</b>	<b>2,172</b>	<b>2,761</b>	<b>3,063</b>	<b>3,430</b>	<b>3,744</b>

Source. Company Data, Team Analysis

## 13. CONSOLIDATED INCOME STATEMENT (COMMON SIZE)

(in millions)	2019FY	2020FY	2021FY	2022E	2023E	2024E	2025E	2026E	2027E
<b>Revenue</b>									
Mining	74.68%	77.72%	81.92%	77.25%	76.60%	76.76%	76.74%	77.05%	76.91%
Transport	23.64%	20.32%	16.92%	21.07%	21.74%	21.63%	21.68%	21.45%	21.65%
Infrastructure	1.67%	1.95%	1.45%	1.67%	1.66%	1.62%	1.58%	1.50%	1.44%
<b>Total Revenue</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>
Cost Of Goods Sold	-45.96%	-42.34%	-33.75%	-44.58%	-47.61%	-58.92%	-52.14%	-45.86%	-45.78%
<b>Gross Profit</b>	<b>54.04%</b>	<b>57.66%</b>	<b>66.25%</b>	<b>55.42%</b>	<b>52.39%</b>	<b>41.08%</b>	<b>47.86%</b>	<b>54.14%</b>	<b>54.22%</b>
Operating Exp., Total	-17.94%	-18.64%	-13.69%	-26.16%	-17.49%	-0.32%	-6.79%	-13.00%	-13.06%
<b>EBITDA</b>	<b>45.93%</b>	<b>48.50%</b>	<b>60.12%</b>	<b>40.60%</b>	<b>45.80%</b>	<b>51.35%</b>	<b>51.34%</b>	<b>51.34%</b>	<b>51.28%</b>
Depreciation & Amort.	-9.82%	-9.47%	-7.56%	-11.35%	-10.91%	-10.59%	-10.27%	-10.20%	-10.12%
<b>EBIT</b>	<b>36.11%</b>	<b>39.03%</b>	<b>52.56%</b>	<b>29.25%</b>	<b>34.90%</b>	<b>40.76%</b>	<b>41.07%</b>	<b>41.14%</b>	<b>41.16%</b>
Interest expense	-5.17%	-5.04%	-3.73%	-3.78%	-3.81%	-3.65%	-3.44%	-3.13%	-2.92%
Other Income (expense) net	4.95%	3.63%	-1.30%	-0.76%	-3.58%	-5.88%	-6.18%	-6.25%	-5.90%
Tax Expense	-10.90%	-13.53%	-16.82%	-8.66%	-7.92%	-7.85%	-7.30%	-6.94%	-6.95%
<b>Net Income to Company</b>	<b>24.98%</b>	<b>24.08%</b>	<b>30.72%</b>	<b>16.04%</b>	<b>19.58%</b>	<b>23.38%</b>	<b>24.15%</b>	<b>24.82%</b>	<b>25.39%</b>
Minority Int. in Earnings	-4.25%	-3.18%	-3.92%	-2.89%	-3.53%	-4.21%	-4.35%	-4.47%	-4.57%
<b>Net Income</b>	<b>20.73%</b>	<b>20.90%</b>	<b>26.79%</b>	<b>13.16%</b>	<b>16.06%</b>	<b>19.17%</b>	<b>19.80%</b>	<b>20.35%</b>	<b>20.82%</b>

Source. Company Data, Team Analysis

## 14. CONSOLIDATED CASH FLOW STATEMENT

(in millions)	2019FY	2020FY	2021 FY	2022E	2023E	2024E	2025E	2026E	2027E
<b>Operating Activities (\$000)</b>									
Net Income - CF	2,215	2,280	3,954	1,727	2,172	2,761	3,063	3,430	3,744
Depreciation & Amort., Total	1,049	1,033	1,044	1,490	1,475	1,525	1,589	1,719	1,819
Other Operating Activities	23	1,051	1,581	933	1,064	1,062	1,053	1,046	1,043
<b>Cash from Ops.</b>	<b>3,286</b>	<b>4,365</b>	<b>6,374</b>	<b>4,150</b>	<b>4,712</b>	<b>5,348</b>	<b>5,705</b>	<b>6,196</b>	<b>6,606</b>
<b>Investing Activity (\$000)</b>									
Capital Expenditure	(1,126)	(1,115)	(1,362)	(1,491)	(2,186)	(3,144)	(3,386)	(3,692)	(3,176)
Other Investing Activities	237	285	615	242	242	242	242	242	242
<b>Cash from Investing</b>	<b>(889)</b>	<b>(830)</b>	<b>(739)</b>	<b>(1,249)</b>	<b>(1,943)</b>	<b>(2,901)</b>	<b>(3,143)</b>	<b>(3,449)</b>	<b>(2,934)</b>
<b>Financing Activity (\$000)</b>									
Total Debt Issued and repaid	817	(462)	(239)	(231)	(231)	(231)	(231)	(231)	(231)
Total Dividends Paid	(1,283)	(1,059)	(2,359)	(1,036)	(1,303)	(1,690)	(1,763)	(1,972)	(2,221)
Other Financing Activities	(920)	(841)	(1,064)	(927)	(690)	(690)	(718)	(737)	(773)
<b>Cash from Financing</b>	<b>(1,386)</b>	<b>(2,362)</b>	<b>(3,671)</b>	<b>(2,194)</b>	<b>(2,224)</b>	<b>(2,611)</b>	<b>(2,712)</b>	<b>(2,940)</b>	<b>(3,225)</b>
<b>Other Cash Flow (\$000)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Foreign Exchange Rate Adj.	64	(16)	329	(200)	(119)	(42)	(6)	116	45
<b>Net Change in Cash</b>	<b>1,075</b>	<b>1,158</b>	<b>2,293</b>	<b>507</b>	<b>425</b>	<b>(206)</b>	<b>(156)</b>	<b>(77)</b>	<b>492</b>

Source. Company Data, Team Analysis

## 15. RELATIVE VALUATION

In order to correctly apply the relative valuation method, we decided to segment the multiples used into the three main company business lines: Mining, Rail Freight, and Infrastructure. The comparable set of companies shown in the tables below was grouped according to their industry of operation and the fact that they share similar business and risk characteristics with Grupo México's subsidiaries. Given the absence of information for equity multiples on some of Grupo's México subsidiaries, we decided only to analyze firm (EV) multiples.

**Mining.** Companies with a worldwide presence were chosen to form a part of this peer set. The comparables must have a global presence considering Americas Mining Corporation is a firm with activities in numerous nations. We think that the size of mining corporations is crucial since their global reach reduces the company's risk. Peers were chosen looking at similar geographical sales and sizable copper production.

**Transport.** Publicly traded businesses with operations in North America were selected as Grupo México's transportation division peer set. The risk that the company internalizes is significantly influenced by the regulation that applies to the transportation industry in North America, which is why we decided to pick businesses that fall under the same regulation as Grupo México. Since Mexico-U.S.-Canada trade relations influence this peer group, we believe using only North American peers is representative of Rail Freight comparables.

**Infrastructure.** Many publicly traded companies in Mexico's infrastructure sector are comparable to the Grupo México infrastructure subsidiary. It was proposed that to compare this business line properly, only Mexican firms that were comparable in size to the Grupo México subsidiary should be included. We decided to include three of the country's most representative public infrastructure firms focused on industrial projects.

Mining segment	Market Cap (m usd)	Enterprise Value (m usd)	EV/EBIT			EV/EBITDA			EV/Sales			EV/Reserves	
			2021	2022	2023E	2021	2022	2023E	2021	2022	2023E	2021	2022
Freeport-McMoran	\$ 45,265	\$ 56,604	10.6	7.6	9.2	7.9	5.7	6.7	3.2	2.4	2.6	2.1	1.7
BHP Billiton	\$ 124,800	\$ 126,400	4.9	3.9	5.4	4.2	3.4	4.4	2.5	1.9	2.4	3.0	2.9
Rio Tinto	\$ 89,189	\$ 90,976	3.9	4.0	5.1	3.3	3.2	4.6	1.8	1.5	1.8	1.0	0.3
Antofagasta	\$ 13,072	\$ 14,615	9.4	6.5	9.8	7.0	4.8	5.8	3.8	2.6	2.9	1.6	1.4
First Quantum	\$ 12,471	\$ 19,317	14.2	7.5	8.8	6.4	5.2	6.7	3.7	2.8	3.2	1.0	0.8
Average			8.6	5.9	7.7	5.8	4.5	5.6	3.0	2.2	2.6	1.7	1.4
Median			9.4	6.5	8.8	6.4	4.8	5.8	3.2	2.4	2.6	1.6	1.4
<b>Grupo México (GMEXICOB)</b>	<b>\$ 27,946</b>	<b>\$ 33,648</b>	<b>9.3</b>	<b>5.2</b>	<b>6.0</b>	<b>7.2</b>	<b>4.6</b>	<b>4.7</b>	<b>2.7</b>	<b>2.7</b>	<b>2.4</b>	<b>0.8</b>	<b>0.5</b>

Rail Freight segment	Market Cap (m usd)	Enterprise Value (m usd)	EV/EBIT			EV/EBITDA			EV/Sales		
			2021	2022	2023E	2021	2022	2023E	2021	2022	2023E
Union Pacific	\$ 121,929	\$ 154,711	18.1	15.3	14.4	14.4	12.3	11.7	7.5	6.2	5.9
Canadian Pacific	\$ 64,170	\$ 79,846	16.7	20.0	11.2	13.9	15.8	9.3	9.6	8.4	4.8
CSX Corporation	\$ 57,685	\$ 73,638	16.3	13.0	12.7	12.6	10.5	10.2	7.0	5.2	5.1
Norfolk	\$ 50,541	\$ 64,870	21.2	13.4	12.5	12.9	10.3	10.0	7.6	5.2	4.9
Canadian National	\$ 79,330	\$ 91,427	18.9	17.2	16.9	15	13.8	13.6	8.4	7.7	5.9
Average			18.2	15.8	13.5	13.8	12.5	11.0	8.0	6.5	5.3
Median			18.1	15.3	12.7	13.9	12.3	10.2	7.6	6.2	5.1
<b>GMEXICO Transportes (GMXT)</b>	<b>\$ 8,005</b>	<b>\$ 9,580</b>	<b>12.0</b>	<b>11.5</b>	<b>10.1</b>	<b>8.8</b>	<b>8.6</b>	<b>7.3</b>	<b>3.6</b>	<b>3.6</b>	<b>3.3</b>

Infrastructure segment	Market Cap (m usd)	Enterprise Value (m usd)	EV/EBIT			EV/EBITDA			EV/Sales		
			2021	2022	2023E	2021	2022	2023E	2021	2022	2023E
PINFRA	\$ 2,767	\$ 5,225	10.0	6.75	5.8	8.66	5.82	5.46	5.29	3.91	3.63
Impulsora del Desarrollo y Empleo en América Latina	\$ 2,859	\$ 2,657	20.0	14.9	12.8	23.53	16.0	15.0	10.0	6.6	6.1
Aleatica	\$ 2,791	\$ 8,023	32.2	22.6	19.5	12.6	10.5	9.9	12.6	7.5	6.9
Average			20.7	14.8	12.7	14.9	10.8	10.1	9.3	6.0	5.6
Median			20.0	14.9	12.8	12.6	10.5	9.9	10.0	6.6	6.1

### RAIL FREIGHT MULTIPLES EV

Rail Freight segment	EV/EBIT	EV/EBITDA	EV/Sales
2023 Median multiple	12.70	10.2	5.1
2023 Metric	\$ 787	\$ 1,181	\$ 2,941
Implied EV	\$ 9,997	\$ 12,042	\$ 14,999
<b>Average</b>	<b>\$ 12,346</b>		

### SOTP MULTIPLES VALUATION

Peer group	Peers EV/EBITDA median	Implied EV (m USD)	Peers EV/EBIT median	Implied EV (m USD)	Peers EV/Sales median	Implied EV (m USD)
Mining	5.8	\$ 28,124	8.8	\$ 34,323	1.4	\$ 26,937
Rail Freight	10.2	\$ 12,042	12.8	\$ 9,997	6.1	\$ 14,999
Infrastructure	9.9	\$ 1,384	12.8	\$ 415	6.1	\$ 1,373
Implied Grupo México EV		\$ 41,550		\$ 44,735		\$ 43,309
Implied GMEXICOB target price		<b>MXN 91</b>		<b>MXN 99</b>		<b>MXN 95</b>

### MINING MULTIPLES EV

Mining segment	EV/EBIT	EV/EBITDA	EV/Sales	EV/Reserves
2023 Median multiple	8.8	5.8	2.6	1.4
2023 Metric	\$ 3,900	\$ 4,874	\$ 10,360	46,897
Implied EV	\$ 34,323	\$ 28,124	\$ 26,937	65,352
<b>Average</b>	<b>\$ 38,684</b>			

### INFRASTRUCTURE MULTIPLES EV

Infrastructure segment	EV/EBIT	EV/EBITDA	EV/Sales
2023 Median multiple	12.8	9.9	6.1
2023 Metric	\$ 33	\$ 140	\$ 224
Implied EV	\$ 415	\$ 1,384	\$ 1,373
<b>Average</b>	<b>\$ 1,057</b>		

Source: Bloomberg, Capital IQ, Team Analysis

# 16. SUM OF THE PARTS DCF VALUATION

## MINING SEGMENT

\$ Million USD	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E
Revenues	\$ 8,637	\$ 12,088	\$ 10,141	\$ 10,360	\$ 10,952	\$ 11,775	\$ 12,891	\$ 13,736	\$ 14,554	\$ 15,335	\$ 16,068	\$ 16,740	\$ 17,341
Cost of goods sold	\$ 3,646	\$ 4,137	\$ 5,882	\$ 5,419	\$ 4,969	\$ 5,235	\$ 5,615	\$ 5,860	\$ 6,596	\$ 6,947	\$ 7,274	\$ 7,572	\$ 7,837
Gross Profit	\$ 4,991	\$ 7,951	\$ 4,259	\$ 4,941	\$ 5,983	\$ 6,540	\$ 7,277	\$ 7,876	\$ 7,958	\$ 8,389	\$ 8,794	\$ 9,168	\$ 9,504
Operating expenses	\$ 1,020	\$ 1,060	\$ 1,075	\$ 1,041	\$ 1,100	\$ 1,183	\$ 1,299	\$ 1,392	\$ 1,485	\$ 1,577	\$ 1,668	\$ 1,757	\$ 1,843
EBITDA	\$ 4,865	\$ 7,826	\$ 4,137	\$ 4,874	\$ 5,912	\$ 6,464	\$ 7,189	\$ 7,775	\$ 7,841	\$ 8,254	\$ 8,637	\$ 8,984	\$ 9,291
Operating Income	\$ 3,971	\$ 6,891	\$ 3,184	\$ 3,900	\$ 4,883	\$ 5,357	\$ 5,977	\$ 6,484	\$ 6,473	\$ 6,812	\$ 7,127	\$ 7,411	\$ 7,661
NOPAT	\$ 1,696	\$ 4,114	\$ 2,006	\$ 2,457	\$ 3,076	\$ 3,375	\$ 3,766	\$ 4,065	\$ 4,078	\$ 4,292	\$ 4,490	\$ 4,669	\$ 4,827
Depreciation and Amortization	\$ 894	\$ 935	\$ 953	\$ 974	\$ 1,029	\$ 1,107	\$ 1,212	\$ 1,291	\$ 1,368	\$ 1,442	\$ 1,510	\$ 1,574	\$ 1,630
Capital expenditures	\$ 627	\$ 934	\$ 1,144	\$ 1,953	\$ 2,732	\$ 2,988	\$ 3,272	\$ 2,720	\$ 2,620	\$ 2,415	\$ 2,169	\$ 1,883	\$ 1,561
Change in NWC	\$ 188	\$ -1,413	\$ 183	\$ 186	\$ 197	\$ 212	\$ 232	\$ 247	\$ 262	\$ 276	\$ 289	\$ 301	\$ 312
Free Cash Flow to the Firm	\$ 1,774	\$ 5,528	\$ 1,633	\$ 1,292	\$ 1,177	\$ 1,281	\$ 1,474	\$ 2,409	\$ 2,565	\$ 3,042	\$ 3,542	\$ 4,058	\$ 4,584
Enterprise Value	\$ 31,816												

## RAIL FREIGHT SEGMENT

\$ Million USD	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E
Revenues	\$ 2,317	\$ 2,496	\$ 2,766	\$ 2,941	\$ 3,115	\$ 3,353	\$ 3,616	\$ 3,893
Cost of goods sold	\$ 1,207	\$ 1,303	\$ 1,604	\$ 1,647	\$ 1,713	\$ 1,844	\$ 1,989	\$ 2,141
Gross Profit	\$ 1,110	\$ 1,193	\$ 1,162	\$ 1,294	\$ 1,402	\$ 1,509	\$ 1,627	\$ 1,752
Operating expenses	\$ 456	\$ 422	\$ 538	\$ 507	\$ 494	\$ 485	\$ 516	\$ 545
EBITDA	\$ 1,004	\$ 1,108	\$ 1,055	\$ 1,181	\$ 1,281	\$ 1,380	\$ 1,488	\$ 1,602
Operating Income	\$ 655	\$ 771	\$ 624	\$ 787	\$ 908	\$ 1,024	\$ 1,111	\$ 1,207
NOPAT	\$ 476	\$ 543	\$ 437	\$ 551	\$ 635	\$ 717	\$ 777	\$ 845
Depreciation and Amortization	\$ 349	\$ 337	\$ 431	\$ 393	\$ 374	\$ 355	\$ 377	\$ 395
Capital expenditures	\$ 274	\$ 313	\$ 402	\$ 367	\$ 348	\$ 331	\$ 351	\$ 368
Change in NWC	\$ -30	\$ 26	\$ 23	\$ 24	\$ 26	\$ 28	\$ 30	\$ 32
Free Cash Flow to the Firm	\$ 580	\$ 541	\$ 443	\$ 553	\$ 635	\$ 713	\$ 773	\$ 839
Enterprise Value	\$ 10,570							

## INFRASTRUCTURE SEGMENT

\$ Million USD	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E
Revenues	\$ 251	\$ 213	\$ 220	\$ 224	\$ 233	\$ 245	\$ 252	\$ 258
EBITDA	\$ 154	\$ 154	\$ 138	\$ 140	\$ 146	\$ 153	\$ 158	\$ 162
Operating Income	\$ 20	\$ 11	\$ 32	\$ 33	\$ 34	\$ 36	\$ 37	\$ 38
NOPAT	\$ 15	\$ 8	\$ 22	\$ 23	\$ 24	\$ 25	\$ 26	\$ 26
Depreciation and Amortization	\$ 134	\$ 142	\$ 106	\$ 108	\$ 112	\$ 118	\$ 121	\$ 124
Capital expenditures	\$ 236	\$ 100	\$ 67	\$ 68	\$ 71	\$ 74	\$ 77	\$ 78
Change in NWC			\$ 9	\$ 9	\$ 10	\$ 10	\$ 10	\$ 11
Free Cash Flow to the Firm			\$ 52	\$ 53	\$ 56	\$ 58	\$ 60	\$ 62
Enterprise Value	\$ 656							

## CORPORATE EXPENSES

\$ Million USD	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E
Corporate Expenses	\$ 150	\$ 387	\$ 417	\$ 436	\$ 452	\$ 467	\$ 484	\$ 496
After-tax Corporate Expenses			\$ 292	\$ 305	\$ 316	\$ 327	\$ 339	\$ 362
Corporate Discount	\$ 3,846							

**Terminal growth.** We used two different terminal growth rates in the mining segment. A growth rate in cash flows of 3% was assumed until year 30 of the projection, and then a perpetuity decrease rate of -2% was assumed. In this way, we reflect the wear and tear of the mining industry. Minerals, finite resources, will eventually come to an end; however, it is uncertain when it will ultimately happen. We assumed that in the future, the cash flows for Grupo México would not stop but would come from some other activity that is assumed to have a risk similar to mining; as a result, we used the same WACC to discount the decreasing perpetual flows. In the Rail Freight segment, we assumed a terminal growth rate of 2.38%, computed with a weighted average of expected GDP growth for the U.S. and Mexico, with geographical revenue segmentation. In infrastructure we used a terminal growth rate of 2.5%, reflecting long-term Mexico GDP growth.

**WACC.** As part of our SOTP analysis, we had to construct a WACC for each one of the business lines of the company. To build all four WACCs, we used the following process. First, our cost of equity calculations were based on the CAPM. We used the ten-year U.S. treasury bond yield as the risk-free rate. Second, our equity premium was obtained from the database from NYU professor Aswath Damodaran, for the U.S. market. Additionally for each industry we took the unlevered industry beta provided by Damodaran and levered them using each of Grupo México subsidiaries' capital structures (It is assumed that these capital structures will maintain constant into perpetuity). We assumed that Infrastructure has the same structure as the conglomerate, and that ASARCO has the same structure as Southern Copper. Finally, we added the Mexico country risk premium provided by Damodaran to account the fact that the companies trade and operate in the Mexican market, as our valuation was done in U.S. dollars.

Source: Company Data, Damodaran, Team Analysis

## WACC COMPUTATION

Weighted Average Cost of Capital	Mining	Rail Freight	Infrastructure	GMEXICOB
Cost of equity				
Risk free rate (U.S.)	4.0%	4.0%	4.0%	4.0%
Equity risk premium (U.S.)	6.0%	6.0%	6.0%	6.0%
Industry Unlevered beta	0.92	0.64	0.68	
Subsidiary D/E	20.4%	22.1%	33.5%	
Marginal tax rate	37.0%	30.0%	30.0%	30.0%
Levered beta	1.04	0.74	0.84	1.21
Country risk premium (MX)	2.2%	2.2%	2.2%	2.2%
CAPM	12.5%	10.1%	10.9%	13.9%
Cost of debt				
Weighted average bond yields (pre-tax)	5.7%	8.3%	5.8%	5.8%
Weighted average bond yields (after-tax)	3.6%	5.8%	4.1%	4.1%
WACC				
Weight of equity	83.1%	81.9%	74.9%	74.9%
Weight of debt	16.9%	18.1%	25.1%	25.1%
WACC	11.0%	9.3%	9.2%	11.9%

## SOTP DCF COMPUTATION

Sum of the Parts DCF (SOTP)	(Million USD)
Mining segment (AMC)	\$ 31,816
Rail Transport segment (GMEXICO Transportes)	\$ 10,570
Infrastructure segment	\$ 656
Corporate expenses	\$ 3,846
Enterprise Value (GMEXICOB)	\$ 39,197
Cash and Equivalents	\$ 5,707
Total Debt	\$ 9,019
Minority Interest Total	\$ 2,389
Fair Value of Equity	\$ 33,495
Shares Outstanding	7,785
Exchange rate (USD/MXN)	\$ 19.8
Discounted Cash Flow value per share	MXN 85
Current Price	MXN 71
Upside	20%

## TARGET PRICE COMPUTATION

Target Price weighting	Value	%	weight
SOTP DCF	\$ 85.2	60.0%	51.1
EV/EBITDA Multiples	\$ 91.2	15.0%	13.7
EV/Revenue Multiples	\$ 95.0	7.5%	7.1
EV/EBIT Multiples	\$ 99.3	7.5%	7.4
Real Options Valuation	\$ 80.4	5.0%	4.0
Monte Carlo DCF	\$ 84.4	5.0%	4.2
			100% MXN 88

## 17. SENSITIVITY ANALYSIS

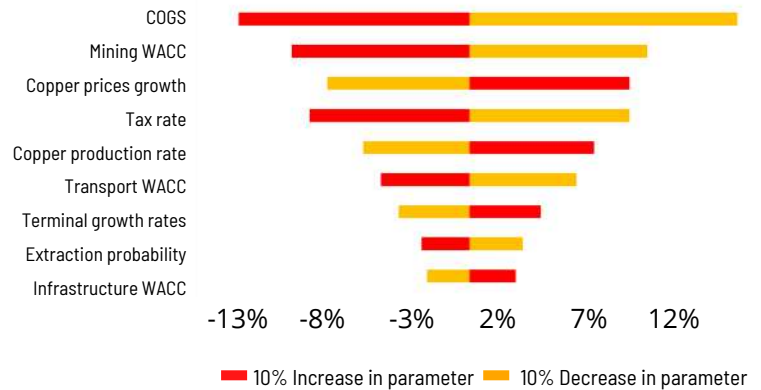
		Average copper price growth				
		2.5%	3.0%	3.5%	4.0%	4.5%
COGS Margin	36%	\$ 97	\$ 102	\$ 107	\$ 113	\$ 118
	41%	\$ 85	\$ 90	\$ 96	\$ 100	\$ 106
	46%	\$ 75	\$ 89	\$ 85	\$ 88	\$ 92
	51%	\$ 64	\$ 68	\$ 73	\$ 76	\$ 79
	56%	\$ 53	\$ 56	\$ 60	\$ 63	\$ 66

		Terminal growth rates (% change in segment rates)				
		-10.0%	-5.0%	0.0%	5.0%	10.0%
WACCs (% change in segment waccs)	-10.0%	\$ 99	\$ 101	\$ 102	\$ 103	\$ 105
	-5.0%	\$ 91	\$ 92	\$ 94	\$ 95	\$ 96
	0.0%	\$ 83	\$ 84	\$ 85	\$ 86	\$ 88
	5.0%	\$ 76	\$ 77	\$ 78	\$ 79	\$ 81
	10.0%	\$ 70	\$ 72	\$ 73	\$ 75	\$ 76

Source. Team Analysis

### SOTP DCF Value sensitivity



Source. Team Analysis

## 18. REAL OPTIONS VALUATION



Source. Team Analysis

To determine the value of Grupo Mexico's stock, we employed the real options approach. This strategy considers the company's equity to be a call option over its assets, with the face value of the debt serving as the option's strike price. Debt was assumed to be converted into a zero-coupon bond. Using the Black & Scholes model we can price the call option with the following equations:

Where:

$$S^x = S - VP(Div)$$

$$S^x = 37,037 \text{ million USD (Value of the firm pre-tax WACC)} \quad C^x = S^x N(d_1) - VP(K) N(d_2)$$

VP(Div) = 0 (Dividend present value)

$$d_1 = \frac{\ln \frac{S^x}{VP(K)} + \sigma \sqrt{T}}{\sigma \sqrt{T}}$$

VP(K) = 9,019 (Outstanding debt)

$$d_2 = d_1 - \sigma \sqrt{T}$$

T = 17 (Life of debt)

$\sigma$  = 12.6% (Variance in firm value, correlation with worldwide copper price)

$C^x$  = 31,621 million USD (Value of equity)

The model gives us a stock price of MXN 80.42

## 19. MONTE CARLO SIMULATION

Given the uncertainty of many factors affecting Grupo Mexico's stock, we decided to conduct a Monte Carlo simulation. We performed 100,000 simulations. The parameters we chose for the simulation are the following:

1. Average copper prices growth during our forecast period.
2. COGS Margins.
3. Segments WAC
4. Terminal growth rates.
5. Reserve's extraction probabilities

We used historical information to determine the parameter's mean and standard deviation. Our probability distributions for our parameters, simulation statistics, and the distribution of our simulation, are shown on the right side. Our results indicate a 41% probability of values being above our target price and a 62% probability of values being above the current price. The simulation results support our recommendation.

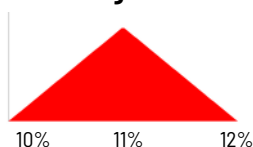
### Simulation Distribution



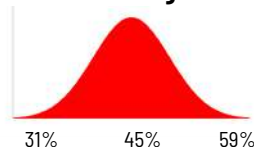
### MONTECARLO SUMMARY

Iterations	100,000
Base case SOTP DCF	MXN 85
Mean	MXN 87
Median	MXN 84
25th percentile	MXN 99
75th percentile	MXN 70
Standard Deviation	16.8
Coefficient of Variation	0.19
Skewness	0.95
Kurtosis	6.56
% Above current price	62%
% Above target price	41%

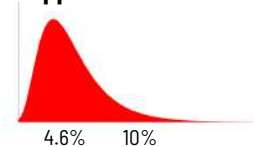
### Mining WACC



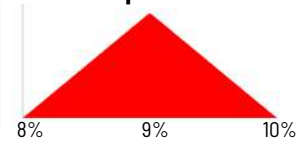
### COGS Margin



### Copper Prices Growth



### Transport WACC



Source. Team Analysis