NIOBIUM---BRAZILIAN MINING'S ACE IN THE HOLE

November 29, 2018

By **Jerry Haar and Cristina Caus**

Fed up with high crime rates, massive corruption, and a poorly performing economy, Brazilians voiced their pleasure with the status quo by electing in October as president a right-wing congressman and ex-army captain from a very small nationalist and populist political party. Guided by a liberal ideology, supporting free market policies such as privatization and deregulation, Bolsonaro's victory has been well-received by the private sectors both in Brazil and abroad.

Among the newly-elected president's top priorities will be the development of the nation's natural resources and the vigorous promotion of Brazil's exports-good news for the country's mining sector, but bad news for environmentalists and indigenous groups fearful of the continued destruction of natural resources and the displacement of tribes inhabiting the Amazon, in particular.

The importance of Brazil's mining sector to the nation's economy cannot be understated. The ninth largest country in the world, Brazil possesses huge reserves of bauxite iron ore, niobium and nickel and a leading producer of precious metals such as gold. Mineral products and mining account for 7 percent of Brazil's GDP, if one includes mineral transformation, and 15 percent of all exports. Iron ore is the most important Brazilian export, enabling the country to earn revenue of approximately over $2.5 billion. Brazil is also the largest exporter of tin, lithium, niobium, bauxite and manganese, which contribute to overall revenues of mineral exports.

The mining sectors earn a considerable amount of revenue for the state and also provide large numbers of jobs. Mineral exports represent 15 percent of all exports and 7 percent of GDP. A total of 8,870 companies compete in the mining industry in Brazil, including foreign firms from the U.K., U.S., Canada, Japan and Australia, but the main companies that dominate the country are: Vale, the fourth largest company in Brazil, which comprises almost 80% of the total mining sales. Its main minerals are iron ore, nickel, manganese, copper, coal, and cobalt; Camaro, a company which is half-owned by Vale and the other half owned by BHP Billiton. Its main minerals are iron pellets, and Namisa which also produces iron ores. It is a company owned 60 percent by CSN and 40 percent by a Japanese consortium.

The outgoing Temer government opened up previously protected areas for mining activities. The region in question covers an area bigger than Denmark of which 30 percent will open up for mining activities. The government's objective for this initiative is to attract new investment, generate wealth for the country and improve employment rates and income for Brazilian society. To further stimulate investment, the government plans to increase royalties by a set rate on various mineral resources. One may expect the Bolsonaro government to continue the policies of removing bureaucratic hurdles and improving transparency regarding mining industry. In addition, the current limit of a 40 percent stake for foreigners in mining ventures in Brazil is also expected to increase.

While iron comprises the greatest reserves, production and export of all minerals in Brazil, it is niobium, one of the least known mineral sources among the public that has emerged as a real game-changer in Brazil's mining ecosystem. And a promising one it is; for 93 percent of the world's mined production of niobium is sources from Brazil while the other 7 percent is sourced from Canada.

Niobium is a metal not commonly known in the investment world; however, it is considered critically strategic by many governments such as those in the U.S. and Europe. In actuality, there are no viable substitutes for the metal's essential use. Its growing demand is due to niobium's use in defense-related, aerospace, energy and transportation industries. This rare, strong metal is hard to find and hard to value, with anti-corrosive properties and high resistance to heat and wear. It is used extensively in gas pipelines; and since it is a perfect steel hardener, it is used in creation of super alloys in aerospace and for military applications such as missiles and jets and permits designers to reduce the weight and cost of fabrication. Consider just 2 examples. According to the World Steel Association, $9 of niobium added to a mid-sized automobile reduces its weight by 220 lbs., increasing fuel efficiency by 5 percent. The addition of 0.025 percent of niobium to the steel in the Millau Viaduct, the tallest bridge in the world, reduced the weight of the steel and concrete by 60 percent in the overall project and cut the cost of project by $25 million.

For almost 50 years now, only 3 primary niobium mines–2 in Brazil and one in Canada–have been responsible for global supply. Two principal companies mine niobium in Brazil: the Brazilian firm CBMM in Araxá, Minas Gerais State, and the Chinese company CMOC (formerly Anglo-American owned) in Catalão, Goiás State.

The price of niobium has remained stable during the last several years (approximately $45 per kilo) and does not appear to be impacted by external factors. The reserves (460 million tones) are enough to supply current world demand for about 500 years. Moreover, its demand is constantly growing each year by approximately 10 percent. Its consumption is expected to increase in the coming years as industrial development in such countries as Brazil, China, and India continues, and the rapidly increasing global population demands more consumer goods including cars, cell phones, computers, and other high-tech products. This creates a quite attractive and advantageous environment for foreign investment in niobium in Brazil.

While the Bolsonaro government will surely pursue policies and initiatives to broaden and deepen mining activities for both public and private sector companies, contrary to the interests of environmental, indigenous and human rights groups, it will nonetheless continue the crackdown

on illegal mining in the Amazon such as those installed in Jamanxim and Río Novo National Parks earlier this month. More daunting challenges for the incoming government–and for those both supportive and opposed to Bolsonaro–are the impediments that continue to stifle Brazil's growth, development, and efforts to further liberalize, modernize and humanize its society–namely bureaucracy, corruption, the tax regime, the administration of justice, and trade barriers.

The world demand and pricing for minerals such as niobium, iron ore, bauxite and manganese will ebb and flow with market conditions. These are not within the power to control by any government; addressing the impediments cited above are however. If the Bolsonaro government can do so, all sectors and industries beyond mining will surely benefit.

Jerry Haar is a business professor at Florida International University and a Global Fellow of the Woodrow Wilson International Center for Scholars in Washington, D.C. Cristina Caus is an international project management consultant.