

Bulyanhulu gold Mine, Tanzania: financial analysis

Introduction

Bulyanhulu is a large underground gold mine in northern Tanzania, which has been in production since 2001. By the end of 2014 it had produced and sold around [3.8](#) million ounces of gold, with a further 9.2 million ounces of relatively certain [Reserves](#) plus 7.8 million ounces of less certain [Resources](#) remaining to be produced. Acacia Mining Plc (Acacia) quotes a remaining mine life of [34 years](#). The average grade is around 8 to 9 grammes per tonne, which is relatively high, but it is an underground mine costs are also high.

Bulyanhulu was one of several large gold mines that were developed in Tanzania after a major policy reform initiated in 1997 which successfully attracted large-scale foreign investment into Tanzania's mining sector. However, to achieve this generous tax and other incentives were granted that have since proven controversial. Bulyanhulu has thus far not paid any income tax, despite record gold prices during its first decade of production, and as our analysis shows it is unlikely to do so for several more years. By the end of this decade government revenues should increase significantly, although that also depends to a large extent on future gold prices.

Public opinion in Tanzania generally holds that the fiscal concessions under the 1997 reforms were overly generous and have deprived the state of much needed revenues. Tanzania significantly reformed its regulatory and fiscal regime for mining in 2004, eliminating some of the key concessions, but Bulyanhulu and other major Tanzanian gold projects continue to apply the original fiscal terms stabilized under their Mining Development Agreements (MDAs).

We do not seek to second guess the appropriateness of the 1997 policy but rather, using publicly available information, to develop an accessible economic model for Bulyanhulu that reconstructs the project's history, forecasts its future, and objectively quantifies the impact of some of the key fiscal concessions it has benefitted from.

The first phase of Open Oil's work has been done without any interaction with Tanzanian government or civil society organization (CSOs). Open Oil hopes that the analysis can be further improved through collaboration, and that it will facilitate improved dialog between all of the project's stakeholders.

History

Gold was discovered at Bulyanhulu by a herdsman in 1976, and initial exploration was done by the Government through the State Mining Company (Staminco). Several foreign mining companies undertook further exploration and, after the exploration rights changed hands several times (with some ownership disputes along the way), the government signed a Mining Development Agreement with Kahama Mining Corporation Ltd (Kahama) on 5th August 1994. Kahama was a subsidiary of Sutton Resources Ltd (Sutton), a Canadian listed company. Sutton issued a [prospectus](#) in 1997 seeking to finance the continued evaluation of the Bulyanhulu deposit.

In 1999, Sutton resources was acquired by Barrick Gold Corporation (Barrick), a large US based gold producer, for US\$281 million¹. Barrick started developing Bulyanhulu in 1999, and production started in April 2001. At the end of 2001, Barrick quoted Reserves of 12 million ounces,² showing that further exploration work had tripled reserves from 3.6 million ounces at the time of the acquisition.³

Through various corporate takeovers during the 2000's Barrick gold had acquired several other gold mines in Tanzania, and in March 2010 Barrick floated African Barrick Gold (ABG) separately on the London stock exchange, raising £547⁴ million (\$820 million) for a 25% stake, with Barrick remaining majority shareholder. ABG owned the Bulyanhulu, Buzwagi, North Mara and Tulawaka mines, and a large number of prospecting and exploration licenses.

ABG changed its name to Acacia Mining (Acacia) in November 2014 and at the end of 2014 Barrick group companies still owned around 63% of Acacia.⁵ On 30 June 2015, Acacia's [market capitalization](#) was around £1.3 billion (\$2 billion), which mainly reflects the after tax value of its Tanzanian mining projects.

The 1997 Mineral Sector Review

The report from the [2008 Bomani review](#) sets out the context for and details of the 1997 reforms. These included:

1. A new Mining Policy 1997;
2. A new [Mining Act 1998](#), which established royalties of 3% for gold⁶;
3. Revisions to the Foreign Exchange Act 1992; and
4. Income tax changes in the [1997 Financial Laws \(Miscellaneous Amendments\) Act](#).

The income tax changes included immediate write off of capital investment (100% depreciation), plus an [Additional Capital Allowance of 15%](#) on “unredeemed” (unused) capital expenditure deductions, meaning capital deductions not yet offset against taxable income. The latter is effectively an uplift on carried forward losses, and is the most controversial fiscal incentive included in the 1997 reforms, discussed further below.

¹ [Barrick 1999 Annual Report p62](#)

² [Barrick 2001 AR p38](#)

³ [Barrick 1999 AR p26](#)

⁴ £547 million UK pounds (\$820 million) was raised for a 25% stake in ABG, valuing the company at £2,325 Billion (\$3.5 billion). [ABG 2010 Prospectus p40](#)

⁵ [Acacia 2014 AR p108](#)

⁶ [1998 Mining Act, Article 86](#)

The Kahama Mining Development Agreement

Tanzanian MDAs remain confidential, but the Bomani review and a [2001 Barrick press release](#) set out key fiscal terms. These include:

- 3% royalty of the net-back value⁷ of minerals, as per the 1998 Mining Act
- Corporate income tax of 30% (the generally applicable rate)
- 100% depreciation for prospecting (exploration) and development capital expenditures
- Additional allowance of 15% on unredeemed capital allowances
- Unlimited loss carry forward
- 10% withholding tax on dividends
- No withholding tax on interest on loans from third parties
- Withholding taxes on technical (3%), management (3%) and professional fees (20%)
- 0% customs duties on imports until the end of the first year of production, and 5% maximum thereafter
- Relief from VAT on most services and goods
- No export tax. Mineral exports subject to a VAT rate of 0%.

Other notable items mentioned in the Barrick press release include:

- Fiscal terms are stabilized over the 25 year term of the Mining License.
- The right to enter into loans to finance the mine construction
- An MDA revision in 1999 eliminated a previously existing 5% carried interest ([Box1](#)).

Most of the fiscal terms described here are are arguably fairly conventional, and consistent with those that would be sought by most large mining companies for investing in a developing country in the late 1990's (or indeed today). The exception is the 100% depreciation together with its 15% additional capital allowance.

Box 1: Government participation in Bulyanhulu

Bomani (p57; p94) sets out the history of government participation in Bulyanhulu. In the original 1994 MDA the government had 15% equity in Bulyanhulu. The context suggests this was “free” equity meaning the government would get 15% of dividends, but would never be under an obligation to contribute to project costs.

10% of this equity was given up in return for the project being subject to 10% Dividend Withholding Tax which the government introduced in the general mining regime, but which the original Bulyanhulu MDA would not have allowed. We note that mathematically 10% free equity is identical to a 10% dividend withholding tax, so this would seem on the face of it to be a fair swap – but both are subject to the discretion of company management declaring a dividend.

Bomani states that the remaining 5% interest was sold back to Barrick (per the Barrick press release in October 1999) for \$5 million plus a commitment to spend \$100,000 per year on training Tanzanians. The potential valuation of this 5% remaining is considered

⁷ The value of contained metals, minus transportation, treatment and refining costs.

below.

Reforms post 1998

Tanzania soon reversed some of the 1999 concessions, and has made further changes to its fiscal regime. Several of these changes were at least partly in response to concerns that the fiscal regime as it stood in 1999 was too generous. These included:

- Additional Capital Allowance was eliminated in 2001⁸
- New depreciation regime for mining in the 2004 Income Tax Act; mostly 20% or 25% (meaning depreciation over 5 or 4 years straight-line, respectively)
- Royalty on gold increased to 4% on gross value (Mining Act 2010)

Negotiated changes to the Bulyanhulu fiscal regime

Because the Bulyanhulu agreement preceded these changes, and its main terms were stabilised, these sector-wide changes did not apply to the project.

Nevertheless mining companies came under pressure to give up some of the concessions they benefitted from under their stabilised MDAs, in response to public perception that large projects were not paying their fair share,

The [2010 ABG prospectus \(p69 and p255\)](#) states that although entitled under the MDA to continue indefinitely taking advantage of the 15% Additional Capital Allowance (ACA), Bulyanhulu had voluntarily agreed to forego the ACA from 2007 onwards. As we show below, this significantly brings forward the point at which income tax will eventually be paid by the project, or rather, ensures that the project should actually pay some income tax towards the end of this decade.

In 2012 ABG agreed to move to a 4% royalty⁹ on a net-back basis.

Reconstructing Bulyanhulu's Production and Cost History

The [Bulyanhulu Documentation Index](#) sets out the specific references used, but generally information on Bulyanhulu's actual production and costs was obtained from Barrick Annual reports, the ABG prospectus and then ABG/Acacia annual reports.

With the exception of 2006, data was available for each year. In 2006 Barrick switched to reporting on a whole of Africa "segment" basis and did not report separately on Bulyanhulu. For this year we assumed 2006 was the average of 2005 and 2007.

Annual report data are highly aggregated, and not always easy to interpret. We have made a few assumptions to simplify the analysis.

⁸ [Bomani p103](#), presumably in the 2001 Finance Act

⁹ [ABG annual report 2012 p13](#)

1. **Only gold production is modelled.** Bulyanhulu produces mainly gold, but also copper and some minor amounts of other metals. We have modeled only gold production, and have used ounces sold in each year where available. In annual reports revenue from copper and other “by-products” have been netted against operating costs and so have reduced the “cash cost per ounce” statistic that we use to calculate operating costs - so they are taken into account in our cashflows. But for calculating the royalty we assume that by-product revenues would add 7% to gold revenues, which is the average from ABG annual reports from 2009 - 2014.
2. **We use spot gold prices.** From 2010 ABG has a policy of not hedging gold prices, though it does some hedging of copper prices.¹⁰ It is difficult to tell whether Barrick had a material gold hedging program at a corporate level prior to 2009, and impossible to tell whether their Tanzania subsidiary did so.¹¹ Our analysis assumes that Bulyanhulu gold was sold at the average spot price for each year, sourced from the [World Gold Council](#). If there was a material hedging program, realised prices would be different from spot prices ([Box 2](#)). From 2009 ABG separately disclosed Bulyanhulu revenues in its segment note. This shows a very close match with the model¹², which suggests firstly that the model is reasonably accurate, and secondly that ABG was realising prices consistent with spot price for its sales.
3. **We make a simple assumption about Transportation and refining costs.** Until 2012 royalty was 3% on a net-back basis, and thereafter 4%. For calculating the royalty we assume that the costs that would be deductible from gross revenues representing 5% of revenues. For deriving cashflows we assume that these costs are already included in the cash cost per ounce we sourced from annual reports.
4. **We have emulated two project financing episodes.** The MDA makes clear that finance charges are tax deductible. We have reconstructed the \$200 million project financing that Barrick took out in 2002, and the model calculates approximate finance charges as if this was the only debt until 2013 when a new project financing for \$142 million was put in place to fund processing investment. It may be that further capital provided by Barrick to its Tanzanian subsidiary was in the form of inter-company debt, and that therefore deductible finance charges might be higher.
5. **Import duties are modeled simply.** We arbitrarily assume that 25% of costs will attract import duties of 5%, from the second year of production.
6. **We include only direct fiscal revenues.** We model royalties, income taxes, import duties and withholding taxes on dividends. We do not model taxes on wages, or withholding taxes on payments to suppliers.

¹⁰ [ABG 2010 Annual report p68](#)

¹¹ Hedging gains or losses would presumably need to be incurred by, or passed on to the Tanzania subsidiary to be recognized for Tanzania fiscal calculations.

¹² Cumulative difference over 2009 - 2014 inclusive is \$8 million out of \$2.08 billion, or 0.4%. Some difference would be expected due when in the year gold sales occurred; we use the average price for the year.

Box 2. Hedging as a source of fiscal risk for developing countries

Major gold miners used to hedge a significant portion of production. When prices rose significant hedging losses incurred - i.e. the fixed “hedged” price turned out to be far below the actual spot price of gold.

For example, in 2009-10, as the spot price of gold soared, AngloGoldAshanti posted losses of \$2.2 billion for unwinding its hedge book. Some of these losses may have been claimed as tax deductions for the Geita mine in Tanzania.

Hedging is a highly complex and technically challenging for tax administrations to manage. There has been an emerging best practice in developing countries to require hedging gains and losses to be segregated from mining so that mining fiscal revenues are not subject to the risk of bad hedging decisions by mining companies. This forms part of a portfolio of tools at the disposal of governments to manage commodity price risk, including special fiscal rules and stabilisation funds.

Forecast production and costs from 2015

Forecasts for production, operating and capital costs through to the end of 2019 are set out in the Acacia presentation [2015 Analyst Site Tour Pack](#). We have inferred approximate figures from the charts on pages [36 \(Production, Head Grade, and All In Sustaining Cost per Ounce\)](#) and [37 \(CAPEX\)](#). From 2020 on we assume the 2019 figure holds constant for gold production (350 thousand ounces per year) and operating costs per ounce (\$450/ounce). We assume total capital costs reduce from around \$90 million in 2019 to \$70 million for the duration of the mine life.

We assume that production continues at 350 thousand ounces per year for the [remaining 34 years stated](#) in the [2015 Analyst Site Tour Pack](#). This means 12.2 million ounces of further production from 2015 - 2048 inclusive which is consistent with the 12.6 million ounce total of 9.2 million ounces of reserves plus 3.4 million ounces of Indicated Resources as at the end of 2014, see [page 14](#).

Actual, annual average spot gold prices are assumed up to 2014. From 2015 on we assume a gold price of \$1,200 per ounce, increasing at 2% inflation per year (in other words \$1,200 held constant in real terms).

All of these forecast parameters can easily be changed on the model dashboard.

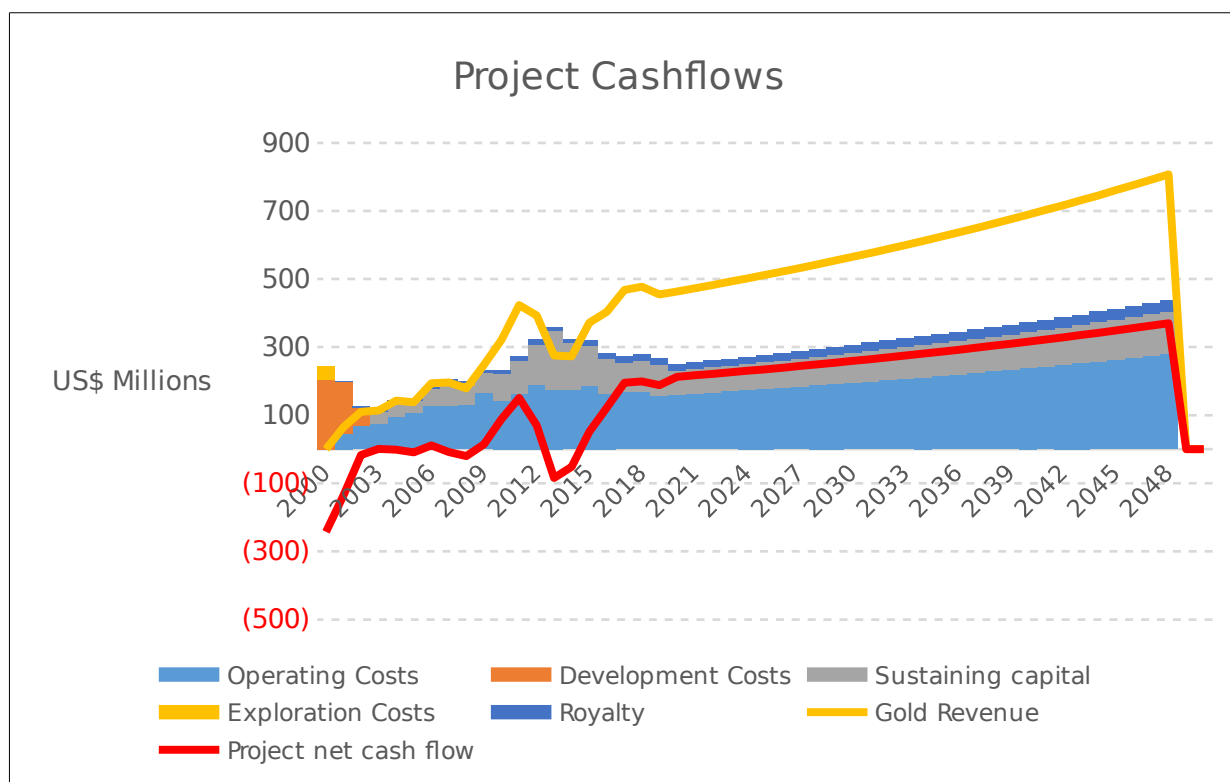
Results

Project economics

The first observation is that Bulyanhulu has not been particularly profitable to date. This may seem counterintuitive in a flagship project, which by our calculation has generated some \$3.6 billion in gross revenues to date, but it is important to look in detail. The net

cashflows of the project - the red line in [Figure 1](#) - were negative through to 2009, and after a couple of positive years turned negative again in 2013/14. A range of operational and other challenges are referenced in ABG reports and it seems the project has struggled from the outset with high unit costs. Bulyanhulu is high grade, but also an underground, and therefore relatively expensive mine.

Figure 1



This means that to date there has in fact been little profit for the government to tax. We see a significant uptick in profitability from 2015 on resulting mainly from reduced operating costs per ounce. We note that these are forecast, and yet to be demonstrated.

Measured over its entire life, Bulyanhulu is not particularly profitable on a pre-tax basis. The Internal Rate of Return (IRR) is only 13.1%, which is pretty marginal - mining companies would likely aim to make at least 10% on an *after tax* basis for relatively high-risk developing country investments. Net cashflows are \$9.7 billion undiscounted, or \$282 million discounted at 10%. Hardly a bonanza.

Because of the long project duration, these results are very sensitive to the discount rate assumption. If the 10% discount rate is reduced to 8% for example, the project NPV jumps from \$283 million to \$640 million.

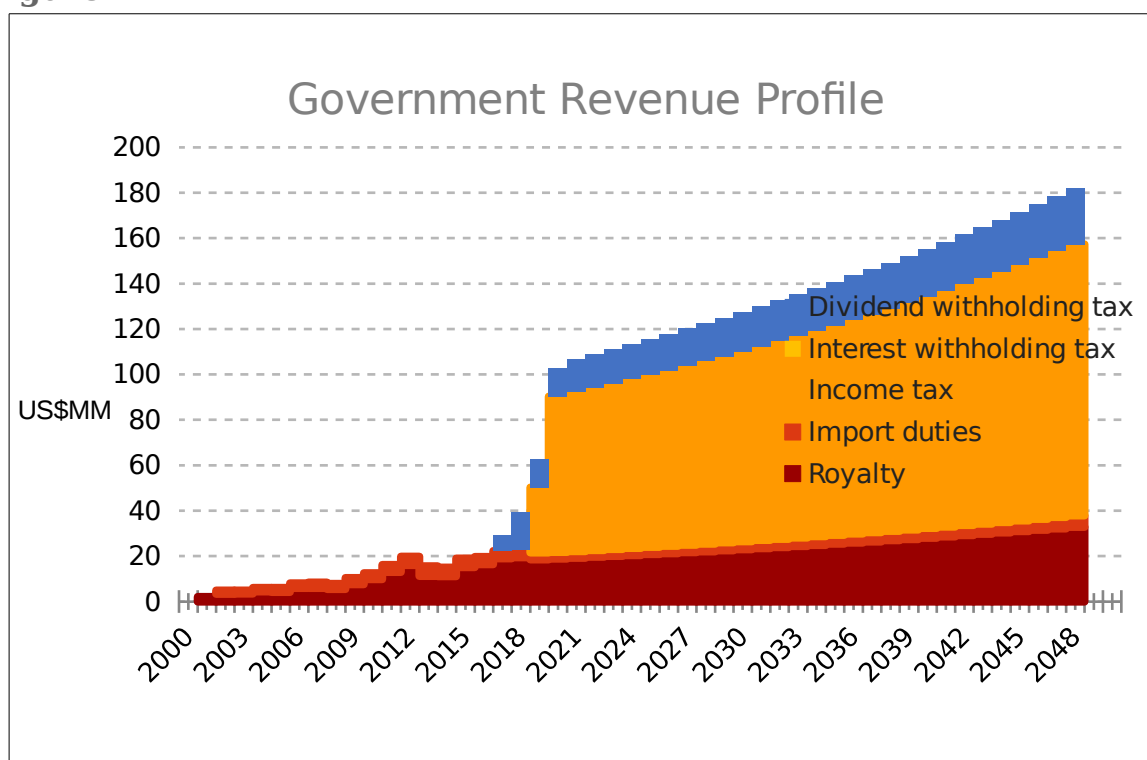
Government revenues

[Figure 2](#) shows government revenues for the life of the project, based on the model calculations. Thus far (in terms of direct revenues) Tanzania will have collected only royalties

and import duties. The project only starts paying income tax in 2019, and modest amounts of dividend withholding tax a couple of years before that. Despite profits from 2015 on, it takes that long for carry forward tax losses and the remaining balance of Additional Capital Allowance to be used up. After 2019 Tanzania receives around \$100 million per year from the project, broadly increasing with 2% inflation per year. To put this in context, the government tabled a budget for the 2014-15 financial year before parliament of about \$9 billion.

If the gold price were to average \$1,100 from 2015 on rather than \$1,200, income tax would start one year later in 2020, and total government revenues would be around \$90 million per year, plus inflation. If gold prices sank lower, as they do in some long-term predictions, then it is possible the project might never move into profit to pay income tax.

Figure 2



Government share

Total direct government revenue over the life of the project is \$4.4 billion, which is 45% of the undiscounted net cashflow. When discounted at 10%, government Net Present Value (NPV) is \$255 million, which is 90% of the project NPV¹³. Thus, the fiscal regime now applied to the project actually captures a majority of the economic value of the project, mainly because the project is not very profitable in the first place. Although 3% appears a relatively modest royalty rate, it is charged on revenues irrespective of profitability, and so is a regressive mechanism - it takes a relatively higher share of profit, the lower that profit is. (Box 3). That

¹³ Government share measured in NPV terms is always higher than undiscounted because the mining company meets all of the negative cashflows which happen early in the project life, and have a higher "weight" in the NPV calculation.

is why - from a general fiscal regime design point of view - royalties cannot get too high without shutting down projects, or preventing them from going ahead at all.

With 8% discounting government share of NPV is 64% - still a significant majority.

Investor outcomes

The mining company after tax IRR is 10.5%, with undiscounted net cashflows of \$5.2 billion. However, the NPV10 of those cashflows is only \$37 million (NPV8 \$234 million). This is hardly a huge reward for risking around \$500 million for the initial development, and managing a major project for over 40 years. It might of course be argued that Barrick/Acacia has not managed this crown-jewel Tanzanian asset optimally and that these results reflect problems of their own making. This is not something Open Oil can express an opinion on.

Moreover - IRR and NPV are not everything: Bulyanhulu should be generating something like \$120 million after tax net cashflow for Acacia from 2019, with a 2015-forward NPV10 of \$1.4 billion. It is interesting to compare this NPV to the roughly \$2 billion market capitalisation for Acacia as a whole. Acacia's other Tanzanian operations Buzwagi and North Mara are both smaller and have limited remaining mine life ([5 and 9 years](#) respectively). These mines, plus the value the market perceives from Acacia's exploration rights in Tanzania, Kenya and Burkina Faso, might together account for the \$600 million balance of the market capitalization, suggesting our Bulyanhulu value could be in the right ballpark. But this is obviously speculative.

The impact of 1999 fiscal regime concessions

As discussed above, two aspects of the fiscal regime that have proven controversial are the 100% depreciation and particularly the 15% Additional Capital Allowance. What impact have these had?

Depreciation.

This is pretty simple to deal with. If 20% straight-line depreciation had been applied rather than immediate write-off it would have virtually no impact on government revenues. This is because Bulyanhulu did not earn enough profit before tax during the early years of production to have been in a tax paying position during the first 5 years, even with 5 year depreciation.

In our base case, total taxable income (before Additional Capital Allowance) over the first 5 years of production was around \$120 million (aggregate of 2001 - 2005 from row 62 in the CALCULATIONS sheet). This is materially less than the \$452 million total exploration plus development cost spent to get the project built. Therefore the project would have still been in a tax loss position at the end of 5 years.

Depreciation rules can in principle have a material impact on the timing¹⁴ of government revenues in a profitable project that would otherwise be in a tax paying position; but not in this case.

Additional Capital Allowance

There are controversies about the very existence of the ACA, but also apparently about how it is calculated.¹⁵ We have interpreted Part III of the Second Schedule of the Income Tax Act, as amended by the [Finance Laws \(Miscellaneous Amendments\) Act 1997](#), as follows:

1. All expenditure is deductible in the year it is incurred ([Section 17](#))
2. An Additional Capital Allowance of 15% is allowed on unredeemed qualifying capital expenditure, which include development costs, but not prospecting (exploration) costs. ([Section 18.1 & 2](#))
3. The “allowance base” for calculating the ACA includes previously earned ACA, meaning that the allowance compounds. ([Section 18.3](#))

We understand that whether or not the ACA compounds has been part of the controversy.¹⁶ We interpret the compounding formulation as in effect turning the 30% income tax in effect into a form of Resource Rent Tax, such that income tax would only apply if the project achieved a rate of rate of return exceeding the ACA rate of 15%.

The ABG prospectus hints at the compounding issue [in page 69 \(and further in page 255\)](#) where it refers to the agreement to “end the compounding” from 1 January 2007. We have interpreted this to mean ABG would not recognize any new ACA from 2007 on, or keep compounding the 15% on top of existing ACA, but would be entitled to claim accumulated ACA up to the end of 2006 to offset future income tax. [Page 255](#) of the Prospectus states that a total of previously claimed but still unused deductions (we presume referring only to ACA) of \$431 million was at stake as at the end of 2009.

In our model, as at the end of 2009, Bulyanhulu has an aggregate balance of \$922 million that could be offset against future taxable income, comprising \$452 million of unredeemed capital expenditure plus \$471 million of accumulated (with compounding) ACA. It is only once these balances are fully offset by profits that Bulyanhulu will pay income tax, which takes until 2019 in our model. We note that our \$471 million is broadly consistent with the \$431 million mentioned in the preceding paragraph, but it is not entirely clear these are referring to the same thing so this may just be coincidence.

What would be the case if the ACA had not been part of the fiscal regime in the first place?¹⁷ In this case, Bulyanhulu would pay \$127 million in additional tax over its life (\$471 million ACA x 30%); and income tax would start in 2017 rather than 2019. [Figure 4](#) shows the comparison.

¹⁴ But not the total revenues over project life

¹⁵ 2010 ABG prospectus, page 25

¹⁶ Bomani report pp 7; [103](#)

¹⁷ This can be modeled simply by setting the 15% ACA parameter on the DASHBOARD to 0%

Rather than 10.2% IRR, the mining company would make 10.5% over the whole life of the project. Government revenues would be \$4.48 billion rather than \$4.36 billion, or 3% higher. Government undiscounted share would be increased by 1 percentage point from 45% to 46%.

Thus allowing the ACA up till 2006 does not make a huge difference to the outcomes from the project over its lifecycle. It might, however, be significant in terms of

However, what if the ACA had continued compounding, as per our (and, we infer, the mining companies) interpretation of the original 1997 finance act? In this case Bulyanhulu would certainly never pay income tax - the increase in the ACA balance through compounding would easily exceed the total taxable profits from the remainder of the project's life, assuming a \$1,200 real-terms gold price. Under our "Resource Rent Tax" interpretation this in fact makes sense - a project that did not generate more than 15% return would not pay income tax: recall that Bulyanhulu's pre-tax IRR is only 13%.

This would make a huge difference to the government. Relative to allowing ACA only until 2007, the government would forego \$2.4 billion in income tax (or roughly \$2.5 billion relative to having no ACA at all). In this sense, the agreement reached was a good outcome for the government.

The gold price (from 2015) would have to rise to \$1700 per ounce or more before material income tax would be collected. At this price the pre-tax return of the project of 16.1% exceeds 15% ACA).

Conclusion

So, there is a reason Bulyanhulu has not yet paid income tax - lack of profit. However, if the gold price holds, and Bulyanhulu sorts out its production and cost issues, Tanzania should see income tax later this decade.

An obvious question is whether the ACA was too generous in the first place? This can only be answered by considering the circumstances in which the policy was put in place. In the late 1990s gold prices were below \$300 per ounce and falling. It might have been thought that if Tanzania wanted to develop a gold industry, it would have under those circumstances needed to do something significant to attract investment.

What is unknowable is whether, in the absence of the 1999 incentives, these investments would have occurred at all, or potentially not till much later. Whether that would have been a good or bad thing for Tanzania is beyond the scope of this report.

Figure 3

