

Bawdwin: Myanmar's first foreign mining investment?

Draft Report

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Context and Background

Formerly known as Burma, the country of Myanmar is believed to be highly rich in a variety of minerals such as copper, lead, zinc, coal and tin as well as gems like sapphire and ruby.¹ Researchers have identified at least 2917 mines of potential mines across the whole country²

Myanmar experiences a very brief democratic history and new political leadership. Since 2017, a new investment law was put in place and further reforms in 2018 have start attracting foreign investors allowing foreigners to apply to large-scale mining blocks³.

Bawdwin mine is one of the most significant foreign-backed investment projects under consideration; located in the northern part of Shan State, it holds a transformative potential for the Myanmar mining sector and -according to the concessionary- it's set to become one of the top 10 producing sites of silver and the 3rd largest-producing lead mine in the world⁴. It also has significant reserves of zinc.

Myanmar Minerals (MYL) an Australian-based company, formerly known as Top End Minerals, paid the local Win Myint Mo Industries Co. Ltd (WMM) - holders of the concessions since 2009- a \$1.5 million deposit for the option to acquire an interest in the project in 2017,⁵ and later exercised the option and acquired a 51% participating interest in the project, forming the "Bawdwin Joint Venture (BJV)" alongside two Myanmar partners WMM and East Asia Power. There are no public details on how the revenues will be divided between the partners.

The MYL Pre Feasibility Study indicates a total amount of 18.4 MT of ore as probable reserves within the Starter Pit. The first production is expected to take place at the end of 2021 or early 2022.

Bawdwin will likely transform the mineral industry in Myanmar. Projecting revenues only from an initial Starter Pit phase, by 2023 the mine could generate 40% more government revenues than the whole mining sector of 2017.

Our financial model predicts the government could earn as much as \$1.9 billion in the next 13 years assuming MYL succeeds in raising the investment needed to develop the mine.

¹<https://oxfordbusinessgroup.com/overview/seeking-assurance-efforts-attract-further-investment-centre-enhancing-resource-sharing-and>

²https://www.researchgate.net/publication/301730995_Mining_in_Myanmar_Remote_sensing_of_mining_change_between_2002_and_2015

³<https://www.mmtimes.com/news/eight-foreign-investor-apply-myanmar-mining-exploration-permits.html>

⁴Myanmarmyning.com

⁵https://assets.ctfassets.net/hnlfgsjz6je/6pxQpia5fGwUmlG6cqW6w/44219b9cf2968571ba8b1c86cead3d29/180605_MYL_Investor_Prresentation.pdf

Key Features & Assumptions

The present model is based on available public information from Myanmar Metals⁶, Australian Securities Exchange (ASX),⁷ The Extractive Industries Transparency Initiative (EITI)⁸ as well as local media publications. The model uses a discounted cash flow valuation method, using as a base scenario the latest discount rate specified by Myanmar Minerals in its 2019 pre-feasibility study: 8%⁹.

The model has been built according to the FAST financial modelling standard¹⁰ and is published under a Creative Commons license. All data and assumptions are explicit and sourced.

Project Economics

The financial model is significantly based on MYL pre-feasibility study published in May 2019, as well as MYL's own investor presentations over 2018-19. With Bawdwin being the main project currently driving MYL's own economics and raise of funding, the amount of detailed estimates available was significant.

Economic Parameters	
Life of field	2020-2034 (Starter Pit)
Production profile	Mineral ore of 18.4MT with 6.4% Pb, 5.4 Ag (oz/t) and 3.4% Zn) representing 74% of the total production from the Starter Pit
Forecast price	PFS estimated commodity prices on LME . Silver US\$/oz 17.30 payability at 95% Lead US\$/t 2,170 payability at 95% Zinc US\$/t 2,535 payability at 85%
Cost	US\$ 300 mn as development capital costs. US\$ 17 mn as sustaining capital costs. US\$ 12 mn as Starter Pit closure.
	Operating costs over the life of the Starter Pit total US\$ 2.7 billion, where 70% are assumed variable and 30% fixed.

Despite the fact BJV exploration found new discoveries and seven high priority exploration targets and although MYL continuously announces higher inferred reserves reaching 100.6Mt

⁶ <https://myanmarmetals.com.au/>

⁷ <https://www.asx.com.au/asx/share-price-research/company/MYL>

⁸ <https://eiti.org/myanmar>

⁹ [https://assets.ctfassets.net/hnlfgsjz6je/4ujERL2XYuz9zwaEt3RyVA/06918aee2901a2438887e047206d2ec5/190917_DGF_Presentation.p](https://assets.ctfassets.net/hnlfgsjz6je/4ujERL2XYuz9zwaEt3RyVA/06918aee2901a2438887e047206d2ec5/190917_DGF_Presentation.pdf)
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¹⁰ <https://www.fast-standard.org/the-fast-standard/>

by October 2019, the OpenOil model focuses on the probable ore reserves¹¹ of the Starter Pit, which also matches the scope of the model MYL has presented to potential investors.

The company is due to publish a Final Feasibility study in 2020.

Upon completion of the feasibility studies for the Bawdwin Project, the Myanmar Investment Commission (MIC) will need to approve, pursuant to a recommendation from the Ministry of Natural Resources and Environmental Conservation (MONREC)¹²

The model constructs future revenue flows using the production profile specified for the starter pit by MYL assuming a 1 year ramp-up and then an “steady state production” or plateau where latest year of production is expected to take place in 2034.

Fiscal regime

Bawdwin fiscal regime is mainly made up of royalties (which are 3% and 4%), a complex profit share mechanism, and a corporate income tax. The profit share mechanism is by far the biggest revenue stream for the government.

Our model’s base scenario includes corporate income tax with a 7-year tax holiday since MYL state to investors they will apply for such a tax holiday. Discount rate is set at 8% corresponding with MYL PFS estimates, despite previous publication by the company where a 10% was mentioned.

There is no available or detailed information of costs for environmental fund or social projects in the region. The model also assumes minor charges such as dead rent and training fees as specified in the general Myanmar Model Production Sharing Contract (PSC).

Fiscal Regime	
Royalty rate	3% assumed for lead and zinc 4% assumed for silver
Income tax rate	25% of taxable income in the years when no tax holiday period is granted
Profit share mechanism ¹³	Defined as $50\% \times (1 - (\text{Production Cost} / \text{Revenue After Mineral Tax}))$. <ul style="list-style-type: none"> • <i>Revenue After Mineral Tax</i> calculated as follows (zinc):

¹¹https://assets.ctfassets.net/hnlfgszg6je/5qqB91zwMgg0jpf6Dqugc/aa01b2ab129a1ac515412ad24f86065e/191029_September_Quarterly.pdf

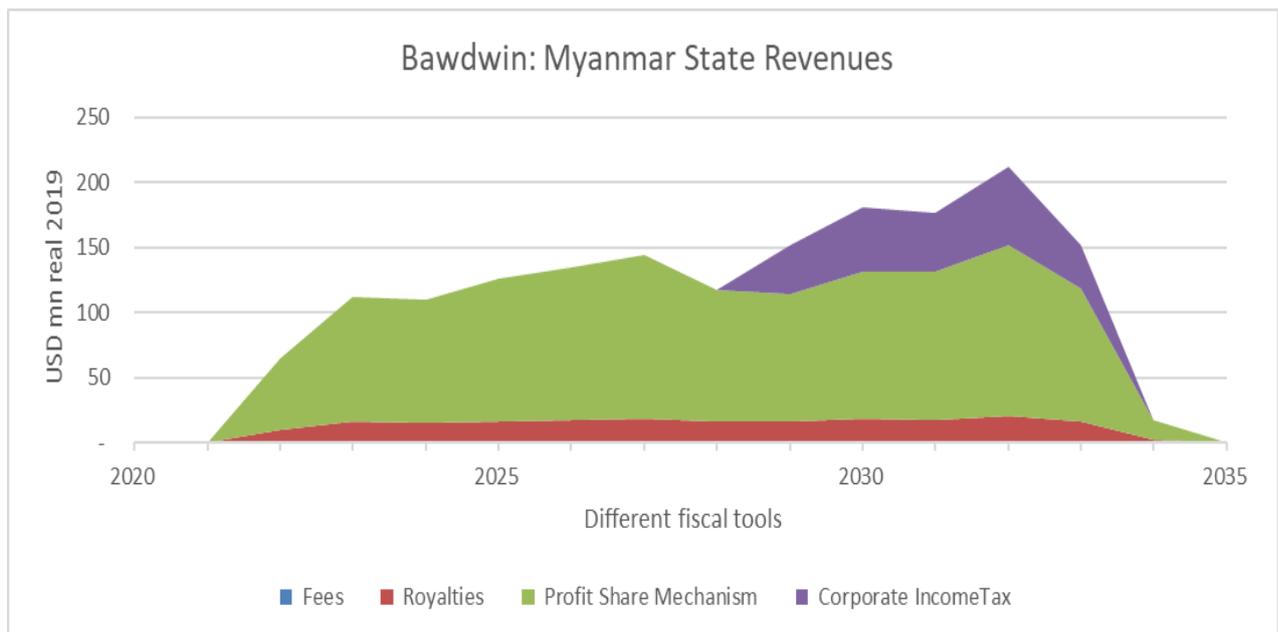
¹²<https://cloud.weblink.com.au/pdf/wcnewstemp/02107447.pdf> Page 23

¹³https://assets.ctfassets.net/hnlfgszg6je/6pxQpia5fGwUmlgG6cqW6w/44219b9cf2968571ba8b1c86cead3d29/180605_MYL_Investor_Presentation.pdf

	<p>(LME refined Zn Price x 85% recovery x % Zn grade - (Treatment Charges \$160/t + [LME refined Zn price - \$1,500/t] x 16%)) x Production of Concentrated Zinc Powder (t) - Mineral Tax.</p> <ul style="list-style-type: none"> ● <i>Revenue After Mineral Tax</i> calculated as follows (lead): (LME refined Pb Price x 90% recovery x % grade - (Treatment Charges \$160/t + [LME refined Pb price - \$1,000/t] x 16%)) x Production of Concentrated Lead Powder (t) - Mineral Tax - 4% (USD) ● <i>Revenue After Mineral Tax</i> calculated as follows (silver) (LME refined Ag Price x ([oz Ag in Pb Conc. x 31.1g/oz] - 90g) / 31.1g/) x Production of Concentrated Lead Powder (t) - Mineral Tax - 4% (USD)
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Findings

Transformative for Myanmar mining revenues



As proposed by MYL the Bawdwin project would start to provide the first sizeable revenues out of a mining project in Myanmar. Revenues from the main fiscal tools would exceed \$100 million by 2023, and peak at over \$200 million in 2032, after corporate income tax was introduced in the late 2020s. Royalties would provide a low and steady income, but be dwarfed by the profit split mechanism, which supplies the bulk of state revenues in all years of the project.

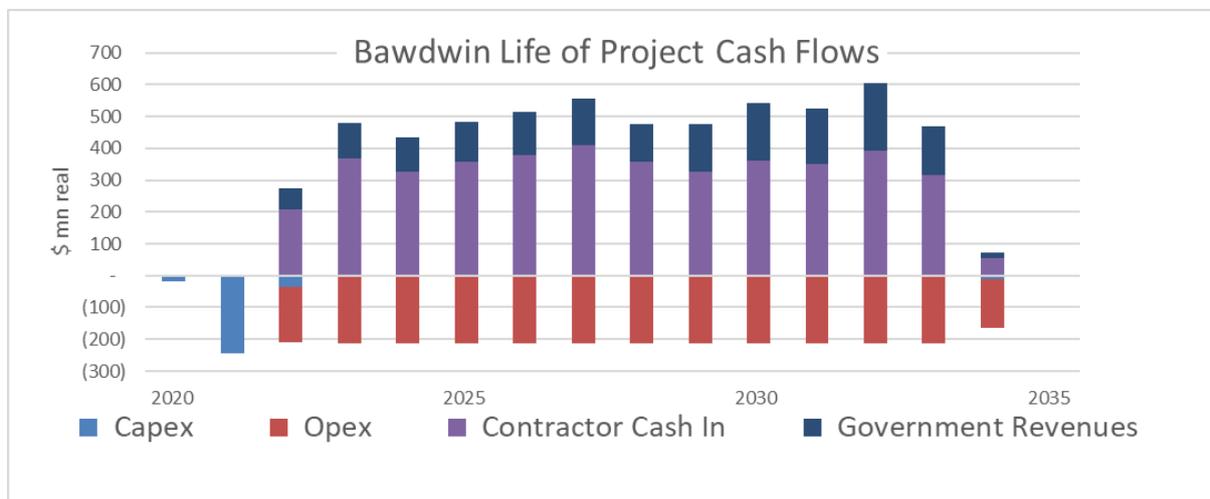
The scale for the Bawdwin project is transformative: the model predicts the government would earn \$112 million a year by 2023 even if a corporate income tax holiday was in effect - more than 40% than what the whole industry generated together in 2017 (tax and non tax revenues).

The mine would also be unique in that it is known to be the only site producing refined lead and silver, as the others only produce concentrates¹⁶ - according to the EITI report of 2017, no revenue or exportation was collected on silver during the period 2016-2017¹⁷.

Metric	Myanmar mining sector	Bawdwin 2023	Bawdwin 2032
Tax revenue	\$31 m ¹⁴		\$60m
Non-tax revenue	\$21 m ¹⁵	\$112 m	\$153 m

Profitability and Cash Flows

The model closely matches the results presented by MYL in investor presentations and the pre-feasibility study. Revenues of \$5.9 billion over the life of the Starter Pit phase result in positive cash flows of \$2.9 billion. This is then split into \$1.7 billion accruing to the state of Myanmar, and \$1.2 billion to the company. Of government revenues, some \$1.28 billion comes from the profit share mechanism, \$197 million from royalties and \$225 million from corporate income tax (imposed after the seven year holiday has lapsed).



¹⁴ Value in 2017 in million MMK 39,742

¹⁵ Value in 2017 in million MMK 27,181

¹⁶ <https://frontiermyanmar.net/en/fluctuating-fortunes-at-the-bawdwin-mine>

¹⁷ Yearbook 2018 not freely available yet

Sensitivity Analysis

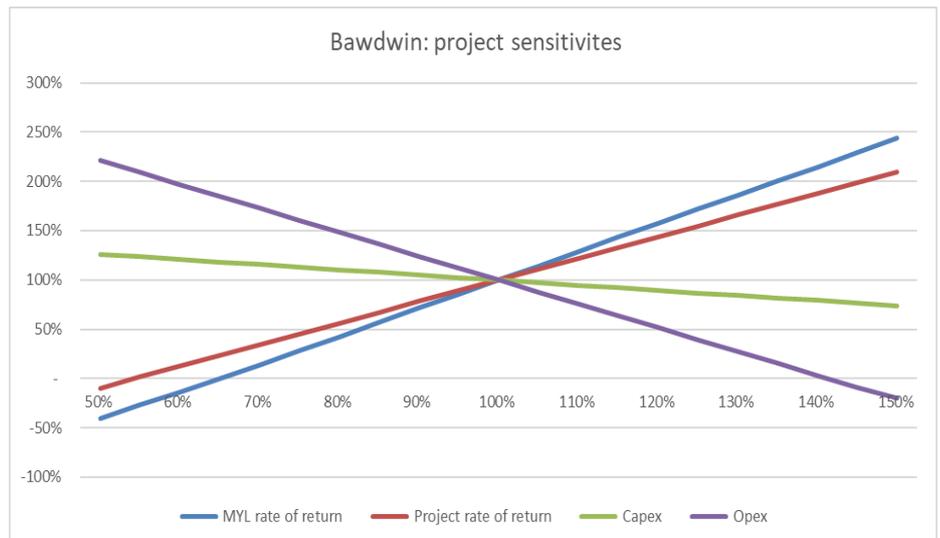
Projections included in MYL statements to investors speak of high profitability, and the company estimates capital expenditure of \$300 million is needed to launch large scale production at Bawdwin.

This shows in relatively low sensitivity to a rise in

capital expenditures, compared to operating expenditure. MYL's own investor return, as represented by Net Present Value, is highly sensitive to price fluctuations: a 50% rise in commodity prices, for example, would yield an NPV (at 8% discount) which was more than twice the NPV of the base scenario, using the company's target prices.

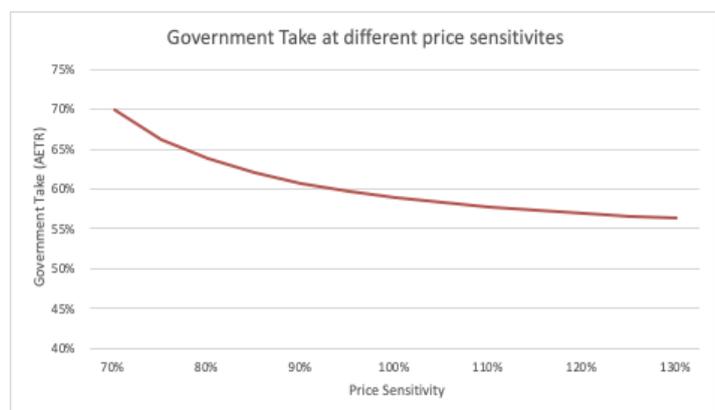
On the bear side, a persistent drop in prices by more than 35% would leave the project unprofitable. MYL's plans for export seem to be directed towards China, and the sensitivity to price may represent an investment risk in the case of "lock in" to Chinese buyers.

Another potential investment risk could be production projections. MYL assumes that a plant with a two million tonne capacity will be at virtually unbroken 100 percent capacity throughout the 13-year production period envisaged in the MYL pre-feasibility study. If production fell by 10% over the life of the project, MYL assumed revenue after tax could come down 30%.



Fiscal regime

The fiscal regime is regressive, but not drastically so. Government take (or what the International Monetary Fund defines as the Average Effective Tax Rate) is 59% in the base scenario, dropping to 57% if prices rose 20%, or rising to 64% if prices dropped 20% from target prices.

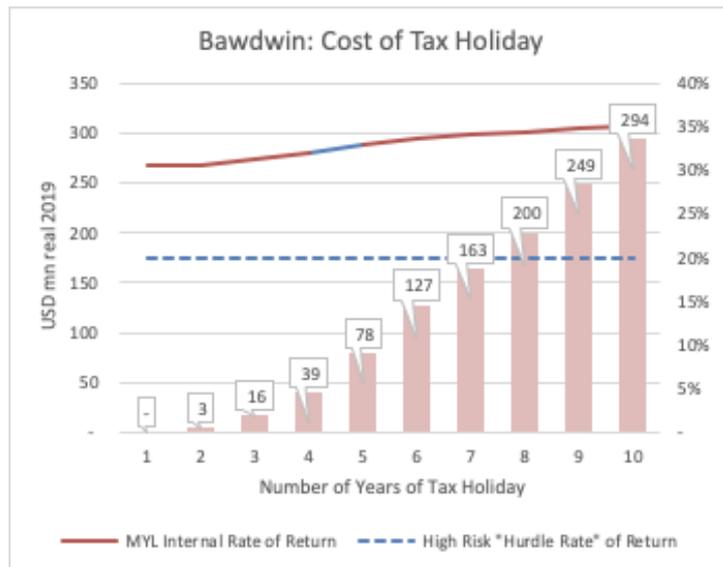


The cost of a tax holiday

The average rate of production share and royalty combined in Myanmar seem to be higher than comparison countries, as reported by Natural Resource Governance Institute¹⁸. On the

¹⁸ <https://resourcegovernance.org/analysis-tools/publications/taxing-myanmar-large-mining-companies>

other hand, MYL statements envisage a holiday on corporate income tax of seven years. The model shows that a tax holiday for such a period would cost the government of Myanmar \$163 million in foregone corporate income tax. At the same time, analysis suggests the company would achieve an Internal Rate of Return (IRR) of 31% if no tax holiday was granted – above a 20% “hurdle rate” representing some minimum rate of return required to justify the risk of a relatively untried investment environment. The chart shows income losses to the state of any duration of corporate income tax holiday.



The tax holiday decision is in the hands of the Myanmar Investment Commission (MIC).

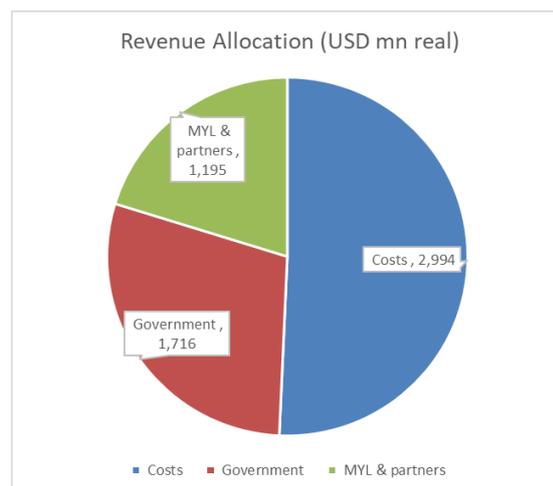
Qualitative Considerations

Above ground risk

The Shan State of Myanmar is a complex area with history of discontent and clashes between ethnic groups and military forces. This situation could prove sensitive to production stoppages.

MYL reckons there has been no impact to date to the mine project. However, according to the publication of results September 2019 by MYL themselves, currently foreigners are not even able to visit the site due to the potential risks presented by the level of activity in the region.¹⁹

In addition, as MYL relies heavily on demand from China, revenues will be dependent on factors relating to the Chinese economy.



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https://assets.ctfassets.net/hnlfgsizg6ie/4ujERL2XYuz9zwaEt3RyVA/06918aee2901a2438887e047206d2ec5/190917_DGF_Presentation.pdf

As reported by Reuters, China's industrial production grew at the weakest pace in 17 years in August 2019,²⁰ directly impacting base-metal prices.²¹

MYL background

Bawdwin was not the first attempt from MYL, formerly known as Top End Minerals (TDN), to invest in the Myanmar market. By April 2017, TDN had an option to purchase 60% of the total issued share capital Cornerstone Resources (Myanmar) Limited (CRML), a zinc producer whose major assets were Lashio Zinc Refinery (LZR) which is neighbouring to Bawdwin and it's managed and operated by East Asia Power.

However, that option was never exercised and instead, by May 2017 TDN had already decided Bawdwin was the investment they wanted to make. TDN later changed its name to Myanmar Minerals and acquired a 51% participating interest in the project, forming the "Bawdwin Joint Venture (BJV)" alongside East Asia Power -managers of Lashio Zinc Refinery- and Win Myint Mo Industries Co. Ltd (WMM) owners of the concession since 2009.

Prior the Bawdwin project the company was in a weak financial position reporting losses since 2014: Myanmar Metals, formerly known as Top End Minerals (TDN) even tried to make a switch from minerals into tech, a move that resulted in more losses.

In 2016, the company entered into a Term Sheet to acquire all of the issued share capital of the Anyvision Group, a leading Israeli facial recognition business. But they later agreed to a mutual termination agreement of the operation. MYL returned its focus to the minerals.

Currently Australian Perilya is MYL's biggest shareholder - taking a 19.9% stake, is owned by the Chinese Shenzhen Zhongjin Lingnan NonfermetCo. Limited²² with a \$3 billion market capitalisation.

²⁰ <https://www.cnbc.com/2019/09/16/reuters-america-metals-base-metals-decline-on-weak-china-demand-outlook.html>

²¹ <https://www.metalbulletin.com/Article/3898659/MORNING-VIEW-LME-base-metals-prices-mixed-after-US-China-trade-talks-make-progress-but-no-deal.html>

²² <http://www.perilya.com.au/about-us>

Recommendations

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