

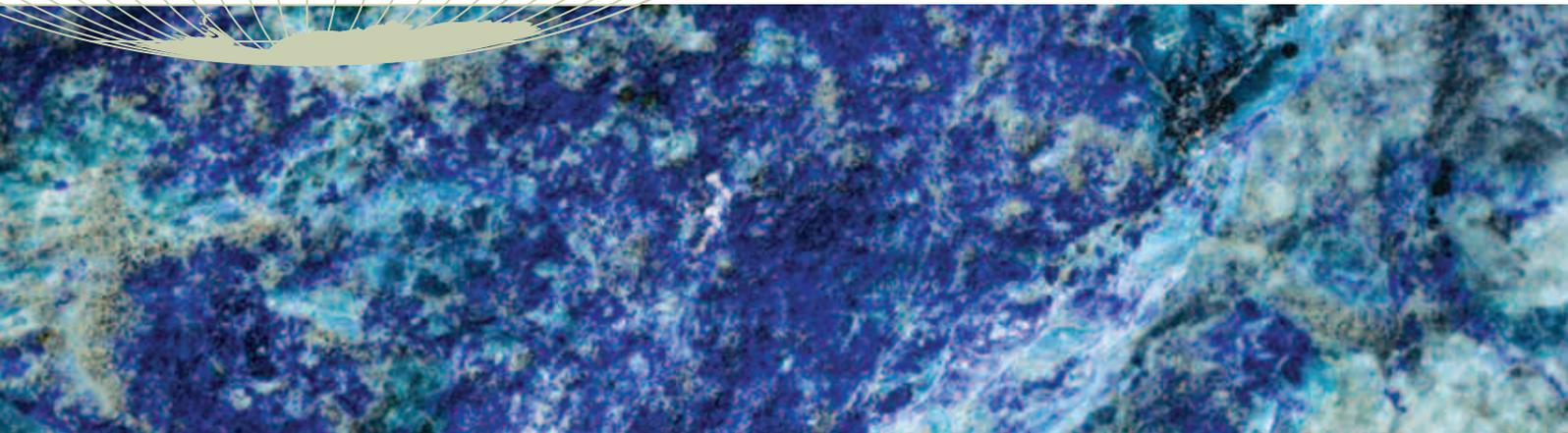


Mining in Tanzania – What future can we expect?

The Challenge of Mineral Wealth:
using resource endowments to foster
sustainable development

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This paper is the latest in a series on mining and its social and economic impacts that have been prepared under the auspices of the Resource Endowments initiative (REi) of the International Council of Mining and Metals (ICMM). It provides an objective basis to help the Tanzanian government to examine the debate between (1) the need to encourage the mining sector as a dynamic contributor to economic growth and (2) the alleged failure of the mining sector to contribute sufficient revenue to the public purse and to make an appropriately large socio-economic contribution to local communities. In doing so, it represents an input into government decision-making regarding the Bomani Committee Report and other recent suggestions for reforming the sector.

This paper was written by Alan Roe and Mark Essex of Oxford Policy Management. It was presented at a workshop of key government figures in Dar es Salaam on 18 May 2009 where it generated a healthy debate about the future of mining in Tanzania. The aim of this workshop and of this revised paper is to help the government in its difficult decisions about the implied choice between ongoing support for a policy regime that favours high rates of mining sector growth versus a short-term approach of raising revenues at the risk of lowering sectoral growth in the future. In fact, one of the key discussion points of the workshop focused on this issue of an inherent tension between a government's short-term perspective and investor's longer-term outlook. The paper addresses these objectives by adopting a forward-looking approach.

Following a short introduction (Section 1), the Report comprises the following sections:

- Section 2 presents a stylized description of the various macroeconomic contributions that mining can be expected to make;
- Section 3 documents the contributions that the mining sector can be said to have actually made to the Tanzanian macroeconomic situation in the period 1999 to 2008;
- Section 4 examines the 'life cycle profile' of mining operations by utilizing some innovative new direct evidence and approaches from the major Tanzanian mines;
- Section 5 highlights three key conclusions that emerge from our life cycle analysis; and,
- Section 6 looks selectively at some of the policy issues that are informed by our analysis.

Section 2: The General Contributions of Mining

The examination of mining's general macroeconomic contributions across several countries leads to the following broad statements:

1. Mining can readily become the main source of a country's foreign direct investment (FDI). If this happens (as is already the case in Tanzania) the volume of domestic investment is also likely to be significantly increased;
2. Mining can also become a major foreign exchange earner by generating new forms of exports. These new exports can easily (and quickly) supplant long-standing traditional exports in this role;
3. Mining can often contribute a share of government revenues that is high relative to its share of Gross Domestic Product (GDP). This is because large scale mining is a visible and easily taxed activity compared with many more traditional activities including agriculture, the majority of small scale manufacturing and artisanal mining;
4. Mining in its more modern forms is unlikely to contribute a large proportion of a country's (GDP). This is for the simple reason that it is a

highly capital intensive activity. Its contribution to a country's Gross National Income (GNI) is likely to be even smaller because of the outflows of mining company dividends and interest in debt that represent part of the difference between GDP and GNI; and,

5. Modern mining cannot be expected to make a massive contribution to direct local employment levels. Again this is mainly because of the high capital intensity of the activity and less because of the choices as between expatriate and local employment as is often asserted.

Section 3: The Tanzanian Record through 2008

Examining these propositions against the Tanzanian record of the past decade we find the following:

- the improvement in Tanzania's ability to attract (FDI) in the past decade has been truly remarkable. As UNCTAD's 2008 World Investment Report shows, this increase has now placed Tanzania in the higher ranks of African economies in terms of FDI and at the very top of the list in terms of non-oil countries. The major single reason for Tanzania's sustained high performance in recent years has been the massive new inflows of capital for investment in the mining sector;
- the very significant growth of *total exports* seen in Tanzania since 1999 is almost wholly accounted for by the growth of the non-traditional export sectors within which mining products and manufactures are the major elements. The share of gold mining exports in total non-traditional exports rose from only 10% in 1999 to more than 53% in the peak year of 2004. Exports of gold have also easily out-grown the traditional agricultural export crops such as coffee that for so many years were the leading foreign exchange earners for the country;
- as regards the level and rate of *growth of GDP*, the evidence shows the share of total GDP attributable to mining has risen clearly and consistently if only by a small absolute amount. Coincidentally the magnitude of that increase (2.1% of GDP cumulatively since 1998) is almost

'Mining has now placed Tanzania in the higher ranks of African economies in terms of FDI and at the very top of the list in terms of non-oil countries.'

equal to the cumulative decline that has been seen over that same period in the GDP share of manufacturing. Mining and the construction sector are the only identifiably dynamic sectors in the overall and impressive GDP growth seen since 1998; and,

- an assessment of the *government revenue* contribution of mining is hampered by data difficulties. However, merely on the basis of the taxes paid by the four largest mines, and using relatively conservative assumptions as explained in the main text, then total revenues from these four mines had grown from almost nothing to US\$76m per annum by 2007. If we adopt somewhat more realistic assumptions then the revenue total from the four mines alone amounted to about US\$100m per annum by that date. No one would claim that these numbers are huge. However, they represent the equivalent of between 3.1% and 4.3% of the total tax revenues achieved by the government; to about one third of all the government's receipts from all import duties; and to more than the actual receipts from the Heavily Indebted Poor Countries Initiative (HIPC) debt relief in the last years when this was provided.

Overall, these macroeconomic contributions are substantial and they represent an important part of the explanation of Tanzania's overall strong performance in macroeconomic terms in recent years. This is especially so given the very short life span of the new mining investments: in a real sense this is still an industry in its infancy in Tanzania.

Section 4: The Forward-Looking Analysis

This section presents the results of the new and innovative data analysis that has been conducted. This uses full life cycle data for three of the largest mining companies in Tanzania and for four main operating mines (North Mara, Bulyanhulu, Geita, Tulawaka) plus two new mines (IAMGold and Buzwagi for which expected production data was also included). The data provided spans the period from 1999 through 2034. The main results were organized under the headings of

- (1) Production
- (2) Balance of Payments
- (3) Government Revenues and
- (4) Employment.

The main results are as follows:

Production

There is likely to be a further growth of gold production on top of the rapid increase already seen since 1999. These further increases will persist until around 2013–2014 when output levels from the identified mines collectively will begin to decline. This decline will accelerate faster between 2020 and 2025 when three of the four mines are likely to reach the end of their natural lives (North Mara, Geita and Tulawaka). Output from the four mines will dip below the 1m ounces level in about 2022 – a figure *lower* than that achieved in all years from 2002 through 2008. On the basis of this evidence there will be a large gap to be filled in some 10–12 years from now (equivalent to the need for two more mines of the size of AngloGold Ashanti's (AGA) Geita mine) *if the authorities want to receive the same contributions from gold mining as in the recent past.*

Balance of Payments

The present *export earnings* from gold of somewhat more than US\$700m (US\$770m for all mining) seem likely to rise to almost double that value to reach a total of around US\$1.4bn in the period 2012 to 2016. Thereafter there is likely to be a significant decline so that by 2023 export earnings from gold will be lower from these identified mines than has been the case in the recent past. The figure will decline further and will be less than US\$400m by about 2025. The numbers encapsulate potentially different views about the future of the gold price as explained in the main text.

There are four main deductions from export earnings needed to assess the overall *current account* contribution of mining. These are imports for capital construction, imports for mining operations, interest payments on international debt and dividend payments to shareholders. The results indicate a significant overall trade deficit in the earlier intensive construction years up to and including 2001 attributable to the large imports of capital equipment. However, in all years from 2001 onwards to 2034 the sector realizes a trade account surplus: in the peak years from 2014 to 2017 the trade surplus should be close to US\$900m. In part this is because of the fortuitous staggering of the construction outlays of the mines for which we have data through time. The high import costs of some of the later mines after 2000 came at a time when the earlier mines were already generating off-setting export earnings. Tanzania also has the scope to increase the trade surplus even more than shown to the extent that increased local procurement can be encouraged. Factoring in the interest payments on international debt, although these payments are large in their absolute total amount, their impact on the current account surplus in most years is small. So Tanzania seems able to look forward to a sustained period of some ten years from 2011 when the mining-generated current account surplus could be in the region of US\$600m to US\$800m per annum.

Government Revenues

The responses that were provided on this matter by the companies were on the basis of the tax regime now in place and so do not reflect any possible changes that have been under discussion following the Bomani Committee recommendations. The evidence confirms one of the points of the critics of mining that in the early years of their licensed activities in Tanzania the companies paid only very modest amounts of tax in total.

However, once the actual mining operations began in Resolute's Golden Pride mine in December 1998, Geita (July 2000), Bulyanhulu (2001) and North Mara (2002) the revenue receipts of government rose rapidly to the current (2007 and 2008) level of around US\$80m to US\$90m per annum. Looking forward the data tell us that the revenue from the existing identified gold mines alone will rise to a peak of over US\$280m: three

times today's levels by 2017 and thereafter decline. The peak revenues will be achieved in large measure because of a large absolute and proportionate increase in the yield from the corporation tax as the depreciation allowances unwind: at the peak this tax alone is expected to yield some US\$186m a year. From about 2016 the corporation tax is also unambiguously and continuously the most important source of mineral sector tax receipts even assuming the continuation of the present tax regime. This continues to be the case even in the later years when the levels of mining production are in decline. Assuming a nominal growth rate of total government tax revenues in dollar terms of 5% per annum through 2017, then total tax revenues would rise to US\$3.87bn. At that date mining revenues would account for 7.3% of the total. With a higher rate of growth of total revenues of, say, 7% the mining share would be 6.1%. At a slower rate of growth of total revenues of, say 3.5%, the mining share would be 8.2%.

In brief, the evidence indicates that even under the present Tanzanian tax regime the tax contribution of the existing major gold mines alone will rise very significantly through 2017 in both absolute dollar amounts and as a proportion of total government revenues. Thereafter the tax take will begin to decline because of falling production levels. At that stage if not before, the government will need to rely on payments from new mining activities if it wishes to enjoy a sustained high tax yield from the sector. The pattern we see here is not unusual – it is evident also in data from other countries where a life cycle analysis has been possible.

Employment and Wages

Mining in Tanzania is still very much in its infancy with many of the large gold projects still in various stages of construction. In the early stages of the mining life cycle in Tanzania as in other countries there has been a rapid and large build up of the direct employment associated with the construction of the mine(s) and the associated infrastructure. In Tanzania the companies report the peak of the construction employment as being in 2009 when some 6,600 workers are engaged for this activity. With construction ending in some projects and the commencement of a steady-state of operational workers in others, it is expected

that by around 2010 the total workforce across the four mines should attain a level of some 3,100 workers. Prior to this happening however, total direct employment peaks at a level of 12,000 workers and then settles down to a level of between 7,000 and 8,000 workers thereafter – assuming the lives of the mines are extended through new investment or new mines are constructed. Total employment begins to decline significantly on the basis of present plans after about 2022. Within these totals, expatriate employment is anticipated to peak at some 1,100 workers in 2009 but thereafter to decline rapidly to only 450 staff by around 2015: a small percentage of the overall employment total.

The wage bill associated with direct employment in the mines increases to a total of more than US\$200m per annum during the construction phases but also exceeds US\$100m for much of the operational life of the mines. These figures exclude the often considerable labour element in contract work and in the ongoing capital upgrading that occurs throughout the life cycle: a cost that adds up to US\$30m in some years. These numbers partly reflect the relatively high average wages and benefits paid by the mining companies.

The employment numbers may be considered quite small in absolute terms but they are far from trivial given the much higher than average wages and benefits that are paid. The total Tanzanian labour force comprises an estimated 16.9m persons. But of these, the vast majority (estimated at 13.9m) are engaged in agricultural work including subsistence activities. This leaves a non-agricultural total of around 3m of whom the majority – 2.44m – are engaged in trade and other services including public administration. The remaining sectors such as manufacturing, *mining*, utilities, transport, and construction are all small employers in absolute terms. According to the Labour Force survey they account for 1.5%, 0.2%, 0.1%, 0.7% and 0.9% of total employment respectively. So, for example only the manufacturing sector employs more than 1% of the total labour force.

Furthermore, even in less well developed economies the numbers of indirect jobs created from the stimulus of mining can be significant:

in African economies similar to Tanzania, employment multipliers have been seen in the region of 3 or more indirect jobs for every directly created job. In this context the 10,000 or so direct and increasingly skilled jobs associated with the specific mines for which we have data can be seen as an opportunity to create a very much larger number of indirect jobs. These additional jobs will arise through the opportunities created by the mining companies' own spending and also via the induced effect on local businesses of the spending of miners' wages. This opportunity remains to be grasped in Tanzania and is the subject of further comment in Section 6.

Section 5: Key Conclusions

There are *three* key conclusions from the analysis. These are as follows:

- Mining in Tanzania and especially gold mining has quickly (since 2000) become a major part of Tanzania's current macroeconomic performance and its recent successes in achieving higher rates of economic growth. This contribution of mining can be seen in relation to Tanzania's recent strong performance in several areas including above all the attraction of new FDI, export earnings, and GDP growth. In other areas such as government revenue mobilization and employment the sector has played a large part also but the full potential benefits are yet to be seen.
- The forward-looking data provided to the researchers by Tanzania's leading gold mining companies enables us to see the broad tendencies over the next 10–20 years with some clarity. *This suggests that the sector can look forward to a further period of expansion but one that will not be sustained without new discoveries and the opening up of new pits.* In relation to foreign exchange earnings the indications are that total export earnings can rise further to a peak of some US\$1.4bn by 2012–2016: double the present earnings. An even larger increase seems likely in the mining sector's tax payments to government to a peak of some US\$280m – almost three times the 2007 level – by 2017 of which US\$186m will come from the corporation tax. At this stage the sector seems likely to be responsible for some 6–8% of all government tax revenues! These

'In addition to the US\$2.32bn they have already invested, the companies report an additional outlay during operations of US\$2.67bn.'

expectations are linked to the feasible level of gold production from the identified mines that can increase on reasonable assumptions by a further 40% from the 2007 levels. This takes no account of new discoveries and production from the various other mines that are already present and engaged in exploration in Tanzania.

- Perhaps the most important fact to be revealed by our survey of the three companies and their five mines relates to the high level of ongoing capital investment that is needed to produce the results described. Specifically, in addition to the US\$2.32bn they have already invested, the companies report an expected additional outlay for what we have termed Capital Outlays during Operations of US\$2.67bn over the period to 2034. On average over 34 years the outlays amount annually to 3.4% of the initial capital costs of constructing the mines. These are large amounts which the companies seem prepared to make. However, it would be a mistake to assume that they are completely assured in all circumstances. For example any significant fall in the world gold price or a major increase in the tax burden on the companies would likely change the calculus at the margin and result in somewhat lower levels of new capital investment. Similarly, falling gold production, exports and tax revenues from the five identified mines will all definitely occur as they reach the end of their productive lives. If the authorities wish to retain gold as a major contributor to Tanzania's macro performance then these gaps will need to be filled by new discoveries and the opening of new mines. The capital costs of these activities are likely to be large.

Section 6: Selected Policy Implications

The information elicited by this paper provides a perspective on future mining policies for Tanzania that has not previously been exposed. That perspective sharpens our knowledge of the implications that will follow from the policy choices that the Tanzanian authorities have been actively debating for some time. The life cycle data tells us above all that the recent dramatic upsurge of mining's importance in the Tanzania macro-economy since 2000 could be sustained but might just as easily become a relatively short-lived episode in the country's economic history.

There are *two* main policy messages coming from the paper.

1. First, the *time horizons* involved in modern mining activity of the type seen in Tanzania are extremely long – certainly much longer than the planning horizons of most governments. Policy decisions when they are made should try to recognize this reality. In particular, the life cycle analysis presented in Section 4 of this Report confirms that the nine years since 2000 when the first large new mine started to operate provides an evidence-base which is far too short to assess the full contribution of the sector to the economy. Tanzania's decision-makers need to factor in a somewhat longer period – and understand its main features – if they are to recognize fully the sector's potential contribution to the economy.
2. The second main policy conclusion stems from our recognition in Section 2 of this paper that the *direct* local employment impacts of a modern mining activity are unlikely to be large in any country. But does it need to be like that in the longer term once some of the indirect multiplier effects are also considered? The answer is an emphatic *no* – the policy makers have it in their own hands to take far greater advantage from the local and regional spending associated with the new mines to achieve a much greater local and regional impact through indirect employment than that seen so far.

But this matter is definitely not resolvable by seeking more short-term revenue from existing levels of production. On the contrary, the huge ongoing total spend (on mine construction, on operating supplies for the mine, on ongoing maintenance, on miners wages and their on-spending) presents the Tanzania planners with a wholly unique opportunity to catalyze that spend as the basis for the longer term economic advancement of the mining-affected districts and regions.

So a key message from the Report is to look pro-actively for those complementary actions that have the potential to convert the direct spending of the mining companies into a much broader set of economic development benefits. The report of the Bomani Committee has many specific and important suggestions about what some of these complementary policy actions might be. Unfortunately that report itself does not present these in a fully integrated manner linked to the theme of local and regional development in the areas of Tanzania most impacted by the new mines. Rather the recommendations are presented as separate and independent ideas and are scattered throughout the report: it is largely left to the reader to join them together. In the light of this, Section 6 concludes by focusing on a few of these ideas and attempting to indicate how they might be combined into a more integrated strategy for further economic and social advancement for the Tanzanian people based on the mining catalyst. It is strongly recommended that more detailed work to develop that strategy be undertaken.

Introduction



This paper is the latest in a series of papers on mining and its social and economic impacts that have been prepared under the auspices of the Resource Endowments initiative (REi) of the International Council of Mining and Metals (ICMM). Since 2004 the REi has been examining the various factors that contribute to a successful impact from mining activity on the living conditions of the host country populations. It has also helped to clarify the various influences that can compromise that successful outcome. The REi's broad framework of analysis has been applied objectively by independent researchers in a number of countries including in a detailed case study of Tanzania carried out in 2005–2006. That study focused on just one of the new modern mines of the post-1998 period – namely the North Mara mine that is now operated by the Barrick Gold Corporation. At the time of the study it was owned by Placer Dome of Canada.

This paper takes as its starting point *two* indisputable facts.

- First, the progressive liberalization of the economy that began in 1986,¹ and was accelerated by the government of Benjamin Mkapa from 1995, has helped to shape a new structure for the Tanzanian economy. In that new structure, the private sector generally has been able to play a more active role in several sectors and to become the dominant player in some including mining and also tourism². As the Financial Times put it in August 2005....
'Recovering from the collapse of Tanzania's distinctive model of cooperative economics, the government has tried instead to be a pioneer of private sector orthodoxy'. One extremely important manifestation of this change has been Tanzania's considerable success in attracting Foreign Direct Investment (FDI) into private commercial activities. Indeed the transformation of Tanzania's fortunes in this regard after 1996 were truly remarkable, with the paltry inflows of less than US\$10m annually of

the early 1990s rising more than fifty-fold since 2000 to now average more than US\$500m per annum. In the three years to 2007 alone Tanzania attracted no less than US\$1.7bn of FDI which is more than twice the level received by neighboring Kenya!³ Within these impressive FDI totals *new mining investments have been the absolutely dominant element* with over US\$2bn being attracted into new mining projects since the sector reforms of 1997–1998.

- Second, the role of mining in Tanzania's longer term development strategy is still a matter of intense disagreement. The critics of mining in Tanzania are numerous and articulate. While they recognize that the surge of new mining activity since 1998 represents an opportunity for Tanzania of some significance, they do not agree either that the opportunity is contributing anything like enough to the economic well-being of the population in the short term or that it is guaranteed to do so in the longer term. So for example in the 2008 paper entitled *A Golden Opportunity* and sponsored by a number of faith groups, the authors contest the proposition contained in the government's own document namely Tanzania's National Development Vision 2025 that was published in 1999⁴. Specifically, the official document envisages inter alia an ongoing increase in the economic role of mining in Tanzania that will result in its contribution to GDP increasing from 3.8% in 2006 to a share that is three times greater at 10% of GDP by 2025⁵. This is one among a number of elements expected by Vision 2025 to convert Tanzania from a low-income to a middle income country by 2025. Most Tanzanians would support the country becoming middle-income by that date. But would they so readily expect or believe they can attain that status by having such a large dependence on mining? The authors of *A Golden Opportunity* point out some of the dangers they see but comment also that – 'on current trends, this is simply not going to happen'.

³ Source: UNCTAD, *World Investment Report 2008*, Annex B.

⁴ Other forward looking views about the Tanzanian economy are to be found in Vision 2020 (Zanzibar), the National Strategy for Growth and Reduction of Poverty (NSGRP, also known as MKUKUTA – Kiswahili acronym), the Zanzibar Strategy for Growth and Reduction of Poverty (ZSGRP, also known as MKUZA – the Kiswahili acronym) and in the Joint Assistance Strategy (JAS).

⁵ To put this into context monetized agriculture currently accounts for about 16% of Tanzania's GDP. So allowing for some relative decline in the share of agriculture, the vision is that by 2025 the mining sector will have virtually caught up with agriculture in this respect.

¹ This was under the umbrella of the so-called Economic Recovery Program No 1 (ERP-1).

² The reforms of the new Mkapa government from 1995/96 involved a wide ranging program based upon tighter fiscal controls and structural reform of institutions. These included investment deregulation, a privatization program, the freeing up of goods and factor markets, and a complete reform of the financial sector (Naschold & Fozzard, 2002). The key to this program has been the government's willingness to entrust productive activity to the private sector.

The tension between these two basic facts represents a huge and fairly immediate dilemma for the government as it considers the numerous recommendations of the recent high level Report drafted by the Presidential Committee chaired by Judge Mark Bomani⁶.

The government seems to have several possible choices. First, it could continue to support the liberal policies that have successfully regenerated a large mining activity in Tanzania in the past decade and hope to see the sector growing in something like the manner anticipated in Vision 2025. Alternatively it could explicitly slow down the growth of the sector by establishing a much more aggressive regulatory approach to the sector including the levying of a much more onerous tax burden. The latter would respond to the central criticism in *A Golden Opportunity* and similar critiques. That second approach might also generate some short term revenue gains for the state budget but would risk significant revenue losses in future years as investment levels in mining dried up or were even reversed. Or third, the government might seek some type of 'middle way' in which the more substantial anxieties of the critics will be addressed while the inherent liberality of the regulatory and tax regimes is retained. Many – but not all – of the specific recommendations in the Bomani Report are consistent with such a 'middle way'.

This paper attempts to provide an objective basis to help the government to examine this dilemma and so to reach sound decisions as it assesses the Bomani Committee Report and other suggestions for reform that have been presented recently. It is hoped above all this paper can help the government in its difficult decisions about the implied choice between ongoing high rates of mining sector growth versus a short-term approach of raising revenues at the risk of lowering sectoral growth in the future. The paper addresses these objectives by adopting a forward-looking approach and specifically:

- by identifying systematically the ways in which a modern mining sector can be expected to directly impact the economic situation of the country but

also those areas where its impact can at best only be indirect. This part of the analysis is not Tanzania specific. But it is critical in that it indicates what we can realistically expect of mining in the future and what certainly cannot be assumed about its impacts. But that analysis, by also pinpointing some of the inherent limitations of mining (as a vehicle to address national development needs), can also guide us to some aspects of government policies (beyond its mineral policies) that probably need to be strengthened in parallel if there are to be the large indirect pay-offs in future years to enhance the sector's credibility amongst the critics⁷;

- by examining the various dimensions in which mining's direct contribution to the broader Tanzanian economy might be expected to change beyond 2009 even under a regulatory and tax structure that was amended only modestly if at all. This part of the analysis recognizes explicitly that modern mining operations in Tanzania only really began some 10 years ago⁸, and that a much longer gestation period than this is needed to assess the sector's full economic and social impacts. This part of the analysis is preceded by a brief summary of the macroeconomic contributions of mining in Tanzania to-date; and,
- by discussing selectively just a few of the regulatory and other policy improvements that are desirable but that need not discourage the growth of the sector in the years to come: the elements of the 'middle way'.

This somewhat unusual approach does not dwell too much on things that have already happened in the past. Instead it focuses on how the established trends of mining's contribution to the economy since 1999 may reasonably be expected to evolve in future years. By proceeding in this way the paper hopes to spell out the 'big picture' regarding mining's role in the economy that has often been lost sight of as recent controversies have raged. It also seeks to stand aside from the confrontational approach to policy reform in this sector which has

⁶ United Republic of Tanzania, Report Of The Presidential Committee To Review And Advise Government On Management Of The Mineral Sector, Dar es Salaam, April 2008.

⁷ Some of these parallel policies get specific attention in the Bomani Report. But unfortunately they have been completely over-shadowed by the revenue issues in the subsequent debate and press coverage.

⁸ There was limited output from Resolute's Golden Pride mine late in 1998. Mining at the larger AGA Geita mine began in July 2000 and all the other large mines started significantly later than that.

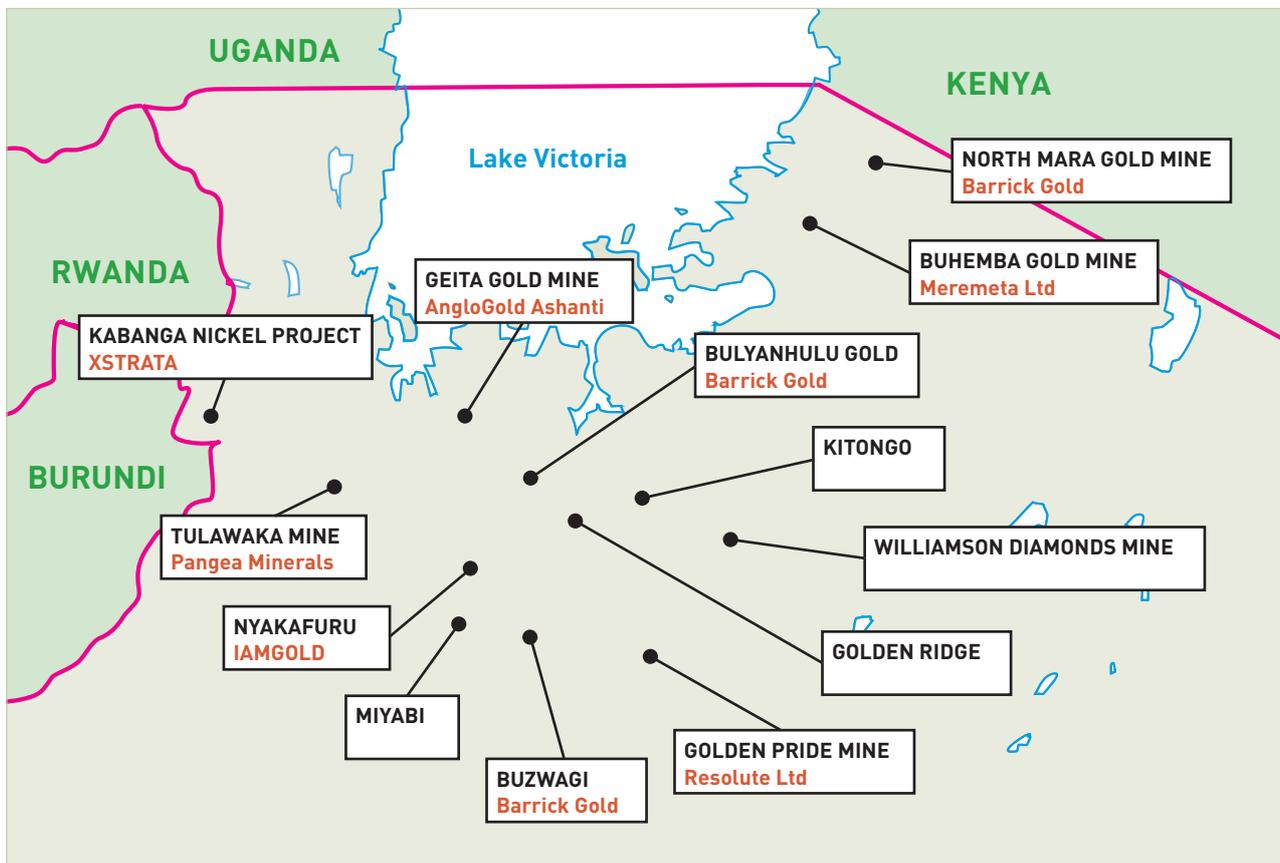
been far too prevalent in Tanzania in recent years. Instead it can help to:

1. Define the realistic expectations about the sector's role for the future in terms of its direct contribution to economic and social development and to government revenue;
2. Clarify what type of policy approach will be needed to sustain the impressive growth of the sector to-date; and,
3. Suggest a few of the other areas of reform including the creation of new partnerships that will be critical in maximizing the potential indirect pay-offs.

Armed with this information the authorities will hopefully be better placed to make the hard choices that now confront them.

The paper is presented in *five* further sections. Section 2 presents a stylized description of the various macroeconomic contributions that mining has been seen to make in countries similar to Tanzania. Section 3 documents the contributions that the mining sector can be said to have actually made to-date to the Tanzanian macroeconomic situation in the period 1999 – when the modern mining resurgence really began – to 2008. Later work under the REi hopes to extend this analysis to the micro and local levels⁹. Section 4 examines the 'life cycle profile' of mining operations by utilizing both the new direct evidence that we have collected from Tanzania and some supporting evidence from other countries some of which are more advanced in the mining life cycle than is Tanzania. Section 5 highlights three key conclusions that emerge from our life cycle analysis. Section 6 looks selectively at some of the policy issues that are informed by our analysis.

Figure 1.1: The main mines of Tanzania



⁹ It is noted that the local and micro issues considered in the Oxford Policy Management and ICMM 2005 case study for Tanzania were only limited to the North Mara mine.

Mining's Contribution in General

2



2. Mining's Contribution in General

Since the revision of the mining laws in 1998¹⁰, six major gold mines have begun operations in Tanzania. This is in addition to the mining for other minerals such as diamonds, some of which (such as the Williamson diamond mine) had been operating for many years¹¹. Box 1 provides the details including the original ownership of the six listed mines. After the Barrick acquisition of North Mara, two large foreign companies now dominate the field in gold mining. These are the Barrick Gold Corporation from Canada with the large mines at Bulyanhulu, North Mara and Tulawaka (with a 70% share through Pangea Goldfields); and AGA from South Africa which operates the country's largest gold deposit at the Geita mine. A third company Resolute operates the Golden Pride mine. In addition Barrick is developing the new mine at Buzwagi which began production in May 2009 also through Pangea Goldfields and IAMGold is in the advanced stages of exploration in Mwanza region. The operating mines together have rapidly changed the shape of the sector and have radically increased the volumes of its outputs and exports.

In assessing these contributions it is useful first to look at the general profile of what modern mining contributes to the macro-economy of any country based on the results of the four main REi case studies of 2004–2007 and other evidence. This is summarized schematically in Figure 2.1 where the numbers on the right hand side indicate the possible magnitudes of mining's contribution to the various macroeconomic impacts/effects shown in the triangle itself.

¹⁰ Specifically, the government made amendments to various financial Laws in 1997 (The Financial Laws (Miscellaneous Amendments) Act, 1997). These amendments were designed to attract foreign private sector investment into the mining sector. In 1998, the government then enacted a new Mining Law and made changes to the Foreign Exchange Act (1992) so as better to meet the needs of the mining sector. These changes have been largely retained during the past ten years.

¹¹ In earlier periods gold output which started on a commercial basis in Tanganyika in 1909 under German and then later British administrations, reached a peak output in 1938 at more than 100,000 ounces. In the last pre-War year, gold was exceeded only by sisal as Tanganyika's main export, earning almost £1m. But most of the gold mines became exhausted in the late 1960s and 1970s and gold production almost ceased in Tanzania in the early post-independence years, with only 84 ounces sold in 1975. However, some diamond mining continued and for several years diamonds at Williamsons remained as the most significant component in the mining sector.

Box 1: Contracts for new big gold mines since 1994

Bulyanhulu in Kahama

Owned by Bulyanhulu Gold Mine Limited (5 August 1994)
Operations began in 2001
Capacity 450,000 Ounces

Golden Pride in Nzega

Owned by Resolute Tanzania Limited (5 June 1997)
Capacity 200,000 Ounces
Some initial output from 1998

Geita Gold Mine in Geita

Owned by AngloGold Ashanti from South Africa
(24 June 1999)
Operations began in July 2000
Capacity 650,000 Ounces

North Mara in Tarime

Owned by North Mara Mine Limited (24 June 1999)
Operations began in 2003
Capacity 250,000 Ounces

Tulawaka in Biharamulo

Owned by Northern Mining and Pangea Minerals Ltd
(29 December 2003)
Operations began in 2005
Capacity 200,000 Ounces

Buzwagi in Kahama

Owned by Pangea Minerals Limited (17 February 2007)
Operations began in May 2009
Capacity 200,000 Ounces

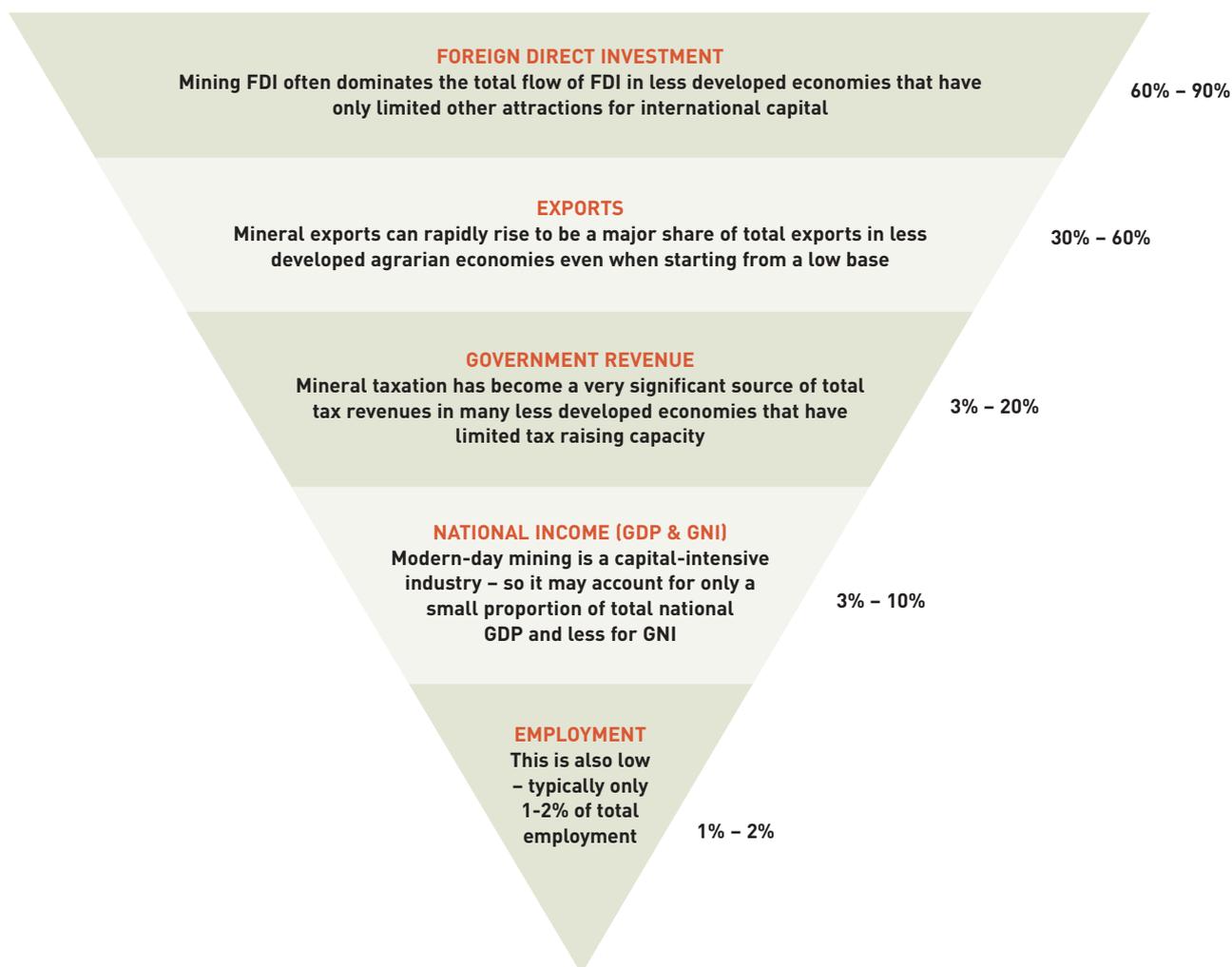
Source: Tanzania Chamber of Mines

A number of broad conclusions arise from examining Figure 2.1, including – reading from the top – the following:

1. Mining can readily become the main source of a country's Foreign Direct Investment (FDI)¹². If this happens (as is already the case in Tanzania) the volume of domestic investment is also likely to be significantly increased;
2. Mining can also become a major foreign exchange earner by generating new forms of exports. These new exports can easily (and quickly) supplant long-standing traditional exports in this role;

¹² It is now commonly accepted that foreign direct investment (FDI) has the potential to generate employment, raise productivity, transfer skills and technology, enhance exports and contribute to the long-term economic development of the world's developing countries. More than ever, countries at all levels of development seek to leverage FDI for development.

Figure 2.1: How big is mining's macro contribution? – A stylized view



3. Mining can often contribute a share of government revenues that is high relative to its share of GDP. This is because large scale mining is a visible and easily taxed activity compared with many more traditional activities including agriculture, the majority of small scale manufacturing and artisanal mining;

4. Mining in its more modern forms is unlikely to contribute a large proportion of a country's Gross Domestic Product (GDP). This is for the simple reason that it is a highly capital intensive activity. Its contribution to a country's Gross National Income (GNI) is likely to be even smaller because of the outflows of mining company dividends and interest in debt that represent part of the difference between GDP and GNI; and,

5. Modern mining cannot be expected to make a massive contribution to local employment levels. Again this is mainly because of the high capital intensity of the activity and less because of the choices as between expatriate and local employment as is often asserted.

In summary, when assessing the role of mining as one element in the long term development strategy of any country – not just Tanzania – the government of that country can envisage the various macro effects as the equivalent of an inverted pyramid such as that shown in Figure 2.1. There are very large and even dominant effects at one end of the spectrum but much smaller proportional effects at the other.

In particular, the government needs to weigh the very substantial advantages that the sector can bring (upper sections of the pyramid) in terms of additional foreign exchange earnings against the fact that the sector is unlikely to contribute so much directly to the solution of the country's employment problems. The government should not be surprised if the direct employment created by mining activity is relatively small (the lowest part of the pyramid)¹³. So if the government wants to generate a significant employment effect from the mining investments, then parallel policies beyond those applied to mining itself are called for: e.g. designating mining areas as poles of growth and using supportive policies to attract related manufacturing and service activities.

The government also needs to note that the mining sector's contribution to total GDP (middle of the pyramid) is likely to be smaller than its contribution to exports. But even so, there is no reason why a modern mining sector – because of its high visibility – cannot contribute to total government revenues in relative amounts that substantially exceed its contribution to GDP. This is because of the high visibility of mining and the relative ease of taxing either its production or its profits or both. But this fact then has to be weighed against the huge up-front investments (that create the other advantages shown on the pyramid). Given the structure of most mineral taxation systems this front-loading of investment creates large depreciation allowances that delay the large-scale receipt of revenues especially from any conventional corporation tax. So the revenue benefits must be seen in a medium or long-term context and not as something to be expected in the short term.

'If the government wants to generate a significant employment effect from the mining investments, then parallel policies beyond those applied to mining itself are called for.'

¹³ The country will get much more employment from artisanal mining but this activity will not provide the other large advantages shown on the higher sectors of the inverted pyramid. In addition this type of activity as Tanzania's own experience has shown has numerous environmental, health and safety problems attached to it as well as serious question marks about the *long-term* levels of possible employment that it can provide.

Outcomes to-date in Tanzania

3



3. Outcomes to-date in Tanzania

Our next task is to quickly review the macroeconomic impacts that the mining sector in Tanzania has achieved in the nine years approximately since the new regulatory basis for the sector was put in place. A similar and more detailed review was one key component of the earlier REi case study of Tanzania in 2006. So in this section we merely summarize and update the main parts of that earlier discussion. The analysis below follows the broad listing of different effects as shown in Figure 2.1.

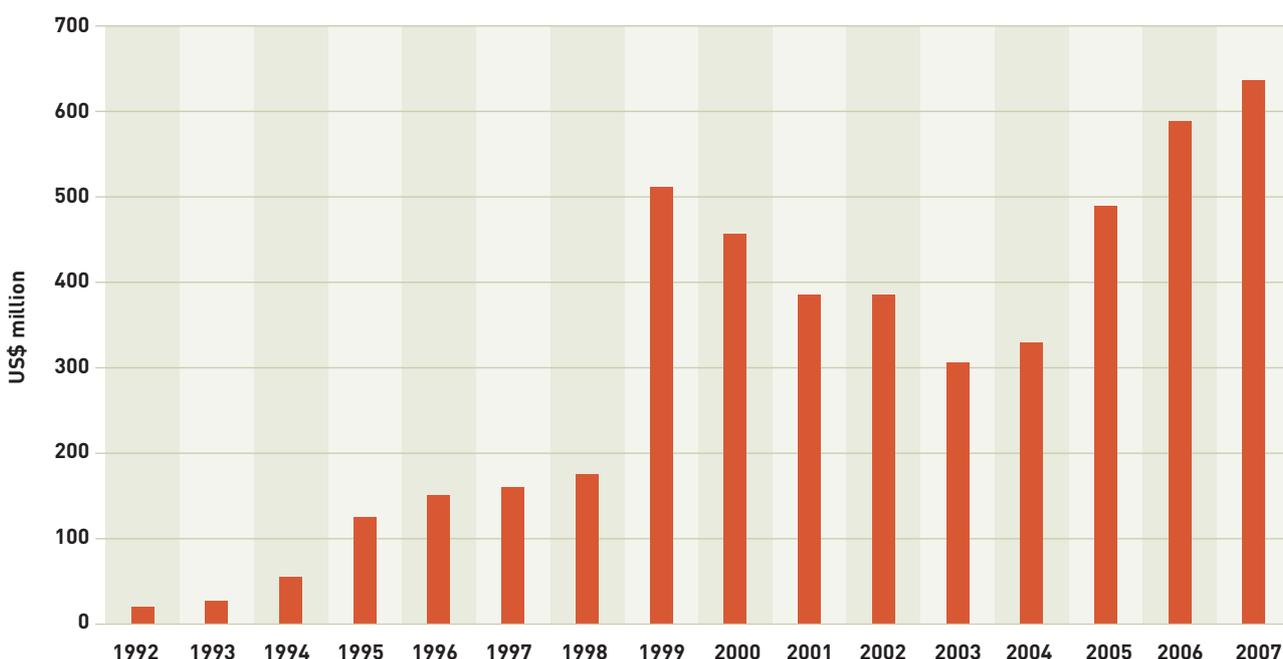
Foreign Direct Investment

As noted earlier, the increase in FDI receipts by Tanzania in the past decade has been truly remarkable. As UNCTAD’s latest 2008 *World Investment Report* shows, this increase has now placed Tanzania in the higher ranks of African economies. Those rankings are shown in Table 3.1. The results are surprising. With the exception of South Africa all the countries above Tanzania in the rankings are oil and gas exporting economies. Tanzania in the early 1990s would have appeared at

Table 3.1: FDI to African economies in 2007

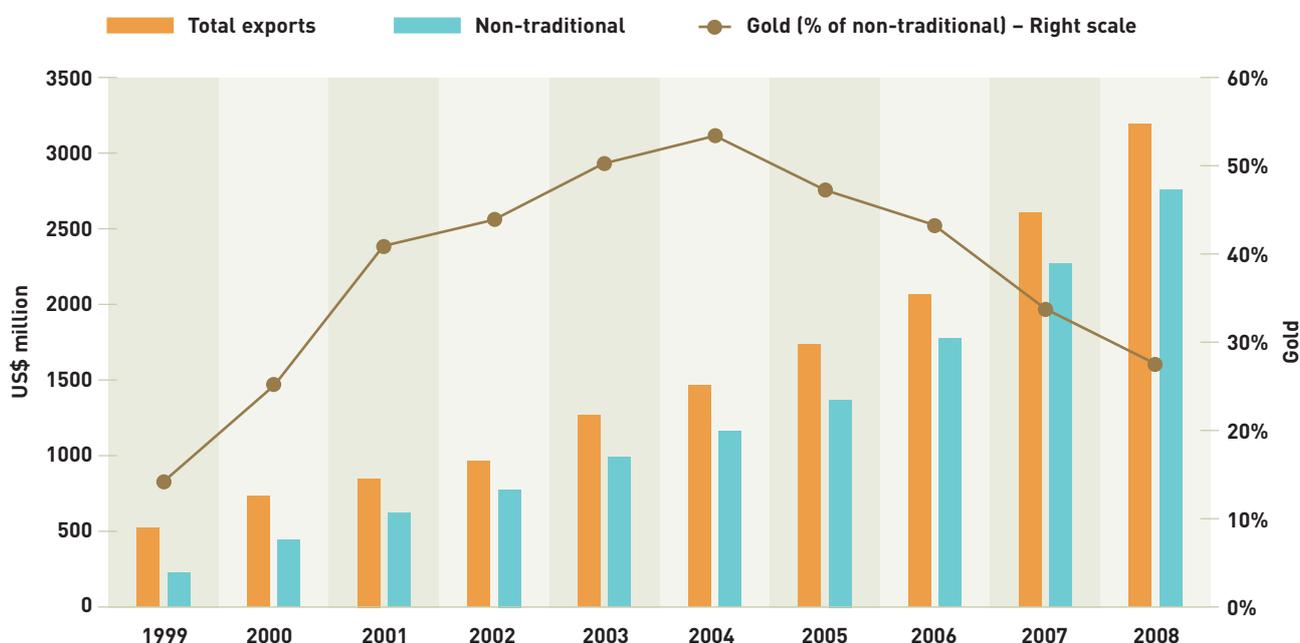
Range	Inflows
Over US\$3.0bn	Nigeria, Egypt and South Africa
US\$2.0bn to US\$2.9bn	Morocco, Libyan Arab Jamahiriya and Sudan
US\$1.0 to US\$1.9bn	Equatorial Guinea, Algeria and Tunisia
US\$0.5bn to US\$0.9bn	Madagascar, Zambia, Ghana, Kenya, Democratic Republic of Congo, Namibia, United Republic of Tanzania , Chad and Burkina Faso
US\$0.2bn to US\$0.4bn	Botswana, Mozambique, Côte d’Ivoire, Uganda, Mali, Congo, Mauritius, Cameroon, Gabon, Ethiopia and Seychelles
Less than US\$0.2bn	Djibouti, Cape Verde, Mauritania, Somalia, Guinea, Lesotho, Sierra Leone, Senegal, Togo, Zimbabwe, Rwanda, Gambia, Malawi, Benin, Liberia, Swaziland, São Tomé and Príncipe, Central African Republic, Niger, Guinea-Bissau, Comoros, Burundi, Eritrea and Angola

Figure 3.1: Tanzania foreign direct investment 1992 to 2007 (US\$ million)



Source: IMF, International Financial Statistics

Figure 3.2: Export earnings 1999 to 2008 (US\$ million)



the very base of this ranking. Now it is above or on a par with countries such as Botswana, Mauritius and Kenya that at one time would have significantly out-paced Tanzania as a location for new foreign investment¹⁴.

Furthermore, the major single reason for Tanzania's sustained high performance in recent years has been the massive new inflows of capital for investment in the mining sector. Since 2000 UNCTAD data tell us that the overall stock of FDI in Tanzania has risen from US\$2.78bn to US\$5.94bn and we know that more than US\$2bn of this overall increase is attributable to mining investments. By contrast the UNCTAD data shows that the share of infrastructure investments (electricity, water) was only 6% of the FDI total stock. In terms of overall flows of FDI, Figure 3.1 shows the growth of FDI into Tanzania in all recent years from 1992. The acceleration associated with the new phase of mining investments after 1998 is very evident.

Exports

There has been a similar radical transformation of the structure of Tanzanian exports in the decade

under review. In 1999, well over half of Tanzania's export earnings were generated by the traditional agricultural products such as coffee, tea, cashew and tobacco with an ongoing smaller contribution from the former major earner of sisal. This dependency continued the pattern that had been seen since well before Tanzania's independence in 1961. However, by 2005 the share of traditional agricultural commodities in total exports had fallen to only 20% and by 2008 that share has reduced further to less than 14%.

Figure 3.2 confirms that the very significant growth of total exports seen since 1999 is almost wholly accounted for by the growth of the non-traditional export sectors within which mining products and manufactures are the major elements. Specifically, the earnings from non-traditional products rose from US\$240m in 1999 to an estimated US\$2,800m by 2008: a compound rate of growth of 31% per annum. In that same period the earnings from traditional crop exports rose from US\$301m to an estimated US\$430m with declines in dollar terms in some intermediate years. The overall compound growth rate for this traditional source of foreign exchange earnings was only about 4% over the full ten year period.

¹⁴ In some country cases such as Kenya the relatively high ranking in 2007 is largely associated with the sale of existing assets such as telecommunications to foreign investors: over an extended series of years Tanzania out-ranks Kenya more decisively than in 2007.

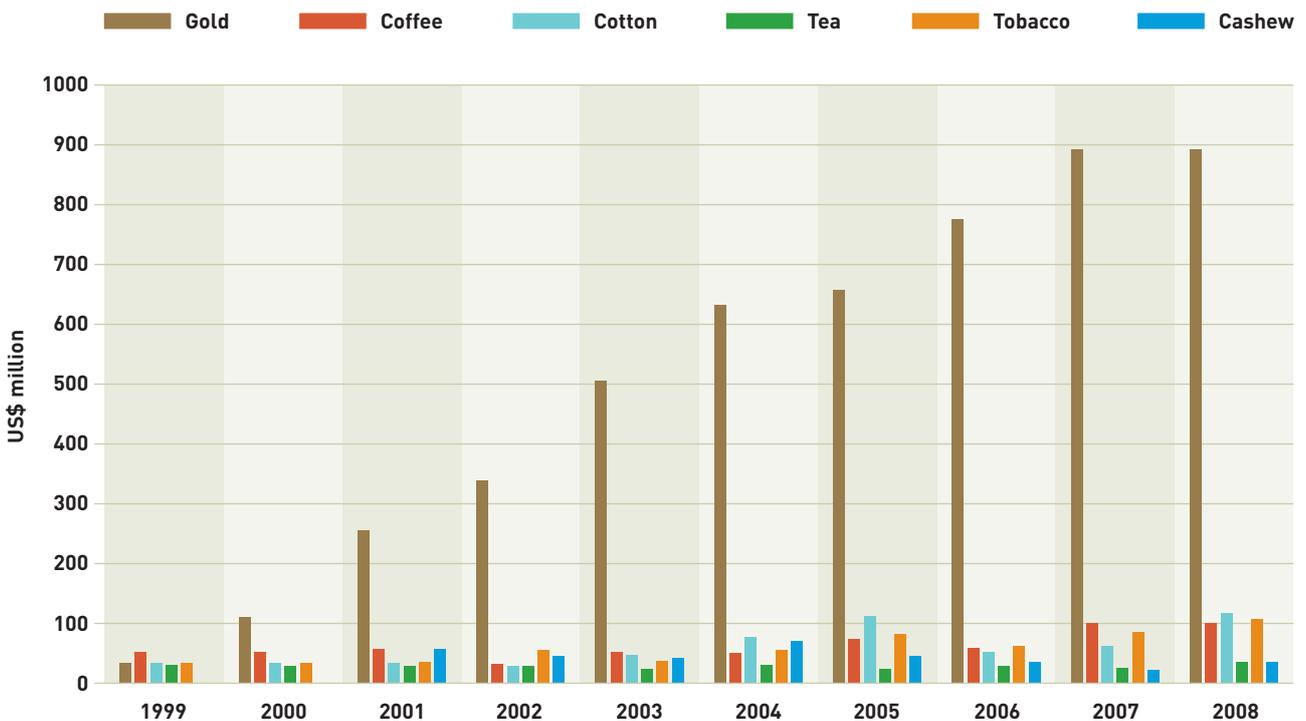
Gold mining exports have easily been the most dynamic components within non-traditional exports. Over this period they have out grown all manufacturing exports combined by a factor of 8:1 in the peak in 2004 and by a factor that is still around 2:1 currently. The right axis of Figure 3.2 shows that the share of gold mining exports in total non-traditional exports rose from only 10% in 1999 to more than 53% in the peak year of 2004. These gold exports have been an absolutely crucial element in achieving the impressive outcomes for non-traditional exports as a whole seen in the past decade¹⁵.

Figure 3.3 shows how rapidly gold exports have out-distanced the traditional agricultural export crops that for so many years were the leading foreign exchange earners for the country.

The contribution of gold mining to foreign exchange earnings can also be viewed from a counterfactual perspective:

- *In the absence of its relatively recent earnings from gold mining, Tanzania would be foregoing around US\$750m per annum of foreign exchange earnings. By comparison, this amount is larger by some margin than the net debt relief that Tanzania has received in any recent year, even the years of greatest debt relief. It is also about 700% higher than the earnings from Tanzania's main traditional export of coffee in most recent years (circa US\$100m). Of course there are large imports associated with mining especially in the import-intensive construction phases of any new mine. These need to be deducted from exports in order to get a true picture of the sector's overall contribution to the balance of payments. However, that must be done as a part of the life cycle analysis of mining operations to which we turn later since the import amounts are so hugely variable over that cycle (see Section 4).*

Figure 3.3: Gold and the traditional export crops 1999 to 2008 (US\$ million)



¹⁵ Based on recent performance the addition of diamond and other mineral exports would add a further 10% approximately to the numbers shown for mining in Figure 3.2.

Table 3.2: Sector shares of GDP (% current prices, 1998 to 2007)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Mining	1.4	1.4	1.5	1.8	2.1	2.4	2.6	2.9	3.2	3.5
Total GDP	100.0									
Monetary GDP	83.1	83.7	83.9	83.9	84.2	84.4	83.6	84.1	84.5	84.8
All agriculture (Monetary)	18.3	18.7	18.2	17.7	17.5	17.4	17.2	16.2	15.3	15.1
Crop husbandry	13.7	13.8	13.0	12.7	12.7	12.6	12.5	11.5	10.6	10.7
Other agriculture	4.5	5.0	5.2	5.1	4.8	4.8	4.7	4.7	4.6	4.3
All industry, mining and construction	17.5	17.3	16.9	17.0	18.7	20.1	19.9	19.7	19.6	19.9
Manufacturing	9.7	9.1	8.8	8.4	8.3	8.3	8.1	7.9	7.8	7.8
Other industry and construction	6.4	6.8	6.7	6.9	8.3	9.5	9.3	8.9	8.6	8.6
Services	40.2	41.2	41.6	41.7	40.5	39.3	38.8	39.1	40.0	40.2

Gross domestic product and growth

The rapid growth of mining activity over the past ten years has increased the sector's overall contribution to the *level* of the country's total GDP. However, as noted earlier, the high capital intensity of modern mining means that the magnitude of this impact is nowhere near as large as the sector's impact on investment and on exports.

The data that summarize the evolving share of the mining sector are presented in Table 3.2.

The shares of the various sectors of productive activity shown in Table 3.2 have been surprisingly stable over the eleven year period (1998 to 2007). However, the share of total GDP attributable to mining has risen clearly and consistently if only by a small *absolute* amount. Coincidentally the magnitude of that increase (2.1% of GDP cumulatively since 1998) is almost equal to the cumulative decline that has been seen over that same period in the GDP share of *manufacturing*.

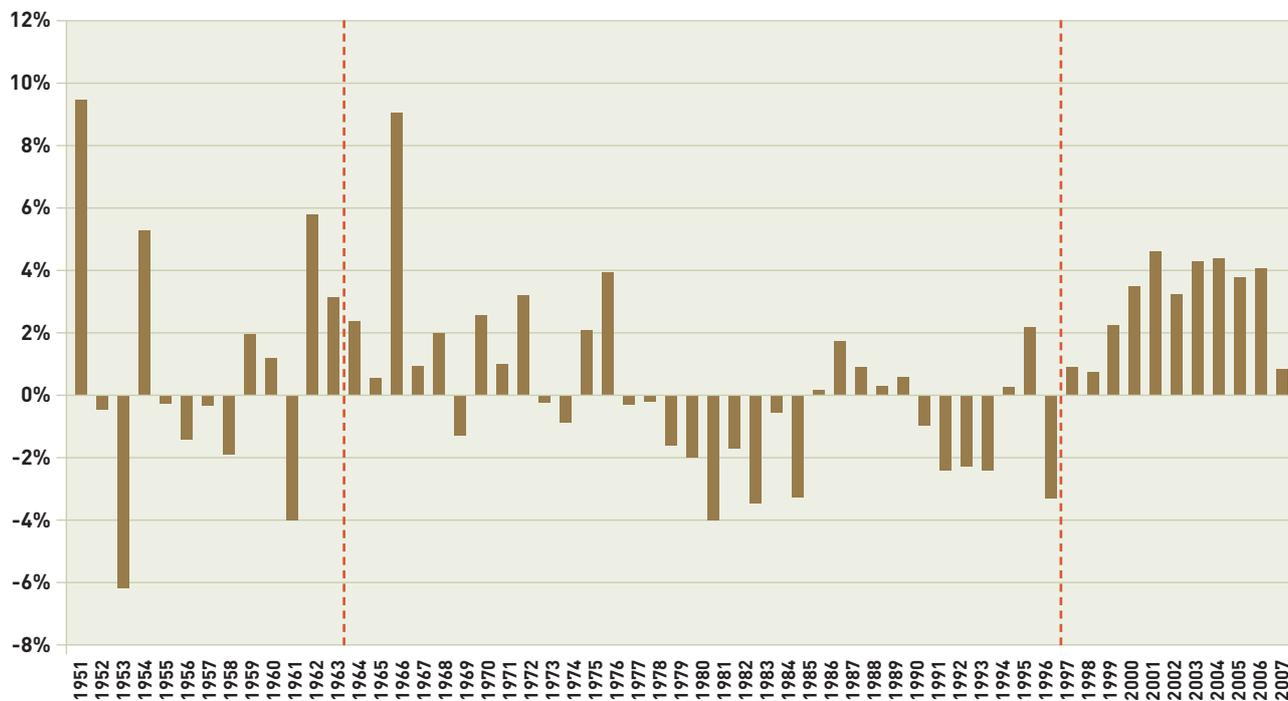
The share of the country's mainstream *crop agriculture* has also declined over the same period and is now only a little more than 10% of the total. The only other major movement of real note is the gradual increase in the share of *construction* from 4.4% of total GDP in 1998 to 6.7% in 2007. This sector together with mining are the only ones showing growth rates consistently higher than the overall GDP average rate of growth since 1998. *Hence in statistical terms, these two sectors together represent much of the source of the dynamic for the overall growth that the period has witnessed*¹⁶.

As regards the growth of GDP as a whole there is little question that the Tanzanian experience since 1998 has represented a radical improvement compared with what had been achieved previously in both the colonial and the post-colonial periods. This is evident from the growth rate data shown in Figure 3.4 and based on the very long time-series from 1950 compiled by Angus Maddison and his team at the University of Groningen¹⁷.

¹⁶ This conclusion is partly influenced by the level of aggregation used in Table 3.2. But it is significant that none of the component parts of the large Services sector have seen gains in GDP shares as large as those seen for mining and construction. Even the telecommunications sector has only achieved a 1.2% increase in share in the eleven years and public administration has gained the same 1.2%.

¹⁷ Figure 3.4 uses the Maddison data for the years 1950 through 2005 and then more recent data from the IMF for the years 2006 and 2007.

Figure 3.4: Growth rates of GDP per capita 1951 to 2007

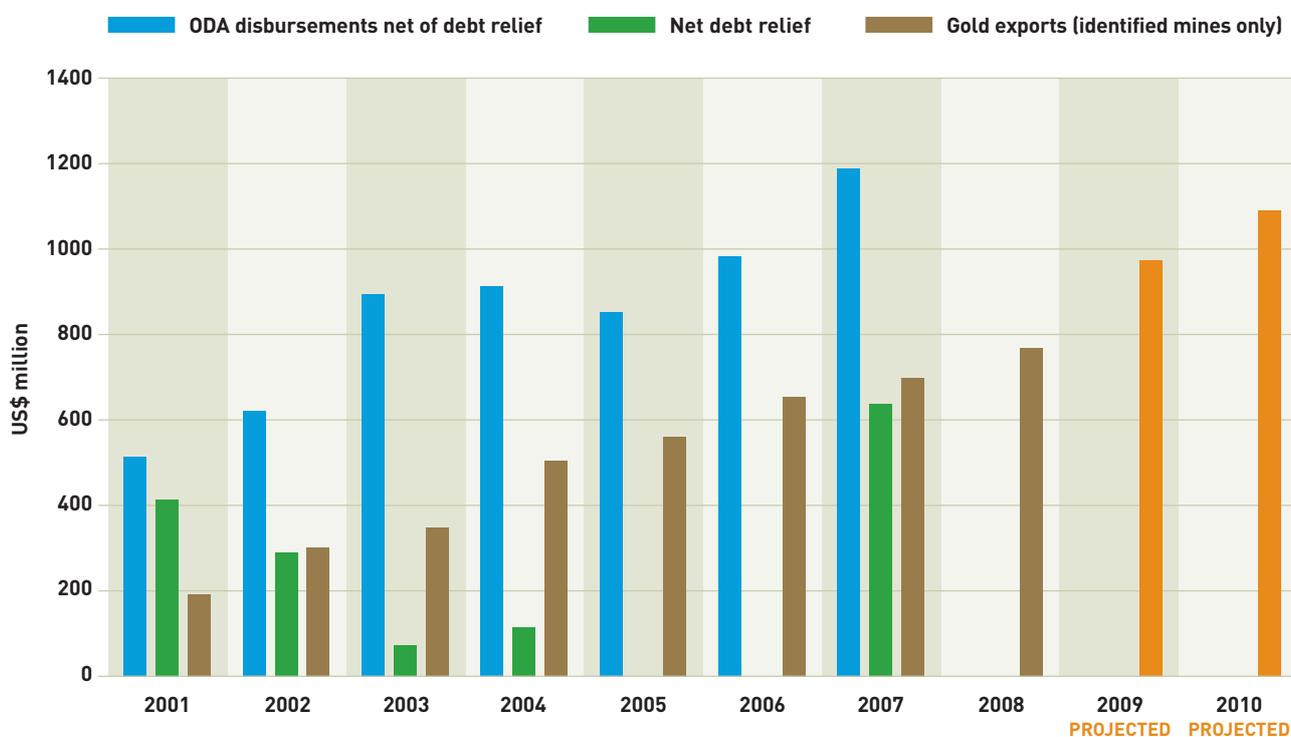


The red, dashed, vertical line on the left of Figure 3.4 indicates the founding date of the unified sovereign nation of Tanzania in 1964. It can be clearly seen that the rates of per capita GDP growth in the years before and the years after that date manifested huge instabilities. There were certainly a few good years immediately after Independence but these were followed all too rapidly by declines in average living standards and then by the chronic instabilities of the late 1970s and the 1980s when living standards as measured by GDP per capita declined on a sustained basis. The second red, dashed, vertical line which is further to the right on Figure 3.4 indicates the approximate date by which the Mkapa reforms had fed through to stimulate the new private sector-dependent activities of the economy including above all those in the mining sector. It can readily be seen from the graphic that the years after that date in the late 1990s have been more stable and also more successful, in terms of the sustained rise in average living standards, than any other ten year period during that 57 year period for which the Maddison data are available.

Of course one cannot present the new mining investments seen since 1998 as the single cause of the relatively successful economic record since then: many components of the government's economic policies have worked well together to achieve that encouraging outcome¹⁸. But the achievements of the mining sector certainly can be presented as one symptomatic manifestation of the successes the government has achieved in relation to higher economic growth.

¹⁸ We have not engaged in this report with some of the common criticisms of mining based on the so-called Resource Curse propositions. However, the evidence thus far is that Tanzania has largely avoided the main manifestations of such a curse. Further details are in earlier REI reports including the Tanzanian case study. See www.icmm.com

Figure 3.5: Tanzania: Aid, debt relief and gold exports (US\$ million)



Source: OECD DAC

The contribution of gold mining to foreign exchange earnings can also be viewed from a counterfactual perspective. In the absence of its relatively recent earnings from gold mining, Tanzania would currently be foregoing around US\$750m per annum of foreign exchange earnings. As is shown in Figure 3.5, this amount is still increasing beyond 2008 (according to the projections from the identified mines). It is also of a similar order of magnitude to the total of all the bilateral and multilateral aid flows to Tanzania in many of the most recent years. It is considerably larger than the debt relief enjoyed by Tanzania in all the years shown in Figure 3.5, and about 700% higher than the earnings from Tanzania's main traditional export of coffee in most recent years (circa US\$100m). Of course there are large imports associated with mining especially in the import-intensive construction phases of any new mine. These need to be deducted from exports in order to get a true picture of the sector's overall contribution to the balance of payments. That adjustment is best done as a part of the life cycle analysis of mining operations to which we turn later since the import amounts are so hugely variable over that cycle (see Section 4).

Government revenues

The mining sector's contribution to government revenues is the most difficult of the various macro effects to pin down statistically. Partly for this reason it is also the most controversial. As the World Bank pointed out in March 2009 when announcing Tanzania's recent decision to participate in the Extractive Industries Transparency Initiative (EITI), 'While information on mining revenues is currently available for instance through the government budget, it is not easily identifiable nor is it reconciled, by an independent third party, with what the companies paid to government'¹⁹. This is a problem that will be resolved convincingly by Tanzania's participation in the EITI. In the meantime we are forced to rely on some rather patchy data.

Data from the Oxford Policy Management and ICMM 2005 case study for Tanzania (which only looked at the local and micro issues in regard to the North Mara mine) is reproduced as Table 3.3. This is based on data from the Ministry of Finance (MoF). It can be seen that the starting point in 1998

¹⁹ World Bank web site March 16, 2009.

was one in which the sector was generating almost no revenue whatsoever for the government. However, five years later and by the time of the 2003/04 budget the MoF was able to anticipate revenues of around US\$40m from the sector. These were still relatively small amounts but nonetheless amounted to some 3.7% of total tax revenues *even at that very early stage*. The cumulative receipts from mining through to the 2004/05 budget year as highlighted in Table 3.3 amounted to US\$177.8m.

At the time of writing we do not have the more recent comparable MoF data. However, the detective work undertaken by the authors of the *Golden Opportunity* report provides a reasonable basis for updating the earlier MoF data. Specifically, the information that the authors record

from the Commissioner of Minerals for the period 1998–2006 shows cumulative mineral tax receipts for that period of US\$259m²⁰. This represents an increase of a further US\$80m over the total to the end of the 2004/05 budget year as deduced from Table 3.3. This amount is also consistent with the steady annual increases in mineral revenues in dollar terms as shown in Table 3.3²¹. A second data source cited by the *Golden Opportunity* report is UNCTAD's 2007 *World Investment Report*. That report records cumulative mining sector tax payments totaling US\$252m but this covers the shorter period of 1999–2005. The two sources together seem to confirm that by 2006 mineral revenues were well in excess of US\$50m per annum and heading towards a number somewhere nearer to US\$80m per annum.

Table 3.3: Government revenues including from the mining sector (1997/98 to 2004/05)

	1997/98 Actual	1998/99 Actual	1999/00 Actual	2000/01 Actual	2001/02 Actual	2002/03 Actual	2003/04 Budget	2004/05 Projected
Total revenues	856	974	1,262	1,411	1,626	2,105	2,607	3,348
Domestic revenue	619	689	778	930	1,043	1,218	1,393	1,572
Program loan and grants	82	106	128	154	216	282	405	435
Project loans and grants	174	164	340	251	294	568	668	858
HIPC interim relief multilateral	-	-	11	56	60	73	103	75
Other	(19)	15	5	20	13	(36)	38	241
Mining revenues in US\$m	2.2	2.2	4.9	18.9	24.4	34.4	44.3	46.5
Exchange rate	612	665	745	800	876	967	1038	1089
Mining revenues (Tzs billion)	0.0	1.4	3.6	15.2	21.4	33.3	46.0	50.6
% of domestic revenues	0.0%	0.21%	0.47%	1.63%	2.05%	2.73%	3.30%	3.22%
% of domestic tax revenue	0.0%	0.2%	0.5%	1.8%	2.3%	3.0%	3.7%	3.6%

²⁰ This is in Table 1 of the Report on page 18.

²¹ The final column of Table 1 in the *Golden Opportunity* report shows annual Government Revenues as the simple average over the period covered by their various sources (e.g. US\$28.7m in the case of the data from the Commissioner for Mines). This of course is somewhat misleading given the clear annual upward trend that is evident in the data.

Further guidance on this comes from the reports of the two major gold mining companies namely Barrick (three mines) and AGA (the Geita mine). The *Golden Opportunity* report provides data for the four large mines already operated by the gold mining component of the sector. The data provided for the Barrick mines records the data only for

groups of years (e.g. 2001–2005). However, using these data totals and on the basis of two alternative assumptions (1) conservative (as shown in Figure 3.6) and (2) more realistic (as shown in Figure 3.7), it is possible to provide the alternative graphical summaries of the evolution of gold mining taxes paid to the government.

Figure 3.6: Taxes paid by four mines in Tanzania (US\$ million) – Conservative assumptions

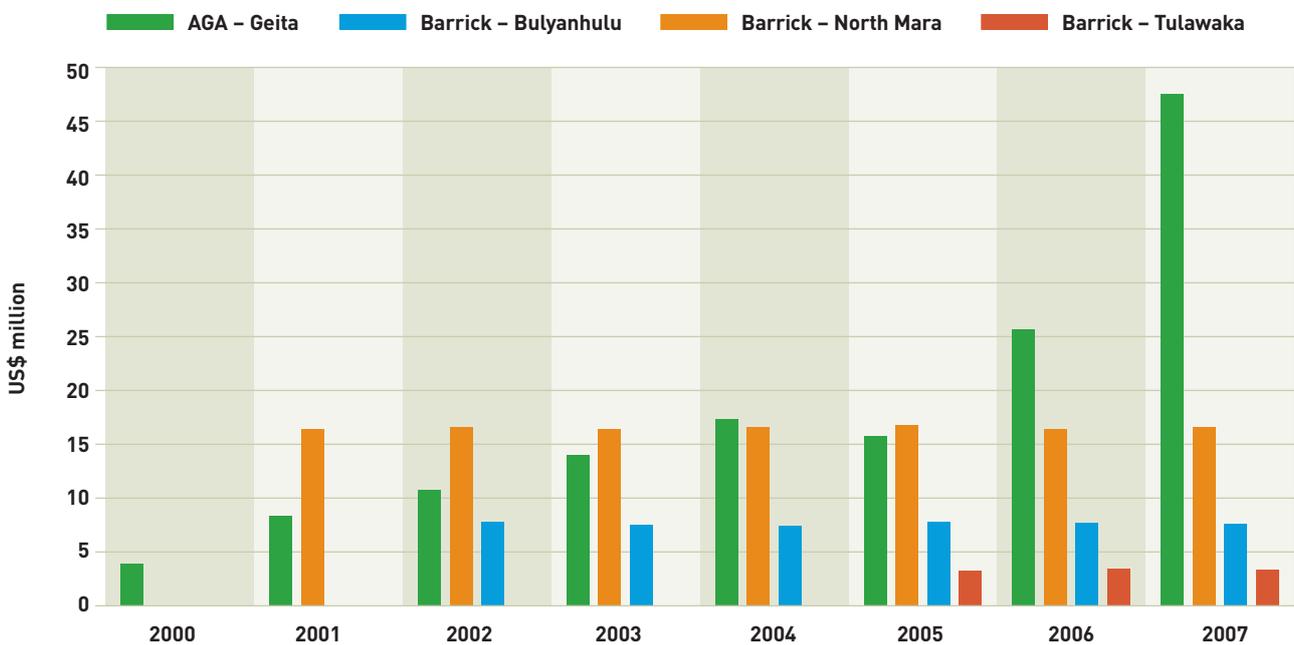
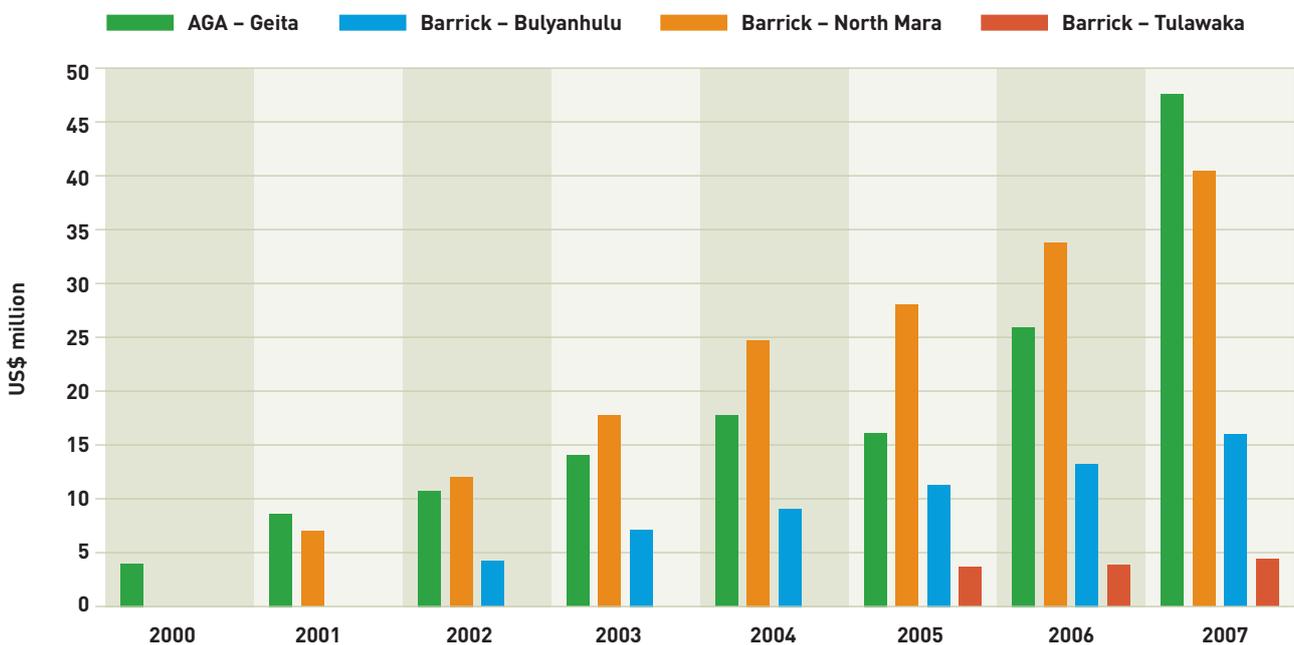


Figure 3.7: Taxes paid by four mines in Tanzania (US\$ million) – More realistic assumptions



If we use the more conservative of the two assumptions²², then total revenues from these four mines had grown to US\$76m per annum by 2007. If we adopt somewhat more realistic assumptions then the revenue total from the four mines alone amounted to about US\$100m per annum by that date.

Once again no one can claim that these numbers are huge relative to, say, the export earnings of mining of over US\$750m by 2007 but neither are they trivial²³. The latest IMF Report on Tanzania indicated that the government's actual tax revenues in 2006/07 amounted to Tzs 2,529bn which is the equivalent of US\$2,486m. On this basis even the four gold mines alone account for the equivalent of between 3.1% and 4.3% of the total tax revenues achieved by the government. This is the equivalent of about one third of all the government's receipts from all import duties; more than the actual receipts from HIPC debt relief in the last years when this was provided, and about the same as the level of annual receipts from MRDI debt relief in recent years. *These two mining companies were also already among the largest single taxpayers in the country – and this is happening before the effect of the long periods of depreciation relief are exhausted.*

Summary

This quick update of the various contributions that mining has made at the macro level of Tanzania's economy has largely confirmed the conceptual pattern indicated by the inverted pyramid of effects as shown in Figure 2.1. During its relatively short period of existence the new mining industry of Tanzania has had a huge impact on Tanzania's ability to attract new *investment from abroad*: it is easily the dominant industry from this point of view. It has also made a visibly very large contribution to the transformation of the country's *export earnings* away from the 50+ years of dependence on the traditional agricultural industries of coffee, tea, cashew, tobacco and sisal. It now provides more than US\$750m of valuable foreign exchange earnings to the country – critical for the importation of goods and services for consumption and investment. It has also managed to provide a consistently increasing *contribution to the country's GDP*. Together with the construction sector mining is one of very few sectors that have increased their share of total GDP in the past decade. The sector's contributions to total *tax revenues* have also shown significant increases. These increases have meant that even before the effects of the long-lived depreciation allowances unwind, the sector has been able to contribute a share of total government tax revenues that is almost commensurate with its share of total productive activity. Even in its infancy the sector can already claim to be a major tax payer.

²² This assumption uses the *Golden Opportunity* Table 3 data for Barrick and allocates this across the years involved using a simple average. This of course is unrealistically conservative insofar as the Barrick profile of payments to the government is following the same rising trend as does that of AGA as shown in Table 2 in the same report. The more realistic assumption uses the same totals for the periods shown by *Golden Opportunity* in their Table 3 and allocates these on a rising trend over time. For 2006 and 2007 (where no data are available for Barrick we assume a 20% per annum increase – much slower than that shown for AGA in Table 2 of the *Golden Opportunity* report.

²³ As UNCTAD's 2007 *World Investment Report* notes, ... 'Low taxes and royalty payments as a share of export revenues are not the same as low shares in mining profits. The latter are the difference between total revenues and costs and may be low in the early years of mining projects as firms try to recover their fixed costs. It often takes time for an extractive industry project to generate significant government revenues. This is partly because most countries offer accelerated depreciation and other incentives to investors to allow them to recover, over a period of time, the significant cost outlays involved in such projects so as to reduce risk and encourage investments. Thus tax payments may not become due until several years after a project begins to generate export revenues'. (page 137)

What can we now expect?

4



4. What can we now expect?

The analysis of the previous sections has relied in large part on historical data. However, it is not sufficient to base judgments, let alone future policy decisions for mining, on such data alone and for two main reasons.

- First, the historical data merely relate to the effects of government's policies towards the sector as they have been manifested to-date. But we know that those same policies since 1998 have already encouraged a significant amount of new mineral exploration and have already and will in future help to encourage a number of new mining investments that should further increase the various macroeconomic effects that have been analyzed above.
- Second, even in relation to the investments that have been made prior to 2009, there are further effects to come as the long gestation periods work themselves out. The most important of these relates to the further gains in budgetary revenues that are likely to follow from higher production levels combined with the gradual unwinding of the long periods of depreciation that are allowed for the purposes of calculating corporation tax liabilities. But another relates to the gestation period involved in developing the local supply chains that can be expected to emerge in response to the high levels of final and intermediate product-purchases made by the companies. A third relates to the immutable reality that all the present mines in operation in Tanzania will eventually need to close.

In short the task of assessing mining's contribution to the economy needs to be treated as an ongoing task of measurement and monitoring and not as a one-off snapshot at a single point in time.

In designing the research work to underpin this present paper, the authors at Oxford Policy Management approached *four* of the mining companies currently operating in Tanzania (AGA, Barrick, Resolute and IAMGold). Each of those companies was requested to provide the research team with structured information about several main aspects of both their historical and the future levels of their operations under headings such as production levels, employment, new capital investment, tax payments, and community

contributions. The Template used for collecting the data is reproduced as Appendix A to this present paper.

The work of intermediating the collection of these data was carried out by an independent 'aggregator' identified by the World Gold Council. That person – Maureen Upton – was required further to ensure that the researchers received only *aggregate* information across the four companies and that the commercial confidentiality of the information that was supplied was thereby preserved.

At the time of drafting this present paper the authors at Oxford Policy Management have received the aggregated data for *three* of the four companies and for the *five* mines that they presently operate or plan to operate shortly. Data were received in time covering four main operating mines (North Mara, Bulyanhulu, Geita, Tulawaka) plus two new mines (one operated by IAMGold and the Buzwagi mine operated by Barrick) for which expected production data was included) and the period 1995 through 2034 – almost *forty* years of data.

The data provided spans the period from 2000 through 2034. However, the data available are not entirely complete and so *the analysis that follows must be regarded as work-in-progress and subject to future revisions.*

Oxford Policy Management have sought to supplement the results from the survey by juxtaposing the core data from the three responding companies with supplementary but partial data about other mines and other companies. The work relates predominantly to the gold mining sector but some small elements of the data relate to other minerals. Since the Tanzanian data is not as complete as would have been ideal, selective data from other countries experiences has been used to throw further light on the likely 'life cycle' patterns of mining that may be expected.

The results of this forward looking analysis are presented under four headings below namely:

- A. Production
- B. Balance of Payments
- C. Government Revenue
- D. Employment

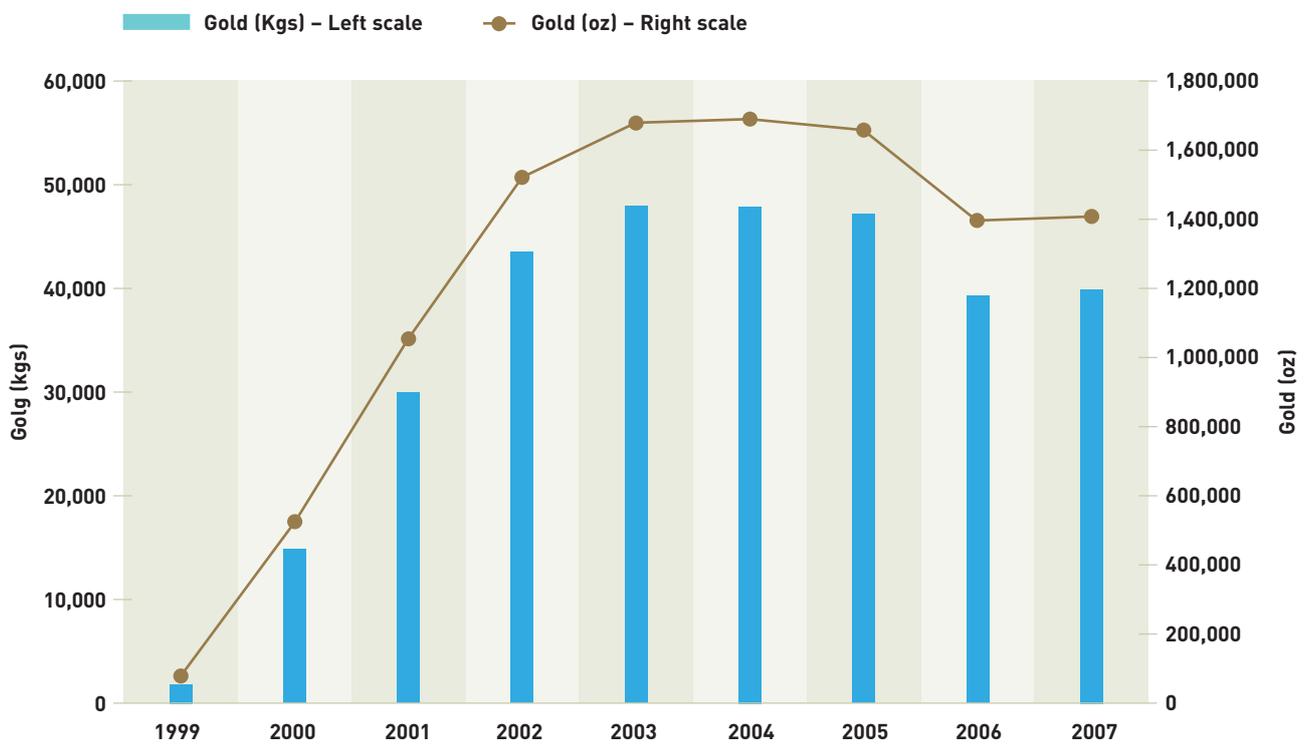
A. Production levels

Since the first of the new modern mines began to operate at the end of the 1990s we know there has been a rapid growth of physical output. This growth record is summarized graphically for the gold mining sector in Figure 4.1. Production in the sector as a whole increased from less than 2,000 kg in 1999 (70,000 ounces) to well over 47,000 kg (1.7m ounces) by 2005 before declining slightly in the next two years to 2007. This level of realized production can be compared with the proven reserves in the six major mines listed in Box 1 which amounts to a total of almost 40m ounces. *So the capacity of those six mines alone provides for production at the 2007 levels for some 20 or more years!*

The production trends shown in Figure 4.1 have of course provided the basis for the various macroeconomic impacts that we described in Section 3. But what will happen next?

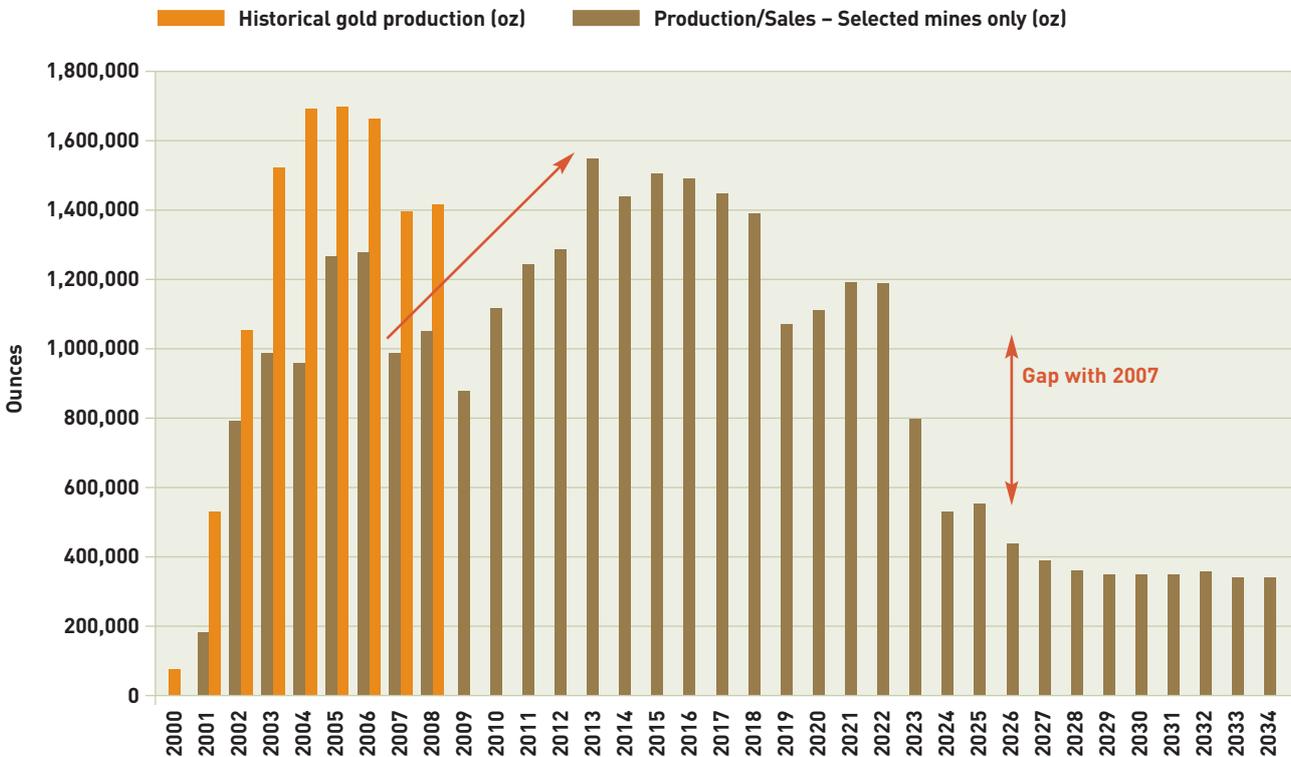
Based on the data provided by the three companies, and the activities of their operational mines, there is likely to be a further growth of production beyond the levels shown in Figure 4.1. These further increases will persist until around 2013–2014 when output levels from these mines collectively will begin to decline. This decline will accelerate faster between 2020 and 2025 when three of the four mines are likely to reach the end of their natural lives (North Mara, Geita and Tulawaka). Output from the four mines will dip below the 1m ounces level in about 2022.

Figure 4.1: Production levels of gold 1999 to 2007



Source: Bank of Tanzania

Figure 4.2: Gold production to 2034 – Selected mines



If we juxtapose the likely production levels from the five specified mines on to the aggregate production data for the historical period to 2007 as already shown we get the picture presented in Figure 4.2.

The *life cycle* pattern of production from the identified mines is quite clear from this graphic. Specifically, there is a further boost to production to anticipate through 2014 (a further 44% increase relative to the 2007 level – as shown by the arrow) but then there starts to be a significant decline as the reserves of the mines are gradually exhausted. So a first result of this analysis is to show there is a large gap that emerges some 10–12 years from now *if the authorities want to receive the same contributions from gold mining as in the recent past.*

The partial data available to us does not permit any reliable calculation of the *total* sector wide production volumes that are likely in future years. However, if total production could be expected to follow the pattern indicated by the identified mines then the peak level of production by 2014 would be a little over 2m ounces as compared with 1.4m ounces in 2007. Thereafter production levels would tail down to only about 0.5m ounces by around 2025. But this is *not* a forecast – *the actual outcome will depend on the new discoveries of the next few years and the strength of the incentives to convert these discoveries into new output!*

B. Balance of Payments

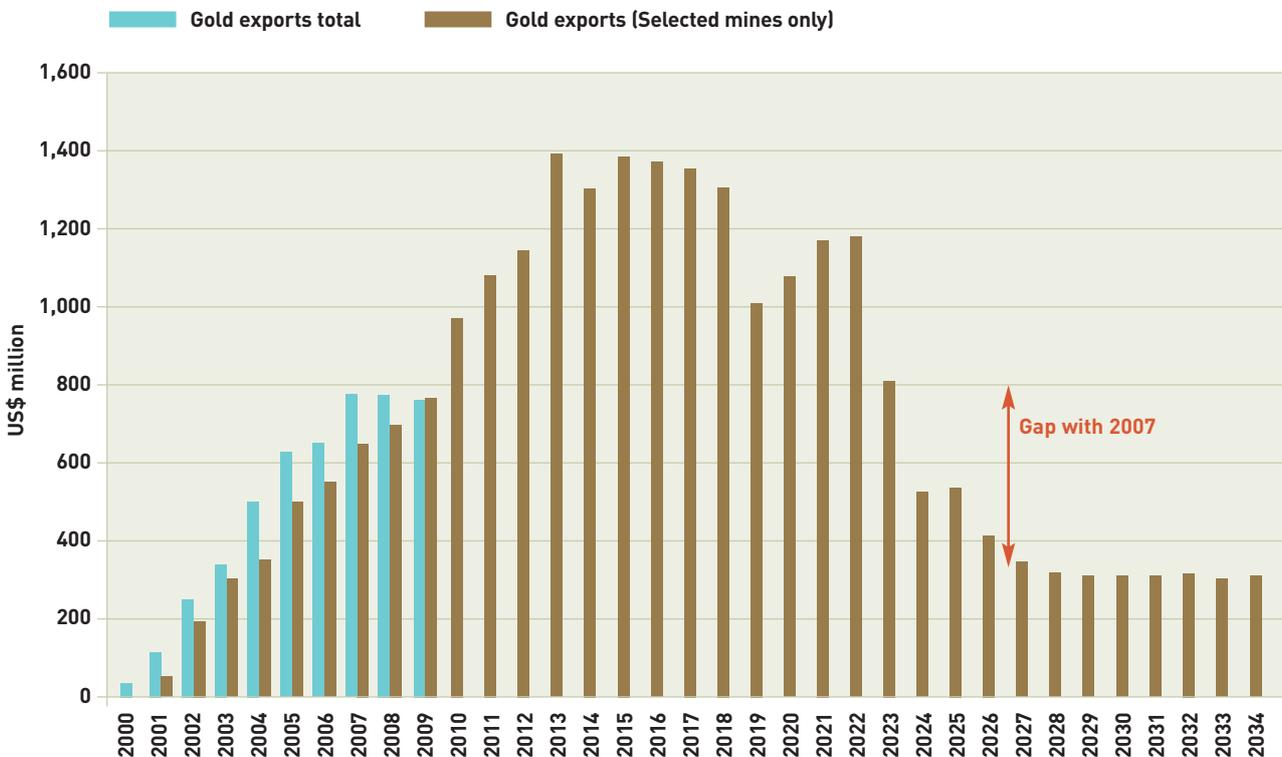
In examining the Balance of Payments (BoP) effects of mining, we concentrate first on the export earnings from the sale of gold. It is evident from the earlier analysis that this has been one of the most dynamic and significant of the macroeconomic effects so far. The data of the period through 2008 is repeated as the first block of data on the diagram of Figure 4.3. But also juxtaposed on to that same Figure 4.3 are the estimated future exports earnings from the five identified mines.

Once again we can see there is a significant further rise in export earnings from gold expected in the years ahead. The present export earnings from gold of somewhat more than US\$700m (US\$770m for all of mining) seem likely to rise to almost double that value to reach a total of around US\$1.4bn in the period 2012 to 2016. Thereafter

there is likely to be a significant decline so that by 2023 export earnings from gold will be lower from these identified mines than has been the case in the recent past. The amount will decline further and will be less than US\$400m by about 2027.

It should be emphasized that these numbers utilize the assumptions about the export price of gold that has been employed by the three companies who responded to our survey. The numbers therefore encapsulate potentially different views about the future of the gold price²⁴. They also encapsulate the differing policies of the three companies about arranging price-hedges for their future gold sales. We know in at least one company case that the realized export price in recent years has been *below* the prevailing world price. In short the export earnings numbers for the future years are subject to a number of imponderables regarding the movement of the gold price.

Figure 4.3: Export earnings from gold through 2034 (US\$ million)



²⁴ It is stressed once more that since we the researchers had no access to the data of individual companies we are unable to comment with any authority on the price assumptions they have individually made.

To obtain a more complete picture about the current account of the Balance of Payments (BoP) we need to assess the export earnings alongside the following additional components of the current account namely:

- Import purchases by the mining companies for their capital construction activities;
- Import purchases by the mining companies for the inputs used in their operations;
- Interest payments on any international debt that was raised to finance the investments in the mines (capital repayments of foreign loans appear in the Capital Account of the BoP as do

the FDI inflows that finance the investments in the mines); and,

- Dividend payments to shareholders abroad.

The data made available to us from the survey of the three companies provides the life cycle *aggregates* for only the first three of these four components and these are summarized in Table 4.1. Thus far no dividends have been paid to shareholders from the mines in Tanzania – since no profits have yet been realized – and the companies point out those specific dividend policies will only be determined when profits do begin to emerge. So some of the entries in this part of the analysis are incomplete and so are subject to revision.

Table 4.1: Other elements of mining sector's current BoP impact through 2034 (US\$ million)

	Tanzanian (Local element)	Foreign (Import element)	Total
1. Capital costs of mine construction	586.0	1,249.1	1,835.1
Labour	270.0	131.3	401.3
Equipment and works	316.0	1,117.8	1,443.8
2. Capital expenditures during operations	921.8	1,748.6	2670.4
Labour	381.2 ²⁵	190.6	571.8
Spare parts and other equipment	540.6	1558.0	2098.6
3. Main operating expenditures²⁶	1574.8	8,436.3	10,011.1
Labour	242.9	1110.5	1,353.4
Contract services ²⁷	120.0	1,075.0	1,195.0
Energy costs (fuel and electricity)	385.6	2,185.1	2,570.7
Chemicals	92.0	827.5	919.5
Explosives etc	60.0	540.6	600.6
Other inputs	494.0	1976.2	2470.2
Maintenance supplies	180.3	721.4	901.7
4. Interest payment on debt financing	0	434.2	434.2
5. Dividends to shareholders		None paid to data and no data available about future policy	
Total foreign exchange outlays		11,868.5	

²⁵ For this element only no breakdown was provided by the respondents. So an arbitrary 67:33 split of the total labour element was assumed.

²⁶ The aggregate here is currently incomplete and therefore significantly understated pending the arrival of some missing data from some of the companies.

²⁷ This and the elements that follow were not disaggregated as between the Tanzanian and the imported elements by the respondents. Hence for the moment an arbitrary but small element has been ascribed to Tanzania and the balance to imports.

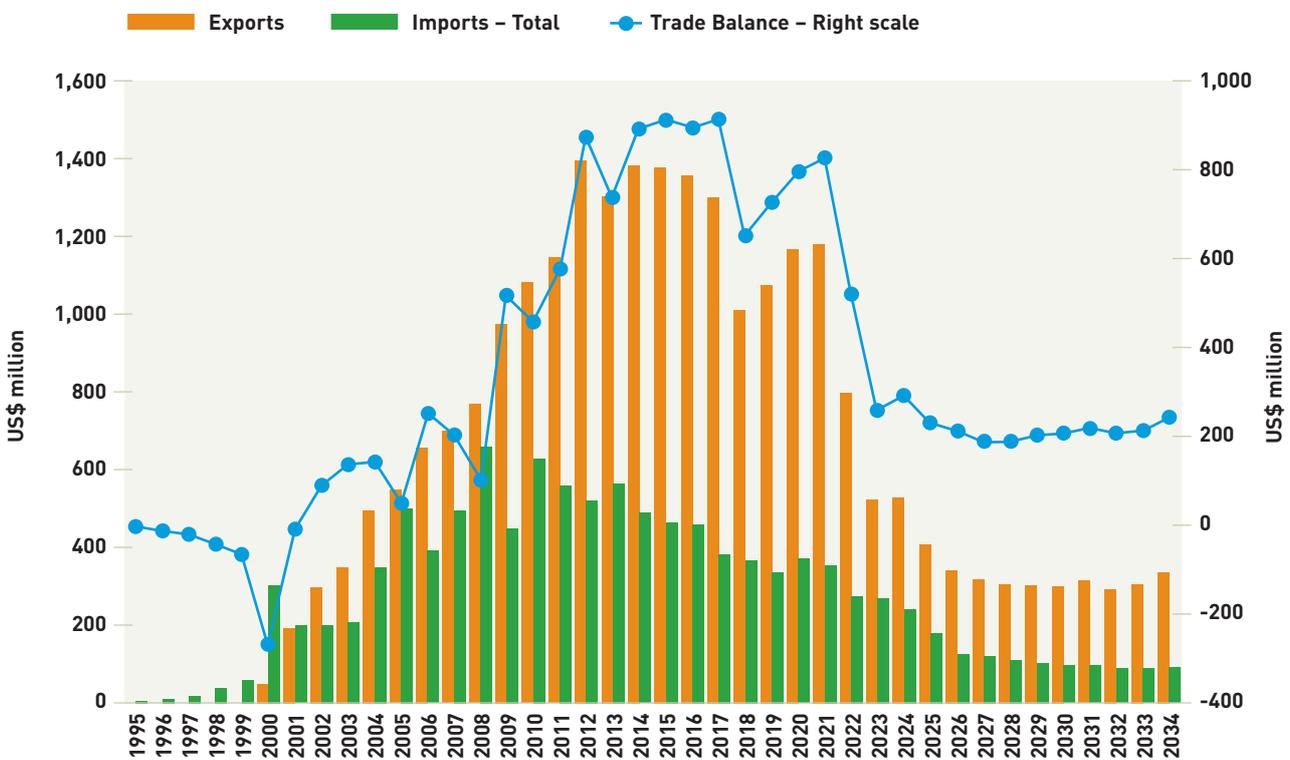
These partial data suggest that the total foreign exchange bill on the current account associated with the specified mines will amount to about US\$11.9bn over the combined construction and operating periods of the mines through 2034. This total includes the imports of equipment to both construct the mines and to deal with periodic maintenance. It also assumes that the bulk of the contract services employed by the companies as well as the bulk of their purchases of energy, chemicals and explosives are sourced from abroad. In addition to the imports of goods and services, the total includes the significant foreign interest payments incurred on the debt finance needed for the mines and also all the costs of expatriate labour²⁸.

Combining this total with the earlier information about gold exports, we arrive at a net current account foreign exchange total contribution through 2034 of approximately US\$13.2bn. However, this

contribution does not accrue on an even basis from year-to-year. The construction activity is of course lumpy and some of the routine maintenance costs also occur only periodically. The year-by-year contributions of the sector's likely contribution to Tanzania's BoP on the *trade account and current account* respectively is as summarized in Figure 4.4 and Figure 4.5.

It can be seen from this graphic that notwithstanding the significant trade deficit in the earlier construction years of the main mines (refer to the right axis for the deficit and surplus data), there are no periods from 2001 onwards in which the sector fails to realize a trade account surplus. In part this is because of the fortuitous staggering of the construction outlays of the mines for which we have data through time. The high import costs of some of the later mines after 2000 came at a time when the earlier mines were already generating off-setting export earnings. In the peak years from

Figure 4.4: Trade balance impacts from gold mining 1995 to 2034 (US\$ million)



²⁸ In reality some of this will be used for local Tanzanian consumption and in this sense the foreign exchange outlays are overstated.

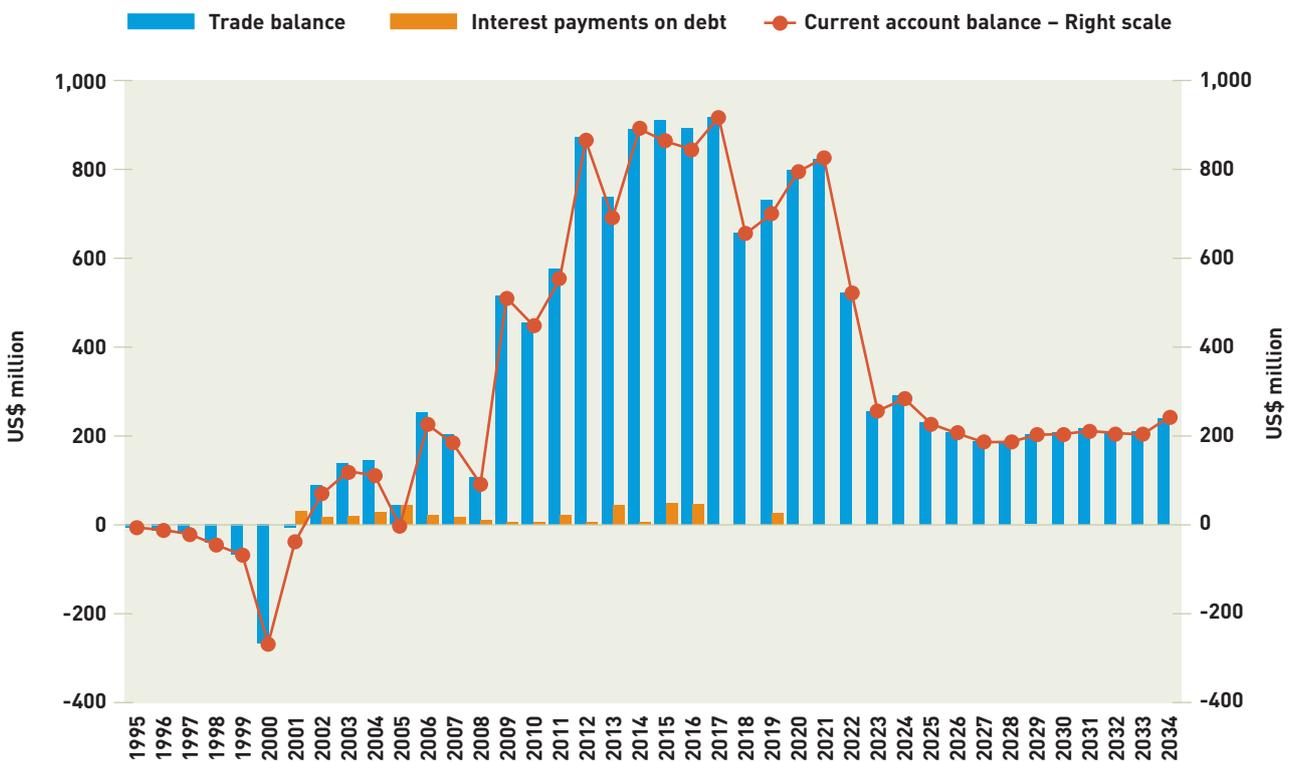
2014 to 2017 the gold mining sector seems capable of generating a trade surplus of close to US\$900m! This result has been achieved even though we have assumed a high import content on most categories of expenditure for which we were not provided with direct data. It follows that Tanzania has some scope to increase the trade surplus even more than shown here to the extent that increased local procurement can be encouraged.

The picture in Figure 4.4 needs to be further adjusted by deducting the payments of the interest due on foreign loans to develop the mines. This adjustment is presented in Figure 4.5 which therefore indicates (right axis) the near-full current account contribution expected over the life cycle of

the four mines²⁹. The evidence indicates that although the interest payments are large in absolute amount – totaling some US\$434m over the life of the mines, their impact on the current account surplus in most years is small. Tanzania seems able to look forward to a sustained period of some ten years from 2011 when the mining-generated surplus could be in the region of US\$600m to US\$800m per annum (subject of course to the assumptions made by our respondents about the price of gold).

There will be a substantial decline in the current account contribution of mining from 2021 if new mining activities are not undertaken prior to this date.

Figure 4.5: Gold mining and the current account 1995 to 2034 (US\$ million)



²⁹ This diagram awaits merely some estimates of the likely additional Forex payments in the form of dividends to foreign shareholdings.

C. Government Revenues

The summary of the life cycle tax payments that are anticipated by the three responding companies and their various mines is shown in Table 4.2. It is our understanding that the responses have been provided on the basis of the tax regime now in place and so do not reflect any possible changes (e.g. in the rate of royalty payments) that have been under discussion following the Bomani Committee recommendations.

It can be seen that the companies collectively report an expected total tax payment over the life of the four mines amounting to some US\$3.5bn. The numbers are subject to the normal uncertainties associated with any look into the future. They will also be subject to change depending on the current deliberations about possible amendments to Tanzania's current tax regime for mining. Greater precision will be introduced at least to the historical numbers included in the totals once the work on the Tanzanian EITI begins.

The most interesting aspects of this tax payments profile relates to the radically changing pattern over time. The criticisms of the prevailing tax regime by the *Golden Opportunity* report and others have focused *inter alia* on the long delays in making tax payments to government. The life cycle numbers provide the opportunity to examine this

issue in more depth. To this end Figure 4.6 provides a graphical description of the pattern of total tax payments over the period through 2034.

The diagram confirms one of the points of the critics of mining that in the early years of their licensed activities in Tanzania the companies paid only very modest amounts of tax in total. However, once the actual mining operations began in Resolute's Golden Pride mine in December 1998, Geita (July 2000), Bulyanhulu (2001) and North Mara (2002) the revenue receipts of government rose quite rapidly to the current (2007 and 2008) level of around US\$80m to US\$90m per annum as we deduced indirectly in Section 3.

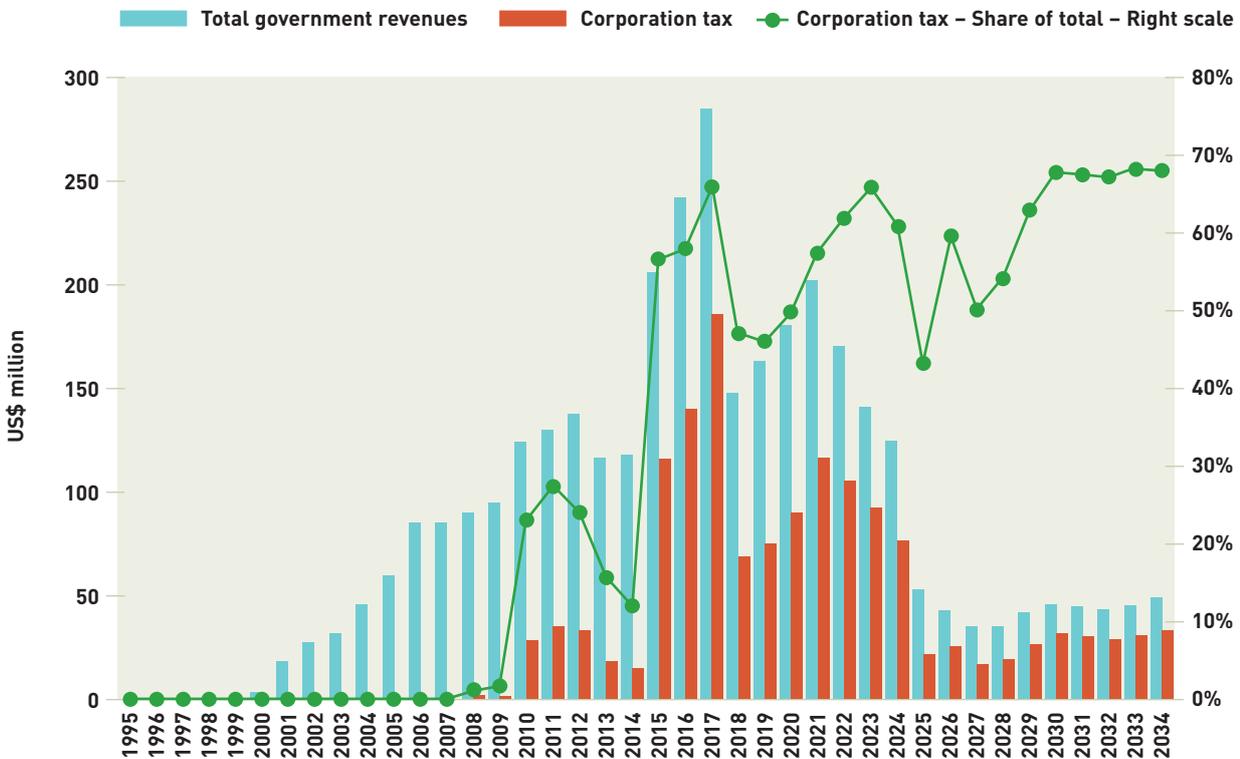
The evidence from the new graph points also to an issue that has received much less attention. This is that the revenue from the existing identified gold mines will rise to a peak of over US\$280m by 2017 and thereafter decline. The peak revenues will be achieved in large measure because of a large absolute and proportionate increase in the yield from the *corporation tax*: at the peak this tax alone is expected to yield some US\$186m a year. From about 2016 the corporation tax is also unambiguously and continuously the most important source of mineral sector tax receipts *even assuming the continuation of the present tax regime*. This continues to be the case even in the later years when the levels of mining production are in decline.

Table 4.2: Payments of taxes to government 1997 to 2034 (US\$ million)

Tax item	Amount paid or anticipated to be paid over the period
Royalties	791.1
Corporation tax	1,462.1
Employment levies and payroll tax	298.9
Value-added tax	267.7 ³⁰
Import duties	618.3
Local taxes	3.3
Licenses and other taxes	3.9
Total	3,463.5

³⁰ We are not sure whether or not this figure takes account of the eligibility of certain VAT payments to be refunded under the Mining Development Agreements.

Figure 4.6: Mining taxes to government 1997 to 2025 (US\$ million)



If we juxtapose this information with data from the most recent IMF review of the Tanzanian economy, we get some idea of the *peak* contribution of the present gold mines to the Tanzanian fiscal position. Specifically, the IMF reports a preliminary outturn figure for tax revenue in 2007/08 of Tzs 3,359bn which is the equivalent of US\$2.496bn³¹. This implies that the mining tax revenues in 2008 of US\$90m amounted to 3.6% of the total revenues in that same year. Assuming a nominal growth rate of total government tax revenues in dollar terms of 5% per annum through 2017, then total tax revenues would rise to US\$3.87bn. At that date mining revenues would account for 7.3% of the total. With a higher rate of growth of total revenues of, say, 7% the mining share would be 6.1%. At a slower rate of growth of total revenues of, say 3.5%, the mining share would be 8.2%.

In brief the evidence indicates that, *even under the present Tanzanian tax regime*, the tax contribution of the existing major gold mines alone will rise very significantly through 2017 in both absolute dollar

amounts and as a proportion of total government revenues. Thereafter the tax take will begin to decline and the government will need to rely on payments from new mining activities if it is to continue to enjoy such a high tax yield from the sector.

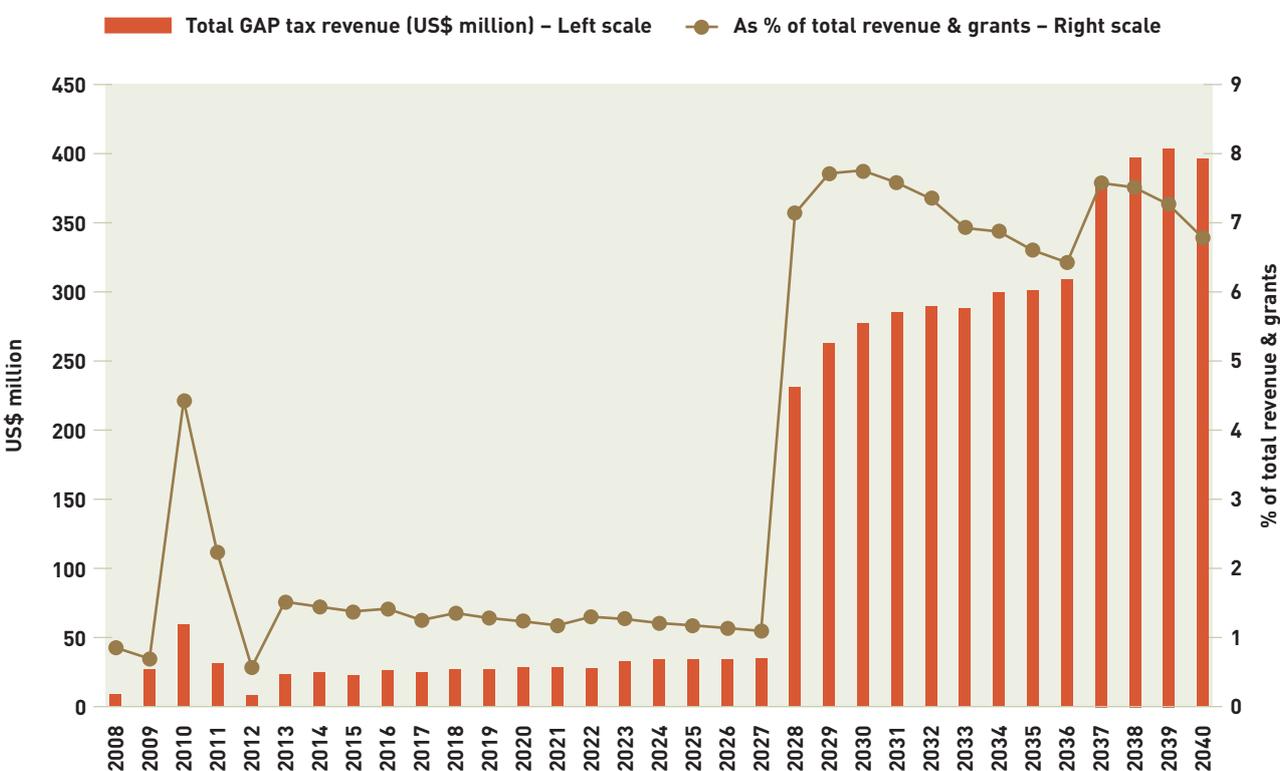
The pattern we see here is not unusual. The 2004–2005 REi case study of Ghana – a country which began its mining resurgence a decade earlier than Tanzania – found a revenue contribution of between 8% and 17% of total revenues in the years to 2003/04³². This was achieved with a taxation regime centered on a 3% royalty and corporation tax that was similar to that seen in Tanzania.

Similarly a forward-looking study of a single new bauxite mine proposed by the Guinea Alumina Company and based on very detailed calculations found a tax take that settled at 2% of the total for several years before accelerating to 8% of total revenue once the long-lived depreciation

³¹ At the exchange rate of US\$1 = Tzs 1,346 as at December 2008.

³² Source: ICMC *Case Study on Ghana*, 2005.

Figure 4.7: The revenue life cycle of Guinea Alumina



allowances were unwound. For purposes of comparison the revenue life cycle found in the Guinea study is reproduced as Figure 4.7. It can be noted there is a very long delay as depreciation allowances unwind.

Community Contributions

In addition to the tax payments summarized in Figure 4.6, all the mining companies in Tanzania pay and expect to pay significant sums in various forms of Community Contributions. These are partly the compulsory payments to address issues such as the compensation for resettlement and partly voluntary contributions to support local economic and social development. Unfortunately our data survey has not yet produced comprehensive, consistent and usable data on these contributions³³. Hence this present paper cannot comment on them with any authority. However, we can note that the partial amounts

reported to us add to some US\$172m over the life cycle with reported payments in some individual years as high as US\$10m.

D. Employment and Local Wages

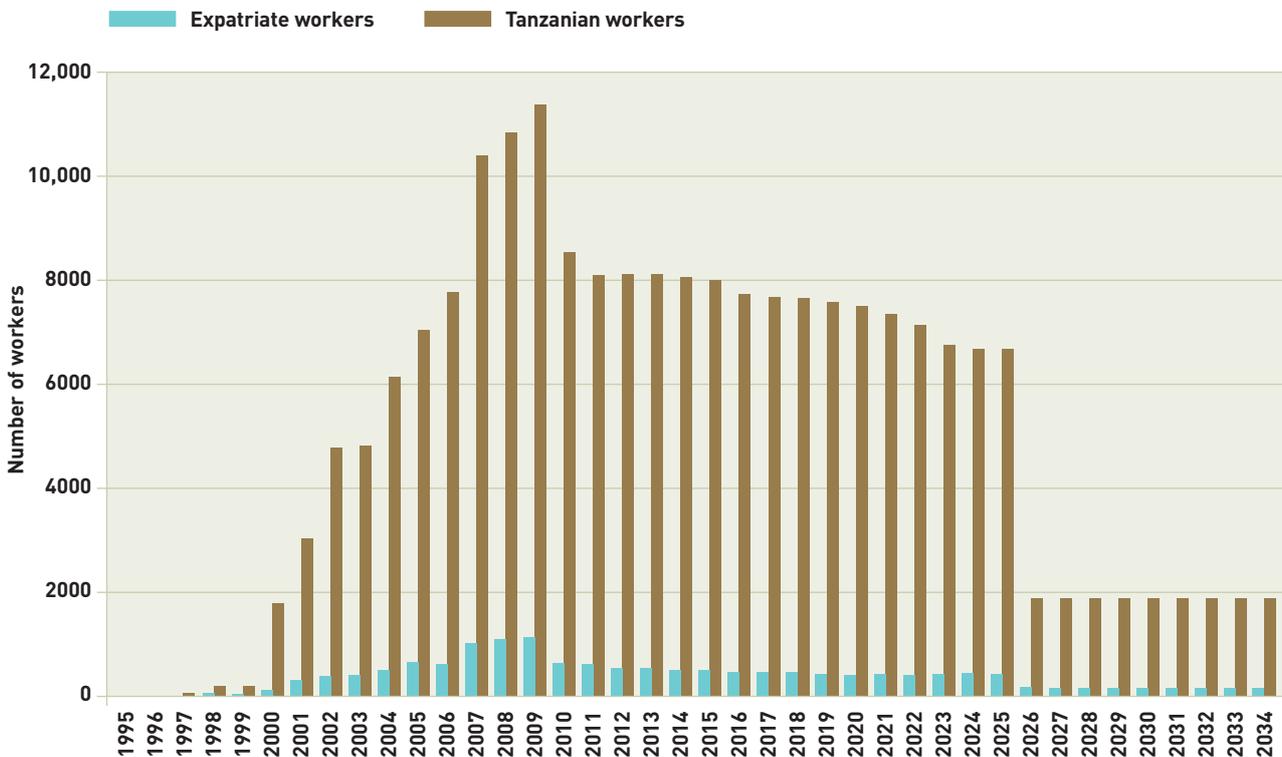
Our conceptual discussion in Section 2 indicated that the contribution of modern mining activities to *employment creation* is typically proportionately lower than the sector's contribution to export earnings and to government revenues. But the employment contribution in the case of Tanzania is far from trivial. This is confirmed by the data from the four mines that are summarized in Figure 4.8. These data relate only to the *direct* employment that is reported by the mines in both the construction and the operational phases of their activities. It *excludes* the labour used in ongoing capital works during operations and also the labour engaged by contractors to the mine. Both of these excluded totals are significant as can be seen from the dollar wage bills for local and expatriate labour shown in Table 4.1.

³³ The main problem is that while some companies provided data in some detail according to the various headings in our Template (see the Appendix A) this was not true of all of them: for example, some provided various degrees of aggregation across our categories. Hence the data aggregator was unable to provide data to us in a consistent manner.

The pattern that is shown is familiar from the experiences of other mining countries. In the early stages of the mining life cycle there is a rapid and large build up of the direct employment associated with the *construction* of the mine(s) and the associated infrastructure. In Tanzania the companies report the peak of the construction employment as being in 2009 when some 6,600 workers are engaged for this activity. However, the ongoing employment necessitated by further construction activities continues thereafter albeit at a lower level. The steady-state level of the *operational* work-force is expected to be achieved by around 2010 when the total workforce across the four mines should attain a level of some 8100 workers (of whom 3,100 will be classified as operational and the balance as construction workers). So *total direct employment* peaks at a level of 12,000 workers and then settles down to a level of between 7,000 and 8,000 thereafter. Total employment begins to decline significantly on the basis of present plans after about 2022.

Figure 4.8 also confirms the changing importance over time of Tanzanian and expatriate workers in the total of employment. Expatriate employment is anticipated to peak at some 1,100 workers in 2009 but thereafter to decline rapidly to only 450 staff by around 2015. The employment of Tanzanians reaches a level of more than 11,000 workers in the peak construction years and then settles down to some 7,000 to 8,000 workers in the main operational years. This is consistent with the amount shown in the *Golden Opportunity* report of around 10,000 new jobs. The data provided to us suggests that *the share of expatriate labour never exceeds 10% of the total and settles down at just below 6% for most of the years of full operation. However, this does not include any migrant workers from neighboring African countries although the numbers involved in such migration are also likely to be small.*

Figure 4.8: Employment in gold mining 1995 to 2034



These employment numbers – which we must remember exclude contract and some other labour – should also be examined against the background of two contextual factors. First, there is the context of the overall Tanzanian employment situation. The BNS *Integrated Labour Force Survey of 2000/01* indicates a total Tanzanian labour force of some 16.9m persons of whom 15.6m have some form of employment status (including the majority self-employed). But of the 16.9m total, the large majority namely 13.9m are engaged in agricultural including subsistence activities. This leaves a non-agricultural total of around 3m persons of whom fully 2.44m are engaged in trade and other services including public administration. The remaining sectors such as manufacturing, **mining**, utilities, transport, and construction are all small employers in absolute terms. According to the Labour Force survey they account for 1.5%, **0.2%**, 0.1%, 0.7% and 0.9% of total employment respectively. So, for example only the manufacturing sector employs more than 1% of the total work force; construction is the other most significant employer of labour. The formal mining sector employs more people than do the utility sectors such as gas, electricity and water (which are also capital intensive). But none of these five sectors are characterized by particularly large contributions to Tanzania's employment problem³⁴.

The second contextual factor relates to the significant *employment multipliers* that can be associated with mining even in an African context. The indirect jobs created by the mining sector in the continent's leading mining country namely South Africa are extremely large indeed³⁵. But even in less well developed economies the multipliers can, with appropriate supporting policies be in the region of 3 or more indirect jobs for every directly created job³⁶. In this context the 10,000 direct and increasingly skilled jobs associated with the specific mines on which we have data can be seen as an opportunity to create a very much larger number of indirect jobs through the opportunities created by the mining companies' own spending and also via the induced effect on local businesses of the spending of miners wages. This opportunity remains to be taken and is the leading example of where the policies complementary to mining sector policy itself are needed to create the positive benefits that undoubtedly are available in Tanzania as elsewhere.

³⁴ The relatively small numbers of direct employment created by the modern mining activities are often contrasted (unfavourably) with the very much larger numbers of 'jobs' provided by artisanal mining. However, the *Labour Force Survey* does not recognize this category of employment: its mining total would be much higher than 0.2% of the total labour force was it to do so. Presumably the artisanal miners – many of whom engage also in farming and other non-mining activities – are included in the large agricultural element of the total labour force! *A Golden Opportunity* refers to self-employment in small scale artisanal mining in the 1990s as totaling anywhere from 500,000 to 1.5m persons. At the lower of these levels the artisanal mining sector would have employed more people than the total of employment in formal mining plus manufacturing plus utilities plus construction. At the higher number, artisanal employment would have exceeded all the employment in the trade sector of the economy!

³⁵ A study by the Industrial Development Corporation of South Africa of the large Hillside Aluminum project at Richards Bay in South Africa found output multipliers (measured by reference to GDP) of 2.83. This study also suggested that more than 9,000 extra jobs could come just from the induced effects of higher expenditure as compared to only a little over 1,000 direct jobs from the project.

³⁶ A 2006–2008 Arthur D Little study examined the large Mozal aluminum production facility on Mozambique. This revealed a multiplier for the construction phase that averaged 1.88. For the operational phase the multiplier was found to be around 2.90.

Figure 4.9: Wages in gold mining 1995 to 2034 (US\$ million)



Turning to the question of the *wages and salaries* injected into the economy by the four mines, Figure 4.9 provides a convenient graphical summary. In total the wage bill increases to a total of more than US\$200m during the construction phases but also exceeds US\$100m for much of the operational life of the mines. These figures *exclude* the often considerable labour element in contract work and in the ongoing capital upgrading that occurs throughout the life cycle: a cost that adds up to US\$30m in some years.

It is clear also from Figure 4.9 that the average (per person) wage and salary costs of the expatriate personnel (who account for less than 10% of the total work-force) is significantly higher than that of the Tanzanian workers. However, the implied wage rate of the average Tanzanian worker (1) is high by established local standards with a calculated average figure (excluding housing and other perquisites) of around US\$5,000 – US\$7,000 in the early years; and, (2) rises over time to a peak of around US\$14,000 which may reflect the gradual increase in skill levels as expatriate workers decline in relative importance.

Three Key Conclusions

5



5. Three Key Conclusions

The data analysis of the mining life cycles for the composite of the five active mines presented provides us with a great deal of new information about the likely future shape and size of the mining industry in Tanzania. In Section 6 we will use this information to comment on some aspects of the reform agenda for the sector. But first it is helpful to draw out what seem to be the *three* key conclusions from the analysis to-date. These are as follows:

1

Mining – an established element of good macro performance

Mining in Tanzania and especially gold mining has quickly (since 2000) become a major part of Tanzania's current macroeconomic performance and its recent successes in achieving higher rates of economic growth. The country's foreign exchange earnings already rely to the tune of some US\$750m per annum on mineral exports and no other individual activity in the country comes even close to matching this. Certainly the mainstay exports of even a decade ago such as coffee no longer seem able to provide the basis for such substantial earnings. Even when imports into mining are taken into account the net foreign exchange earnings amount to a *current* level of some US\$250m or more per annum: even this net figure is on a par with Tanzania's *recent* total earnings from traditional exports such as coffee and tea. Similarly, gold mining remains the major single reason for Tanzania's new status as a leading African attraction for new *foreign direct investment* into private productive activity. The sector – although still in its infancy – already contributes some 3.6% of total *government tax revenues* and is already one of the largest single sources of tax revenue for the government. The government could not readily replace the US\$90m – US\$100m per annum that this revenue represents. Although the sector cannot claim to be a huge *employer of labour* it is still large in this respect relative to other respected industries in the country such as the utility sectors of electricity and water. Additionally, an increasing proportion of those jobs are local and involve skilled and well paid persons.

2

Five existing mines can ensure an increased contribution in future

The life cycle analysis presented in this paper relates to only three main companies and five main operating mines. However, the information provided by these companies, although incomplete and preliminary in some respects, enables us to see the broad tendencies over the next 10–20 years with some clarity. In relation to foreign exchange earnings the indications are that total export earnings can rise much further to a peak of some US\$1.4bn by 2012–2016: double the present earnings. The unwinding of the depreciation allowances is expected to mean a similar large increase in the mining sector's tax payments to government to a peak of some US\$280m – almost three times the 2007 level – by 2017 of which US\$186m will come from the corporation tax. At this stage the sector seems likely to be responsible for some 6–8% of all government tax revenues! These expectations are linked to the feasible level of gold production from the identified mines that can increase on reasonable assumptions by a further 40% from the 2007 levels. This takes no account of discoveries and production from the various other mines that are already present and under exploration in Tanzania³⁷.

3

But further investment is needed to sustain these achievements

One of the most important facts to be revealed by our survey of the three companies and their five mines relates to the high level of ongoing capital investment that is expected and also needed to produce the results described. Specifically, in their responses to our survey the companies indicated an early stage total investment in *mine construction* totaling some US\$2.32bn: a figure which reconciles reasonably closely with UNCTAD and other external sources of information. But in addition they report an expected additional outlay for what we have termed *Capital Outlays during Operations* of US\$2.67bn over the period to 2034 (see also Table 4.1 for the composition of this total). In some individual years the amounts of such new investment amount to more than US\$100m. On average over 34 years the outlays amount

³⁷ In 2007 there were 296 operating licenses and more than 4,000 prospecting licenses.

annually to 3.4% of the initial capital costs of constructing the mines. These are large amounts which the companies seem prepared to make. However, it would be a mistake to assume they are completely assured in all circumstances. For example any significant fall in the world gold price or a major increase in the tax burden on the companies would likely change the calculus at the margins and result in somewhat lower levels of new capital investment. Similarly, gaps in production, exports and tax revenues will definitely emerge as the five identified mines reach the end of their productive lives. If the authorities wish to retain gold as a major contributor to Tanzania's macro performance then these gaps will need to be filled by new discoveries and the opening of new mines. The capital costs of these activities are likely to be large and they are certainly additional to the numbers quoted in this present paper.

'If the authorities wish to retain gold as a major contributor to Tanzania's macro performance then these gaps will need to be filled by new discoveries and the opening of new mines.'

Selected Policy Implications

6



6. Selected Policy Implications

The information elicited by this paper provides a perspective on future mining policies for Tanzania that has not previously been exposed. That perspective sharpens our knowledge of the implications that will follow from the policy choices that the Tanzanian authorities have been actively debating for some time. The life cycle data tells us above all that the recent dramatic upsurge of mining's importance in the Tanzania macro-economy could be sustained *but might just as easily become a relatively short-lived episode in the country's economic history*. Poor decisions at this juncture could well ensure that the gaps in production and exports that we identify as likely from around 2020 and beyond remain just that – namely unfilled gaps that would then require investments in other *non-mining* activities if they were to be filled.

Because of the huge and entrenched controversies surrounding mining in Tanzania with which the researchers began this paper, this prospect of the mining surge possibly coming to an end from 2020 onwards will engender different reactions from different interested parties. Commentators such as the authors of *A Golden Opportunity* who have bemoaned the disappointingly low revenue, employment and local development impacts of mining so far may shed few tears at such an outcome. Others such as the author of this paper who have watched with interest for 45 years to see the diversification of the economy promised by the immediate post-Independence planning documents will be left wondering where the alternative modern productive activities to replace mining will be found: they were patently *not* found in the 35 years to 1999.

Others who might be distressed to see mining's contributions coming to an end will include officials in the Ministry of Finance who will worry about how to replace the supposedly 'small' US\$90m – US\$100m of annual revenue they currently receive from the sector – after all this 'small' sum is set to be larger than most of the other revenue streams from aid, debt relief and larger tax payers outside the mining sector. Their colleagues in the Central Bank may similarly be worried about the prospective loss of up to US\$700 to US\$800m of annual export revenues that were not available to the country just nine years ago! Can this economy

really run once again on the basis of sisal, coffee, tea and cotton?

None of this is an argument for defending a long-term future for mining in Tanzania *at any cost*. This paper certainly does not advocate anything like that. However, our analysis does suggest the need for great caution in fundamentally amending a regulatory regime that has served Tanzania quite well for the past decade to the point that it has transformed certain key features of the country's macroeconomic (if not its local economic) performance. The Bomani Committee makes the case for adjusting the regime in a number of directions to eliminate some obvious distortions (e.g. the fuel tax subsidy) but the case for major shifts is not obvious³⁸. For example, our present study shows that even with the present regime, the more efficient corporation tax will be delivering the bulk of the mineral tax revenues to the Tanzanian government in a few years time. This means that the unsatisfactory features of the mining royalty will become relatively less significant. Similarly the EITI properly implemented will address many of the informational criticisms of the present tax regime advanced by the critics³⁹.

Instead there seem to be two main policy messages coming from the paper:

- First, the time horizons involved in modern mining activity of the type seen in Tanzania and elsewhere are extremely long – certainly much longer than the planning horizons of most governments. Policy decisions when they are made should try to recognize this reality. In particular, this paper confirms that the nine years since 2000 when the first large new mines started to operate provides an evidence-base which is far too short to assess the full contribution of the sector to the economy.

³⁸ In this context it is useful to refer to the comprehensive recent review of the international Mineral Taxation literature that was undertaken recently as one part of the ICMM research agenda. See ICMM and Commonwealth Secretariat, *Minerals Taxation Regimes: A review of issues and challenges in their design and application*, London, February 2009. This study shows inter alia that there are good reasons for avoiding too much dependence on inefficient Royalty-based systems of taxation relative to systems based more squarely on the more progressive Corporation Tax.

³⁹ Although it goes beyond the scope of this present report we feel that the Tanzanian participation in the EITI as recently announced might usefully be followed by a government commitment to make public all future Mining Development Agreements (MDAs). This would put an end to the rather unproductive and ultimately futile arguments about the sector based on ignorance about what exactly has been agreed as the terms of mining's presence in particular locations.

Tanzania's decision-makers need to factor in a somewhat longer period if they are to recognize fully the sector's potential contribution to the economy. If they are able to extend their vision in this manner they will see a contribution in macroeconomic terms in a few years time which is significantly larger than that seen today. The officials in the Ministry of Finance and the Central Bank will see significantly higher revenue and foreign exchange contributions than those that they can find in today's statistical record. Similarly the evidence from other similar countries that are a bit more advanced into the life cycle is that some of the local economic benefits of mining take time to be realized. It is not easy in an agrarian – mainly subsistence economy – to build the supply chains that can contribute the *indirect* employment and incomes that the presence of a new mine can catalyze. But evidence from other countries tells us that these indirect benefits of mining can be very substantial – maybe two to three times the size of the immediate direct benefits.

- The second main policy conclusion stems from our recognition in Section 2 of this paper that the *direct* local employment impacts of a modern mining activity are unlikely to be large *in any country*⁴⁰. It is a question posed forcefully in the Tanzanian context by the *Golden Opportunity* report as to why the huge national and local spending associated with the modern mining sector has so far been of only limited relevance to the economic and social development prospects of the affected mining districts and regions. Does it need to be like that in the longer term?

The answer is a categorical *no* – the policy makers have it in their own hands to take far greater advantage from the local and regional spending associated with the new mines to achieve a much greater local and regional impact than seen so far. But this matter is definitely not resolvable by squeezing a bit more short-term revenue from existing levels of production.

On the contrary, the huge ongoing total spend (on mine construction, on operating supplies for the mine, on ongoing maintenance, on miners wages and their on-spending) presents the Tanzania planners with a wholly unique opportunity to catalyze that spend as the basis for the longer term economic advancement of the mining-affected districts and regions. Mining activity was the initial basis for the broader-based economic development of mining regions in today's advanced economies such as California in the USA and Victoria in Australia. There is no fundamental reason why good complementary policies cannot produce a similar dynamic in the African context.

So the second message is not to interpret the disappointing local income and employment effects *to-date* as a fatalistic indication that it needs to be like that in the future. Instead the policy advice is to look for those complementary actions that have the potential to convert the direct spending of the mining companies into a much broader set of economic development benefits. The report of the Bomani Committee has many specific and important suggestions about what some of these complementary policy actions might be. Unfortunately that report itself does not present these in a fully integrated manner linked to the theme of *local and regional development* in the areas of Tanzania most impacted by the new mines. Rather the recommendations are presented as separate and independent ideas and are scattered throughout the report: it is largely left to the reader to join them together.

One unfortunate result has been that discussion emanating from the Bomani report has been heavily focused on the need to reform the revenue system and extract more short-term revenue from mining. Our life cycle analysis suggests that this one narrow problem should soon take care of itself as depreciation allowances are unwound and more is paid in corporation tax. It is important now to focus much more centrally on the Committee's important recommendations pertaining to the vital local and regional development agenda and not treat these as merely the sideshow to the 'main' revenue event!

⁴⁰ We refer here to the relative size of employment in the context of the overall labour force of a country. It is evidently the case even from this Tanzanian study that the absolute number of persons employed can be large especially in the open pit mining that is common in Tanzania.

As the map in Figure 1.1 indicates, the areas of Tanzania that are mainly impacted by the new mines are reasonably contiguous, spanning points south and mainly west of Lake Victoria (such as Tulawaka and Geita) round the southerly end of the Lake through Bulyanhulu and then up to the more northerly and easterly locations at Buhemba and North Mara. An integrated package of new policies could achieve significant improvements in employment, incomes and welfare more generally in at least a part of this mining-affected area in that part of the country.

Here are just a few of the recommendations from the Bomani Report that if bolted together as a strategy for the affected regions could collectively have a large pay-off in terms of future development prospects for the area. It is stressed that it has not been a central purpose of this present paper to advance a fully-worked out local development program. So the ideas below are merely illustrative of the types of things that such a program might reasonably contain.

Infrastructure

The Bomani Report recognizes very explicitly the responsibilities of government to provide supporting infrastructure in mining areas covering roads, electricity, water and social services such as village dispensaries, schools and security services⁴¹. Some of these services have direct relevance for the operations and so the cost-base of the mines themselves. Other services are more directly relevant to the well-being of the mine-affected populations⁴². The Bomani Report notes that if the government itself is unable to put the requisite infrastructure in place then it should seek to do so in collaboration with private investors (and we can add with possible further help from donor agencies). On the specific subject of electricity and access to the grid, a concerted effort to extend capacity across the contiguous mining regions would serve to eliminate the contentious issues about the diesel fuel subsidies⁴³. The companies

need this subsidy only to compensate for the high costs of having to generate their own electricity.

Mining towns

Bomani argues that the development of such towns has been haphazard and has happened in a manner that has left some of the affected populations without proper access to the normal social and other supporting services. The Report recommends the government to work more closely with the companies (and possibly we can add the donor agencies) to plan and monitor the development of these towns⁴⁴.

Enhanced local revenues

Bomani advocates a Ghana-style distribution of a part of the Royalty revenues. This would provide 10% of that revenue to the districts where there is actually a mine located; 7% to adjacent districts that will also see some impact from mining; and 3% directly to the villages around the mine. In Ghana this system has worked only moderately well and is now being enhanced through explicit government and donor programs to improve the technical capabilities and accountability of the districts receiving a share of revenues. With such enhancements this system could be strongly recommended also for Tanzania.

Improved implementation of compensation schemes

Bomani recommends a number of tightening-up changes in the existing systems for compensating farmers and others who lose access to land as a result of new mining activity⁴⁵. Compensation revenues can provide the basis for the beneficiaries' funding of new types of business activity. If the arrangements (e.g. for SME promotion) are well integrated with the needs of the local communities (including the mining companies) then the possible loss of local livelihoods can be reduced or even wholly eliminated. The new business can become a part of the new development dynamic in mine-affected areas.

⁴¹ Executive Summary Section 2.1.

⁴² The Report notes that 'For a large project like Kabanga Nickel, the Government should start preparations to put in place infrastructure such as electricity, roads and railway line in order to ensure processing of minerals from the mine is done in the country'.

⁴³ On specifics, Bomani mentions the potential of low development cost sources of energy such as Stieglers' Gorge, Kiwira, Mchuchuma, and Ruhudji. It recommends that these should be initiated and developed by TANESCO so that electricity is available to other sectors including the mining industry.

⁴⁴ Executive Summary Section 2.1.

⁴⁵ Executive Summary Section 2.8.

Training

It is one of the recurring criticisms of the mining development so far that insufficient numbers of Tanzanians have been engaged. But as a relatively new mining country, Tanzania inevitably lacks the requisite and increasingly high-level skills to meet the needs of the companies. A long-term program of training is one obvious answer with the responsibility for this being a shared responsibility between the national as well as the corporate stakeholders. Bomani recommends a combination of tighter legal requirements on the companies in this regard with a more systematic set of government-driven arrangements, including larger budgets for existing colleges and other training institutions⁴⁶. This is an area where much more might be done and where policy could be well informed by the long-standing arrangements seen in other African countries: e.g. the University of Mines and Technology at Tarwa in Ghana which now exports some its graduates to other countries.

Enhancing value-added

Bomani makes some useful suggestions about ways to add some value to the mineral products that are exported and to ensure assistance in marketing of the enhanced products⁴⁷. Although the impact of this is likely to be small relative to some of the other points discussed, it represents a useful component of an integrated program. In addition, the Report recommends a more coherent set of arrangements for establishing strategies for the possible beneficiation of some minerals such as nickel. It is understood that the high energy costs and other complexities (e.g. of smelting rock containing both gold and copper) may limit the scope for such beneficiation but it is important for there to be solid information about the possibilities to allow an informed policy decision to be taken.

Integration of mining and the broader economy

Recommendations in this area constitute arguably the most important in the whole of the Bomani Report. So it is disappointing they are described only very briefly in the recommendations. In brief Bomani argues for two main things⁴⁸. The first is the strengthening of any sector that works closely

with the mining sector to capture ‘*the immense benefits that the growing mining industry provides*’. The second is a plea for more explicit and effective arrangements to promote the greater local procurement of goods and services. The second of these tasks is proposed to be undertaken in partnership between a proposed new Minerals Authority and the Tanzanian mining companies through the Chamber of Mines. The strategic strengthening of electricity delivery through TANESCO would be an explicit part of this improved integration as would the ‘urgent’ improvement of the central railway line. More systematic land-use planning in the broad catchment areas of the mines would also be part of the proposed package.

Overall this represents a very impressive agenda. There is a strong case for developing it further as an *integrated* program for district and regional development based around mining as the catalyst. There are good models from other countries for developing and implementing such approaches. These involve a variety of modalities including the formation of specialized Regional Development Authorities through the extended role of existing forms of sub-national governments as found in Tanzania. Mining’s future in the Tanzanian economy is certainly important enough to justify a great deal of more in-depth work on these alternative approaches in order to establish the best way to pursue the very significant possibilities in Tanzania.

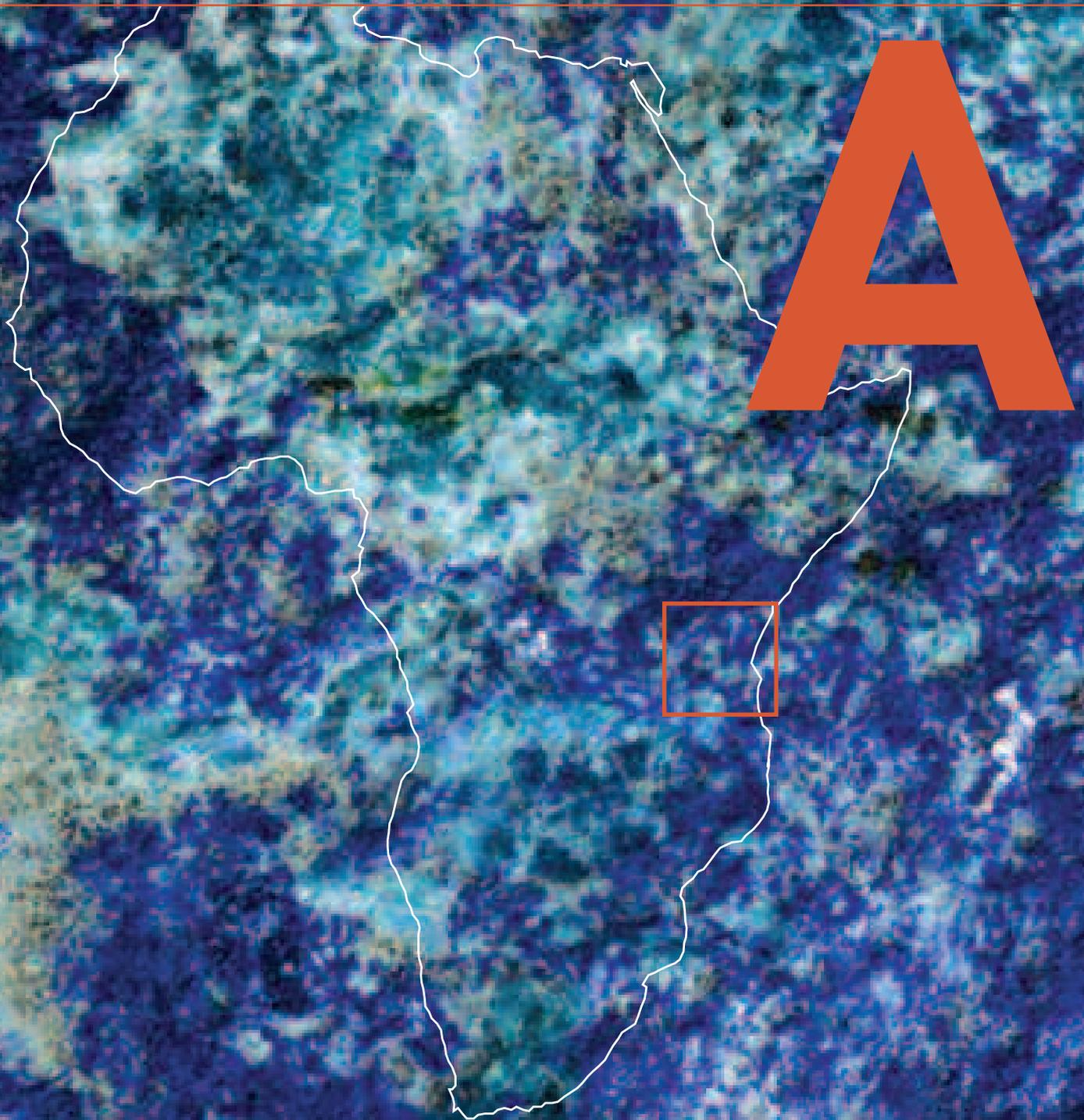
We are quite clear that significant local development *can indeed* be built upon the large mining base already present in the country if there is a will to do so. But it is equally clear that without *explicit* efforts to do this much of the contention around the sector will persist. Further, improvements in this area can readily defuse the pressure for a short-term push for greatly increased revenue extraction: a push that could have a significant bearing on whether the forthcoming production gaps which our analysis has identified will or will not be filled by further new investment.

⁴⁶ Executive Summary Section 2.8 (please note that the numbering system in the English translation repeats some of the section numbers).

⁴⁷ Executive Summary Section 2.9 and 2.11.

⁴⁸ Executive Summary Section 2.12.

Appendix



Appendix A

Notes on Template for Assembling Company Data

Introduction

The Template attached is designed to collect detailed operating data from at least *three* operating companies in Tanzania. These data will be aggregated by an independent aggregator appointed by ICMM and agreed by the companies. *None of the individual company data will be released to any other person.* The consultant team chosen by ICMM will have access only to the aggregated data and to any supporting qualitative notes provided by the companies. They will combine their numerical analysis with qualitative analysis of information about the social and economic programs of the mining companies that is already available in the public domain.

Objective

The objective of this exercise is to enable a consultancy team to analyze and describe the benefits and costs of mining in Tanzania over a long time horizon that will embrace the full operating period of the mines that participate. This has not previously been done for gold mining in any country in Africa. However, a template very similar to that proposed here has been used most effectively in collaboration with the Guinea Aluminum Company (that includes BHP Billiton) to analyze and describe a large new proposed bauxite/alumina project in Guinea. The data requested will enable the consultancy team to provide a comprehensive analysis of the aggregated mining operation's 'life-time' benefits and costs, embracing issues such as the impact on Tanzania's economic growth, its future income, its balance of payments, its employment, its public revenues and some at least of its social problems. By doing so the new analysis has the potential to significantly enhance the information basis of any dialogue about the role of mining in the country's longer term development.

Participants

The assumption at this stage is that all the companies participating in this exercise in Tanzania will be mainly *gold mining* companies. Some adjustments to the template will be needed should other types of mining company decide to participate.

Type of information requested

The format of the template is in *eight* blocks corresponding to:

Basic Information – These data will *not* be aggregated

- i. Revenues
- ii. Operating Costs
- iii. Community Contributions and Compensation Costs
- iv. Capital Costs
- v. Capital Financing
- vi. Royalties and Taxes
- vii. Closure Costs

The data request seeks to balance (a) the need to keep the burden of work falling on the companies to a minimum by using concepts and aggregates that should appear in standard company operating accounts with (b) the need to be able to aggregate data across the different participating companies. Hence, the component data requested under each of the headings (i) to (vii) has been kept as simple and standard as possible. For example energy costs have been grouped to include both the costs of heavy fuel oil and the costs of any purchased electricity. But it is recognized that the data requested may in this and other cases be rather more aggregated than the information that will appear in the companies' own operating and management accounts. Respondents are requested to fit their data responses to this format as closely as possible. Where they cannot reasonably achieve such a fit, it is better to provide more rather than less detail. In these cases too supporting notes would be likely to give the aggregator a more realistic chance of being able to match the data returns of the different companies in a meaningful manner. The person selected by ICMM as the aggregator will be available to answer specific questions as the work of compiling the data proceeds and will also request the opportunity to go back to individual companies to seek clarifications as necessary.

Time periods

Data is being requested on an *annual basis* for all the years during which the mine is expected to operate from the start date of construction through to the date of closure. Respondents should use their own accounting years. It is hoped that all companies will be prepared to provide data from now (2009) through to the date of expected closure. In addition and since all the mines in Tanzania are relatively new, some previous-year historical data would be helpful in the cases of those mines that started operations before 2009. In these cases, respondents are asked to provide those historical data on a price basis that permits of meaningful comparison with the 2009 data.

Price basis

In order to assist comparisons over quite long periods of time, respondents are asked if possible to provide the data for 2009 and later years in the prices and costs of the present (i.e. 2009). However, if they have the capability to provide some or all of the same data on a *current price* basis (e.g. using their own assumptions about how, for example, wage costs and fuel costs may increase in the future), then those parallel data would be most valuable for some of the analytical uses that are envisaged.

Multiple mines

If participating companies operate more than one mine operation in Tanzania for which they maintain separate and distinct accounting data then it would be appreciated if a separate template could be completed for each of these mines. If a company operates several mines but maintains an integrated set of cost and other accounting data covering all mines then a single template return will suffice.

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Oxford Policy Management

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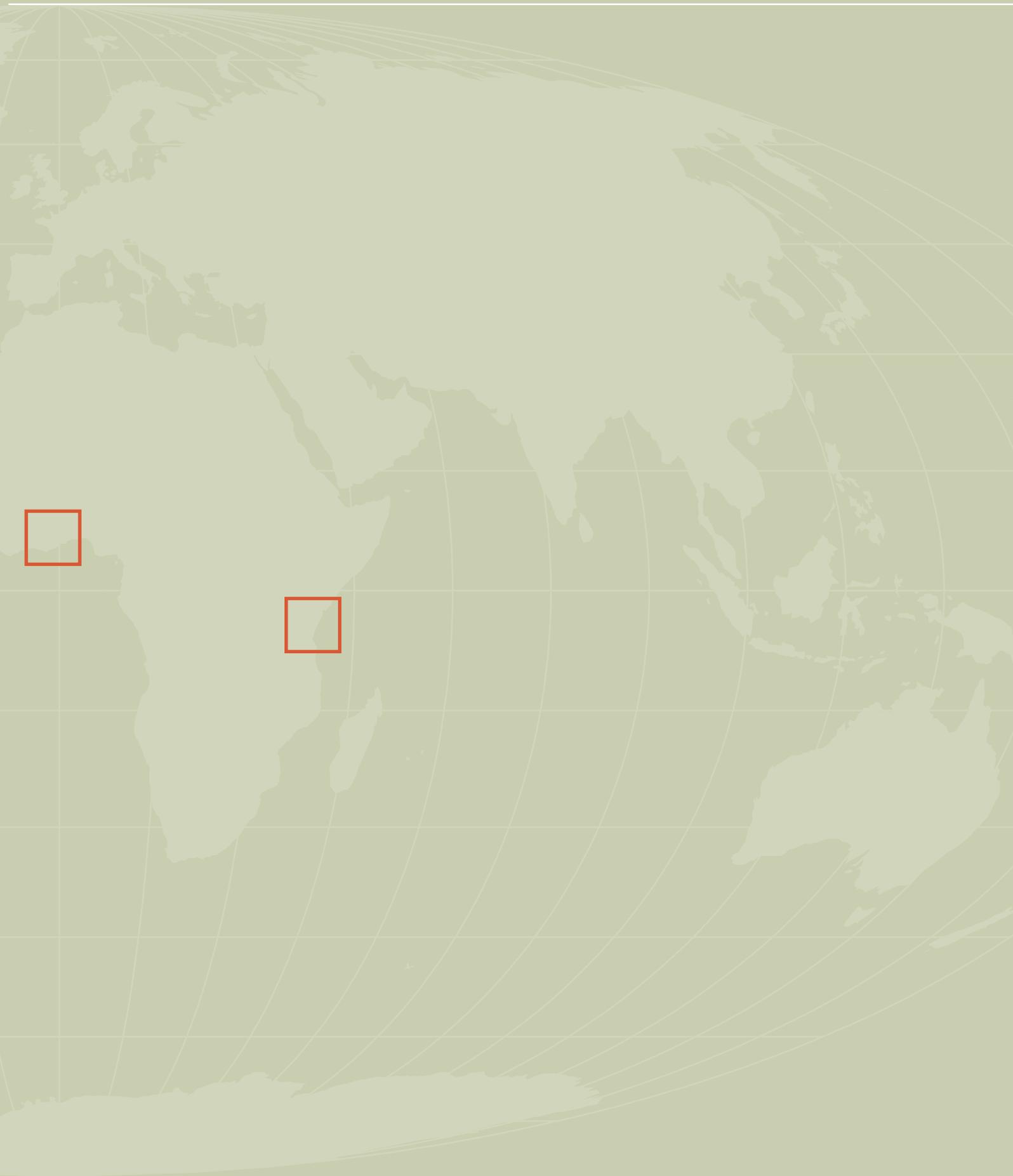
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