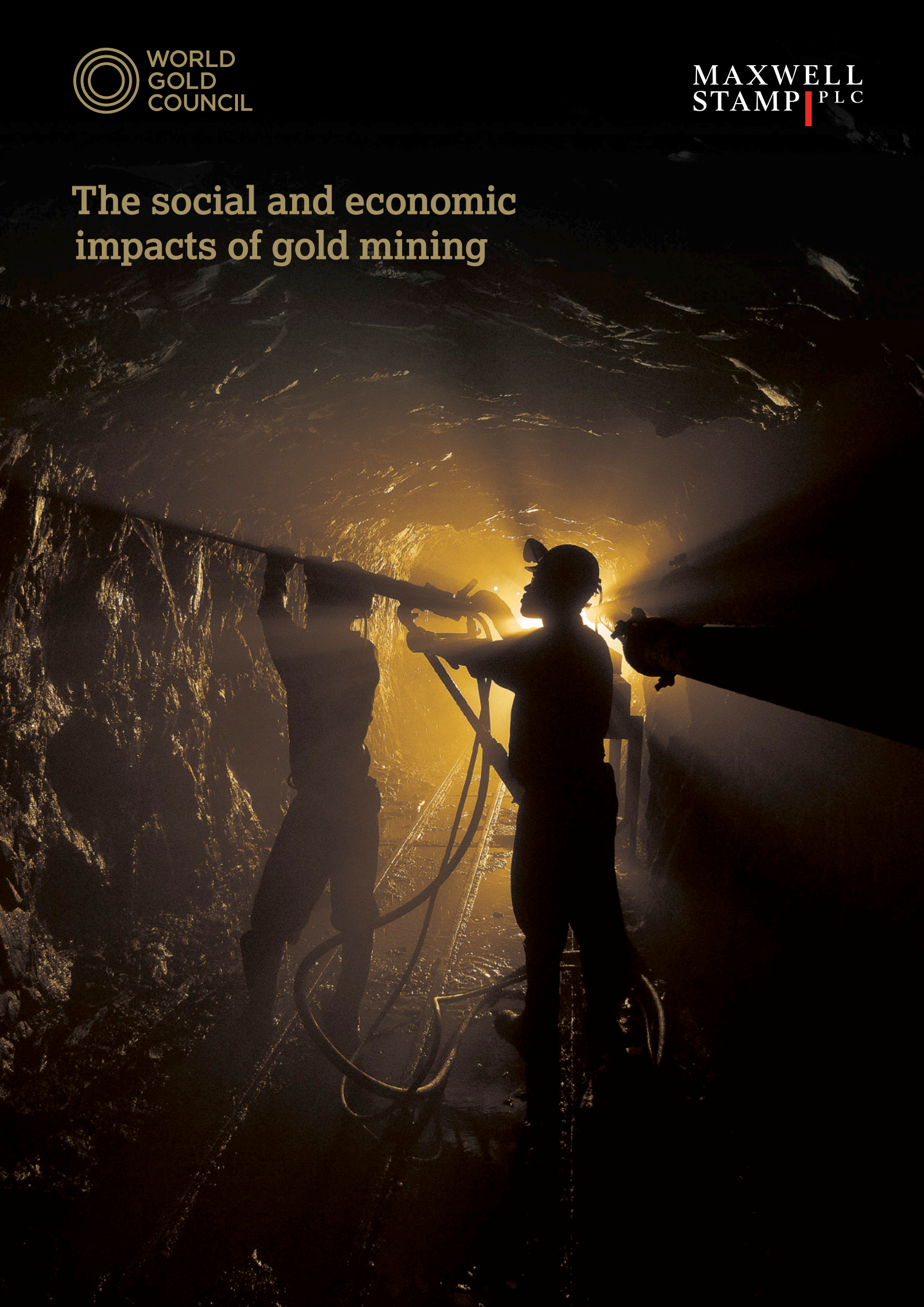


The social and economic impacts of gold mining



The social and economic impacts of gold mining.

A research study by Maxwell Stamp commissioned by the World Gold Council.

About the World Gold Council

The World Gold Council is the market development organisation for the gold industry. Working within the investment, jewellery and technology sectors, as well as engaging with governments and central banks, our purpose is to provide industry leadership, whilst stimulating and sustaining demand for gold.

We develop gold-backed solutions, services and markets based on true market insight. As a result we create structural shifts in demand for gold across key market sectors.

We provide insights into international gold markets, helping people to better understand the wealth preservation qualities of gold and its role in meeting the social and environmental needs of society.

Based in the UK, with operations in India, the Far East, and the US, the World Gold Council is an association whose members comprise the world's leading gold mining companies.

About Maxwell Stamp

Maxwell Stamp is one of the world's leading international economics consultancies. Established in 1959, they have over 50 years of experience in over 165 countries and territories, with a strong track record in developing and transitional countries and expertise across a wide range of competencies and policy areas: from international trade to rural livelihoods, from privatisation to financial reform, from gender to industrial strategy. Through the services delivered for clients, Maxwell Stamp is committed to working towards the eradication of poverty and increased social well-being.

Acknowledgments



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Executive summary

Despite the industry's scale, the socio-economic impacts of the gold mining industry are not well understood.

Gold mining companies are a major source of income and economic growth, with an important role in supporting sustainable socio-economic development. During 2013, gold mining companies contributed over US\$171.6bn to the global economy through their production activities and expenditure on goods and services. This is more than the combined gross domestic product of Ecuador, Ghana and Tanzania, or close to half of the gross domestic product of countries such as South Africa or Denmark.

Whilst the potential for negative social and environmental impacts from gold mining activities is well known, the nature and distribution of the socio-economic impacts of gold mining at an industry level on host nations and communities is relatively poorly understood. Focusing on the impacts of large-scale commercial gold mining,ⁱ this report builds on previous studies commissioned by the World Gold Council to provide an understanding of the socio-economic impacts of the gold mining industry at a global, national and host community level. In doing so, this report seeks to facilitate more effective dialogue between companies, governments, citizens and civil society and contribute towards the development of policies and engagement activities that deliver shared value for all stakeholders.

The value created by the gold mining industry is becoming increasingly important for the socio-economic development of nations and communities

Responsibly undertaken, gold mining has the potential to make a significant, positive impact on the economies of the countries in which gold mining takes place and on the lives of the citizens of those countries. Amongst the top 30 gold

producing countries, over 60% are low or lower-middle income countries with substantial socio-economic development needs. In eight of the top 30 gold producing countries, the production and procurement activities of gold mining companies generate over 10% of each country's gross domestic product. For two of these countries, this figure rises to over 25% of gross domestic product.

Many of the countries that are significant gold producers are also impoverished countries that are long term recipients of development assistance (aid) from foreign government donors. Given that reliance on foreign aid is an inherently vulnerable position for any impoverished country, it is notable that the economic value directly and indirectly created by the gold mining industry globally has exceeded the global total value of development assistance every year since 2010.

ⁱ It is recognised that in several gold producing countries the socio-economic impacts of artisanal and small-scale gold mining are significant, particularly for local communities. However the need for data transparency and consistency has dictated that this report focuses solely on larger-scale, corporate gold mining activities, primarily undertaken by listed companies. These gold mining activities represent the majority of gold extraction globally.

Perhaps more importantly, given cuts to aid budgets in many donor countries, the longer term trend for the economic value created by the gold mining industry is that of significant growth. The direct economic contribution of the gold mining industry to the global economy, as defined by 'gross value added' (GVA), has increased almost seven-fold in the period from 2000 to 2013. The world regions that have benefited most from the growth in the value created by gold mining are Asia and Africa, which account for the largest shares of gold mining GVA. Amongst several of the lower income gold producing countries, such as Ghana and Mali, growth of the gold mining industry means that gold mining companies now create substantially more value in the economy than is received from development assistance programmes. For Ghana and Mali this was not the case as recently as 2008.

The economies of gold producing countries gain far more value from the productive activities of gold mining companies than they do from royalties on land use

Naturally, governments of gold producing countries want to maximise the value that they receive from the mining companies that develop their resources. Much of the literature on this topic suggests that royalty rates on mineral extraction are the principal economic benefit for governments. However, an analysis of gold mining company expenditures reveals that far more value is distributed to host governments and the wider economy through other means.

By far the most significant means by which value flows from gold mining companies to the economies of host countries is through payments to suppliers and contractors and wages for employees. Together these two areas, usually taxed by

70% of total expenditures by gold mining companies



are on payments to suppliers, contractors and employees.

governments, account for 70% of total expenditures by gold mining companies. In terms of direct taxation, almost 60% of the payments that gold mining companies make to host governments are for income and corporate taxes. Royalty rates, by contrast, account for around 15% on average of direct taxation. Other taxes that can be almost as significant as royalty payments include import or fuel duties – for some mining companies fuel costs may account for up to 40% of total operating expenses, so such duties can be significant.

Societal benefit from the revenues created by gold mining depends upon responsible host governments – and there is evidence that revenue management in gold-producing developing countries is improving

Arguably the most well documented challenge facing resource-rich developing countries is the management of revenues from the extractive industries. Governments, especially in poorer countries, are not always open about the revenues they receive from extractive industries which has an impact on the ability of their citizens to hold them to account. A key initiative designed to help improve the accountability of governments is the Extractive Industries Transparency Initiative (EITI), which provides a mechanism for host governments to publicly disclose the revenues raised and received from extractives companies. The gold mining industry is an active supporter of the EITI as are many gold producing countries: 70% of the developing countries within the top 30 gold producing countries have implemented the EITI and over 20 international gold mining companies support the administration of the initiative.

One of the objectives of transparency initiatives such as the EITI is to reduce corruption risk, a significant factor in the misuse of revenues from extractive industries. In gold producing countries, this appears to be working. An analysis of eight gold producing countries that have implemented the EITI shows a positive correlation between growth in the economic contribution of large-scale commercial gold mining and a reduction in corruption. Clearly there are other factors beyond EITI implementation that drive reductions in corruption. Nonetheless, this trend illustrates how responsible gold mining companies, working in partnership with governments, civil society and other stakeholders, can contribute towards improvements in host country governance.



One of the objectives of transparency initiatives such as the EITI is to reduce corruption risk, a significant factor in the misuse of revenues from extractive industries. In gold producing countries, this appears to be working.



Globally, gold mining companies directly employed over one million people in 2013, with over three million more people employed as a result of the industry's procurement activities.

Responsible gold mining companies can be important job creators for host communities and employment stimuli for local economies

Managing the expectations of host communities on the numbers of people that a mining operation will employ can be a significant challenge for companies, given the capital intensive nature of gold mining. Globally, gold mining companies directly employed over one million people in 2013, with over three million more people employed as a result of the industry's procurement activities.ⁱⁱ Nonetheless, the gold mining industry simply does not employ the same number of workers as other sectors, such as manufacturing. What it does do, however, is provide high value employment.

Gold mine employees consistently earn more than the local average and in less developed economies considerably more. This is an important trend because in less developed economies each worker will usually support a higher number of dependants than in more developed economies. In Mali a study found that each gold mine worker supported six dependants. In addition to receiving relatively high salaries, employees also benefit from the investments that companies make in skills development and training of their workforces.

Moreover, gold mining companies are relatively successful at employing local people in their operations: in most regions over 90% of the employees at gold mining operations are local workers. For comparison, in the oil and gas sector on average around 70% of the workforce are local workers.

In common with other segments of the extractive industries, gender diversity remains a challenge in the gold mining industry with companies reporting an average of around 10% of their workforce at mining operations being women. However, there is some evidence that, despite their low numbers, on average women employed at gold mining operations are earning more than men as a result of occupying higher skilled positions.

Gold mining companies can catalyse development projects for local communities

Securing the social licence to operate is a critical issue for the gold mining industry. The value of a company's assets below ground can only be realised if the social and political environment above ground enables production. In addition to being 'the right thing to do', the need to secure the social licence to operate means that gold mining companies, in common with other extractives industries, often invest heavily in improving the socio-economic conditions of host communities. In many cases, gold mining companies make targeted investments that focus on the same social or economic challenges that aid donors and national governments are also seeking to address.

Gold mining companies are relatively successful at employing local people in their operations:



in most regions over 90% of the employees at gold mining operations are local workers.

ⁱⁱ Employment figures are calculated utilising published industry data. It is recognised that the numbers of people employed in artisanal and small-scale gold mining can also be significant in some countries. However, as previously noted, the impacts of artisanal and small-scale mining are outside of the scope of this report.

For example, many gold mining companies focus significant resources in improving healthcare in local communities. Beyond the benefits such investments bring in terms of the social licence, investments in community healthcare can often help minimise absenteeism and reductions in productivity due to workforce illness. Health issues that are often prioritised by gold mining companies include HIV/AIDS, tuberculosis and malaria. In a significant number of gold producing countries, the growth of the gold mining industry over a ten-year period coincides with a reduction in the prevalence of these diseases. Whilst these improvements in disease control cannot be solely attributed to the gold mining industry, the industry investments in community healthcare will have made an important contribution.

Moreover, a key benefit that gold mining companies can bring to investments in community healthcare is the ability to finance healthcare interventions that may be beyond the resources of most aid programmes due to cost or technical investment requirements. The existence of a business case for addressing a community health issue can provide an entirely different perspective on how a programme is funded compared to the approaches that aid agencies must take.

For the development potential of the gold mining industry to be realised, stakeholders will need to work together in partnership

Whilst many communities are benefiting from responsible gold mining, there are others where there are disputes and even conflict between mining companies and other stakeholders. Undoubtedly, gold mining companies bear a burden of responsibility to ensure that their presence in a community and country results in socio-economic benefits.

During this year, 2015, the global community of the United Nations is developing a new set of Sustainable Development Goals (SDGs) that include an unprecedented focus on the role of business. It is, therefore, timely to focus on the role that the gold mining industry can play as a development partner.

This report shows that responsible gold mining companies can create many benefits for host communities and governments in gold producing countries. However, there remain very significant challenges that the gold mining industry cannot address alone. Partnerships are key. Considering gold mining companies as development partners for gold producing countries would represent a major shift from the conventional, more transactional type of relationship that currently exists between many industry, government and community stakeholders, and a major milestone in the journey towards sustainable socio-economic development.

Finally, this research found some deficiencies in the data available on the socio-economic impacts of gold mining. Addressing these deficiencies would be of significant benefit to all stakeholders working on understanding, improving or making the most of the socio-economic impacts of the gold mining industry.

Introduction

In recent years there has been increasing recognition of the role that the extractive industries can play in supporting sustainable socio-economic development. Multilateral institutions such as the World Bank, donor agencies such as the United States Agency for International Development (USAID) and the UK's Department for International Development, civil society organisations such as CARE International and Building Markets, and policy think-tanks such as the Africa Progress Panel all recognise the significant contributions that the sector can make to improving peoples' lives, often in some of the world's poorest regions. As one of the key segments of the broader extractives sector, the gold mining industry has the potential to make a significant, positive impact on the economies of the countries in which gold mining takes place and on the lives of the citizens of those countries.

There are challenges, however. The potential for negative social and environmental impacts from the extractive industries is well known. At the same time, the nature and distribution of the socio-economic contributions that mining can make to host nations and communities is relatively poorly understood. This creates a challenge that hinders effective dialogue between companies, governments, citizens and civil society and impedes the development of policies and engagement activities that create shared value for all stakeholders.

The World Gold Council has been working to address this gap and has commissioned a number of reports analysing the socio-economic impacts of gold mining. Two reports have been produced analysing the impacts of gold mining on the economy of one important gold-producing country, Peru. The *Responsible mining and value distribution* series of reports provides valuable data on the socio-economic contributions of World Gold Council member companies. The 2013 report *The direct economic impact of gold* by PwC provided baseline figures indicating the economic impacts of the gold supply chain on the world's major gold producing and consuming countries.

The nature and distribution of the socio-economic contributions that mining can make to host nations and communities is poorly understood.



This report builds on these previous studies by examining the socio-economic impacts of the commercial gold mining industry at both a global, national and host community level. As such, this report aims to help improve the understanding of all stakeholders on the overall socio-economic impact of the gold mining industry on the global economy, on the contributions it makes to the economies of gold producing countries – particularly those that have developing economies – and on the contributions it makes to the lives of people in host communities. In doing so, this report seeks to facilitate better understanding and more effective dialogue between all stakeholders.

Report structure

The impacts of the gold mining industry are explored in this report through four themes:

- **Supporting global economic growth:** Analyses the global scale of the gold mining industry and its patterns of growth.
- **Supporting host nations:** Analyses the economic contributions of the industry in gold producing countries, including how value is distributed from the industry and its role in supporting effective governance of mineral revenues.
- **Investing in people:** Analyses the nature and extent of job creation by the gold mining industry, discusses some key challenges and how the industry is responding.
- **Supporting communities:** Discusses why companies need to invest in ensuring that communities share in the value created by the gold mining industry and analyses how the industry is doing this.



The scope of this report is limited to the impacts of larger scale gold mining. Artisanal and small-scale (ASM) gold miners can play a significant role in many local economies and communities, but reliable data on the socio-economic impacts of artisanal gold production is not currently available.

Scope and approach

The scope of this report is limited to the impacts of larger scale, corporate gold mining activities, primarily undertaken by listed companies. The reason for this is twofold. Firstly, such activities represent the majority of physical gold extraction. Secondly, the analysis for this study required access to reliable and comparable data sources, much of which has been derived from the reports that corporate gold mining companies are obliged to provide to investors, regulators and other stakeholders.

It is recognised that, in several developing countries, artisanal and small-scale (ASM) gold miners can play a significant role in local economies and communities. However, reliable and comparable data on the socio-economic impacts of artisanal gold production across different gold producing countries is not currently available. The nature of the socio-economic impacts of ASM is also quite different to that of larger-scale commercial operations which further hinders attempts at comparison.

Throughout this report, all references to the gold mining industry or to gold mining companies refer solely to larger scale, corporate and publicly listed companies.

No primary research has been undertaken for this report, which relies on secondary data sources. Key data sources included:

- Industry data providers, such as GFMS, Thomson Reuters and SNL Metals and Mining.
- Studies by mining industry bodies and associations, such as the World Gold Council, This is Gold, the International Council on Mining and Metals and national mining chambers.
- Multilateral organisations including the World Bank, the Organisation for Economic Co-operation and Development (OECD) and various bodies of the United Nations.
- Initiatives such as the Extractive Industries Transparency Initiative (EITI) and the Corruption Perceptions Index.
- Research studies from academia and advocacy organisations.
- Reports from companies, such as their corporate sustainability reports and annual reports.

The availability, quality and consistency of data vary significantly between sources, topics and geographies, with social data proving a particular challenge. Therefore, whilst best efforts have been used to obtain and utilise the most accurate and up-to-date data, readers should be mindful that the purpose of this report is to identify and analyse relevant industry-wide trends and themes rather than precisely quantify specific impacts.

Further details of the research methodology are provided in the Appendix.

Section 1: Supporting global economic growth

“Growth is not an end in itself. But it makes it possible to achieve other important objectives of individuals and societies. It can spare people en masse from poverty and drudgery. Nothing else ever has.”

The Commission on Growth and Development

- Globally, the gold mining industry directly contributed around US\$ 83.1bn to the global economy in 2013 – equivalent to the combined gross domestic product of Ghana and Tanzania.
- Once the indirect economic impact of the industry’s expenditure on goods and services in its supply chain is taken into account, this figure rises to US\$ 171.6bn – equivalent to almost half of the gross domestic product of South Africa.
- Gold mining is a growth industry – its direct economic contribution to the economy has increased almost seven-fold from 2000 to 2013.
- The growth in the economic impact of the gold mining industry has been most significant in Asia and Africa.
- The pattern of growth in the gold mining industry is mirrored by improvements in the income status of gold producing countries.

As a mineral, gold has always epitomised prosperity, and gold mining is amongst the world’s oldest forms of economic activity. Societal awareness and interest in gold as a metal is high yet, despite this, the role of the gold mining industry in supporting growth within the global economy is seldom discussed. Commentators tend to focus on the impact of mining industry as a whole, grouping gold production with other minerals such as iron ore or copper. However, whilst the absolute volumes of

gold produced from mining operations is dwarfed by those of other minerals, the value of gold means that the gold mining industry can make substantial contributions to the growth and prosperity of national and regional economies.

The scale of the industry’s economic contribution can be assessed by calculating the ‘gross value added’ (GVA) by gold mining. GVA is a calculation that estimates the contribution of industrial activity to a nation’s gross domestic product (GDP). It is important to note two points in relation to GVA:

- GVA is not the same as production; production statistics describe the physical volume of gold produced whereas GVA statistics (as used throughout this report) describe the economic value of gold output.
- GVA is not the same as profit; a company can generate substantial GVA within an economy and still be unprofitable.

Direct GVA estimates the economic value of the gold mining industry’s production to an economy. Indirect GVA estimates the value of economic production in associated sectors as a result of gold mining companies’ expenditures on raw materials, goods and services (the supply chain). Details of the study methodology, including GVA calculations, are provided in the Appendix.

Globally, the gold mining industry directly contributed around US\$83.1bn to the global economy in 2013; once the indirect economic impact is taken into account, this figure rises to

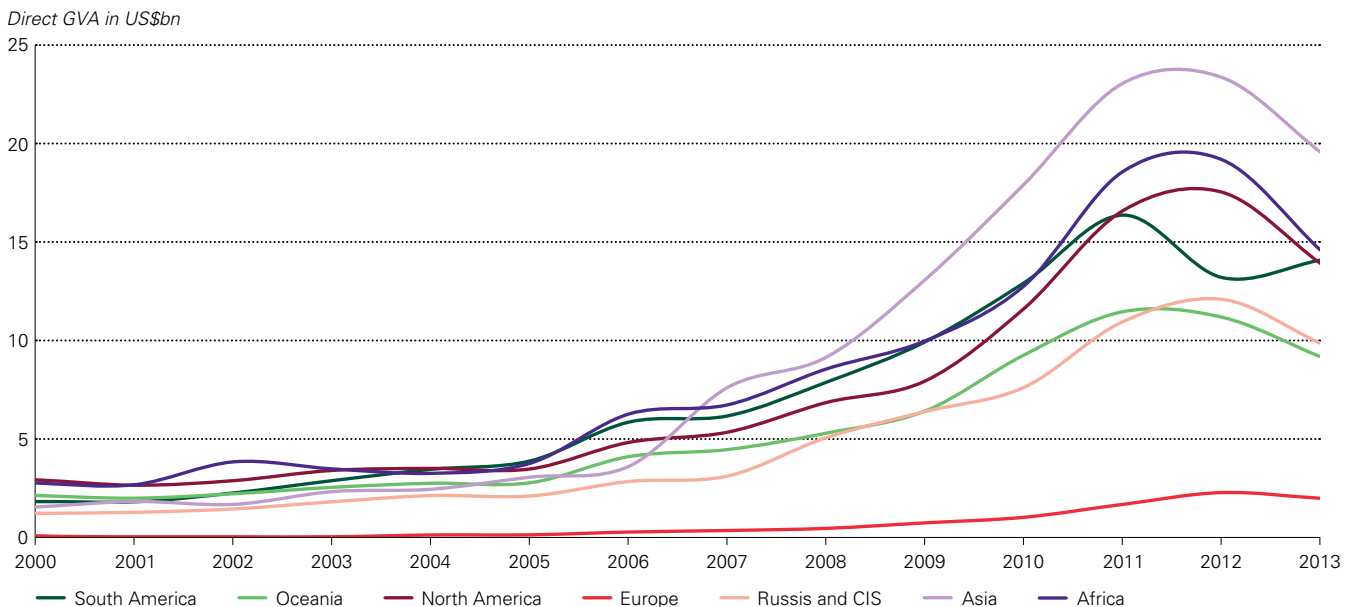


Chart 1 illustrates the global direct GVA contribution of the gold mining industry between 2000 and 2013, categorised by region. One of the most striking features of this graph is the rate of growth that the gold mining industry has experienced over this period, particularly following the post-2005 commodity boom. Between 2005 and 2012 the industry grew by over 400%, fuelled by both demand for gold and the rising gold price. From 2012 onwards most regions experienced a decline in the economic contribution of gold mining as a result of a decline of over 15% in the average annual gold price. In 2013 the industry contributed around 16% less to the global economy than it did in 2012, though still almost 14% more than in 2010. With an almost seven-fold increase in gold mining direct GVA from 2000 to 2013 the longer-term trend remains that of industry growth, despite the gold price movements of recent years.

Prior to 2005, differences between the GVA generated by gold mining in world regions was minimal. Following the onset of the commodities boom in 2005, the economies of Asia, followed by Africa and South America, were the largest beneficiaries of GVA from gold mining. North American GVA closely followed these regions.

South America experienced a notable drop in GVA in 2011; this illustrates the impact of Venezuela nationalising its gold industry in 2011. The nationalisation of the industry contributed to around a five-fold increase in industry operating costs between 2011 and 2012 and a corresponding impact on the value of that country's gold output and its contribution to the GVA for the region as a whole.

Chart 1: Direct GVA (US\$bn) of the global gold mining industry from 2000 to 2013



Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey*; GFMS, Thomson Reuters *Gold mine economic service*; The London Gold Market Fixing Limited (TLGMFL)

GVA
GVA GVA
GVA GVA GVA
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GVA GVA GVA GVA GVA
GVA GVA GVA GVA GVA GVA
2000-----2013



With an almost seven-fold increase in gold mining direct GVA from 2000 to 2013 the longer-term trend remains that of industry growth, despite the gold price movements of recent years.

Following the onset of the commodities boom in 2005, the economies of Asia and Africa, followed by South America, were the largest beneficiaries of GVA from gold mining.



The global economic impact of the industry more than doubles when both the direct and indirect GVA contributions of the gold mining industry are taken into account. This is illustrated by **Table 1**, which also illustrates how the price of gold affects the contribution that the gold mining industry makes to the economies of host countries; changes to the price of gold have clearly been central to the growth in the gold mining industry's economic contribution, though the increase in GVA exceeds the rise in the price of gold.

The economic contribution of the industry to the global economy has been growing fast over the last decade, and is now significant on a global scale. At around US\$171.6bn, the total economic contribution resulting from the gold mining industry and its supply chain to the global economy in 2013 was equivalent to over half the national output of South Africa, and just under 10% of the national output of Canada.

In addition to its growth, an important macro trend that can be observed is the shift in the geographical location of the gold mining industry's value creation activities from advanced to less developed economies. This is also true of the mining industry more broadly. Several centuries ago the locus of the world's mining industry was Europe. With the growth of the US economy in the 19th century the focus of mining activities moved across the Atlantic. In the latter part of the 20th century most mining took place south of the equator where Africa and South America host large amounts of untapped mineral reserves.¹

Gold mining has followed a similar trend. Whilst North America remains a significant region for gold mining activity, the majority of gold production is from regions with less advanced economies. This has important implications for economic development, as in smaller and less advanced economies the contributions of the gold mining industry will have a greater proportionate impact on national economies and therefore, potentially, also on the economic development of host nations.

Gold mining can be an important catalyst for development, but as other industry sectors develop the relative importance of gold mining declines as the economy diversifies. In China's case it is clear from the industry's significance in the domestic economy (illustrated by **Table 3**, page 13) that gold mining is not solely responsible for the country's emergence as a global economic power. Nonetheless, the role that China's gold mining industry has played in supporting development and driving high levels of economic growth should not be underestimated. The industry's contribution to national GDP has grown by 269% since 2007 and was estimated to be US\$11.98bn in 2013, more than double the size of Suriname's entire economy.

Table 1: Total global direct and indirect GVA of the global gold mining industry and annual average gold price

Year	Direct GVA (US\$bn)	Direct and indirect GVA (US\$bn)	Global annual average price (US\$ per ounce)
2000	12.2	25.2	279.1
2005	19.0	39.0	444.5
2010	73.1	150.3	1,224.5
2012	98.7	205.6	1,669.0
2013	83.1	171.6	1,411.2

Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey*; GFMS, Thomson Reuters *Gold mine economic service*; The London Gold Market Fixing Limited (TLGMFL)



An important macro trend that can be observed is the shift in the geographical location of the gold mining industry's value creation activities from advanced to less developed economies.

The role that gold mining plays in supporting economic development is illustrated by **Chart 2**. Focusing on a group of 47 countries that account for over 90% of global gold production, the chart shows how direct GVA from gold mining was distributed across economies of different income levels in 2003 and 2013. It can be seen that in 2003, 33 of these countries were classed as low or lower-middle income economies by the World Bank. 14 countries were classed as upper-middle or high income economies. By 2013, amongst that same group of countries, 26 were now classed as upper-middle or high income economies, and the number of low income economies had dropped from 16 in 2003 to five in 2013.

Whilst it would be misleading to claim that this improvement in national economies is a direct result of the growth of the gold mining industry, there is little doubt that the value created by the industry will have made an important contribution. For example, in 2007 China was classed as a lower-middle income economy and was the fourth-largest gold producing country, behind South Africa, the United States and Australia. In 2008, China became the world's largest gold producer, a position it maintains to this day. China reached upper-middle income status in 2010. Peru, the world's fifth-largest gold producer in 2013 was a lower-middle income country until 2008. Prior to 1995, Peru was not amongst the world's top 10 gold producing countries.²

Table 2 illustrates the distribution of direct and indirect GVA from gold mining across different world regions. It can be seen that in 2013 the economies in Asia were the greatest recipients of the value generated by gold mining, with just over US\$39bn being generated by the industry and its suppliers. Africa was the second-largest regional recipient, with almost US\$35bn flowing into African economies from gold mining activities. The table also illustrates how the 'multiplier effect' can impact the total amount of value created in a region; the direct GVA from

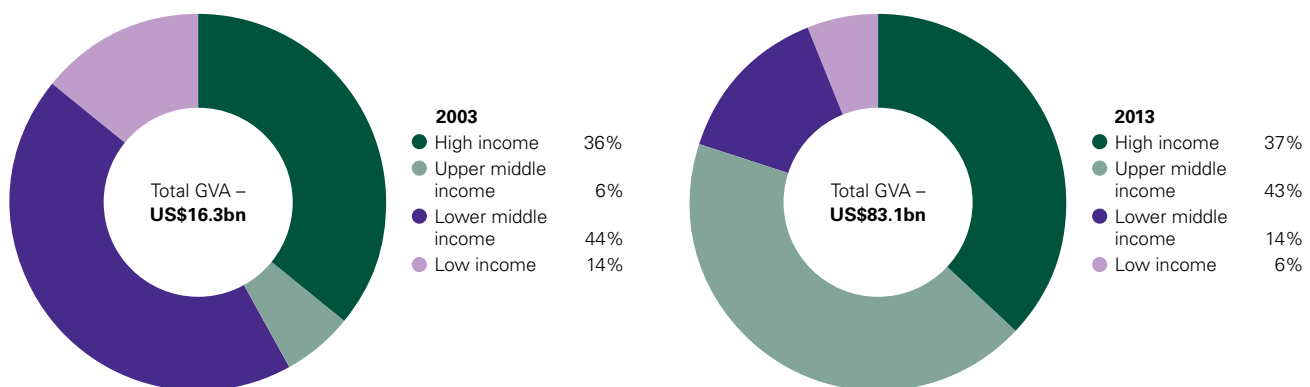
gold mining in Africa was only fractionally higher than in South America, however the total economic contribution once indirect contributions are taken into account is substantially higher in Africa than in South America. This is likely to be because of the benefits indirectly derived from gold mining in a more developed and diversified economy will be proportionally smaller than in a less developed economy. For example, a new mine opening in Tanzania is likely to have a greater impact in terms of stimulating the creation of business services that didn't previously exist, than the same sized mine opening in USA where most of the businesses that would service the mine probably already exist. However caution is needed in drawing too firm a conclusion due to the limited numbers of studies that have evaluated regional economic multipliers.ⁱⁱⁱ

Table 2: Regional distribution of direct and indirect GVA from gold mining in 2013

Total direct and indirect GVA (US\$bn)	Direct	Indirect	Total
Asia	19.6	19.6	39.1
Africa	14.6	20.3	34.9
North America	13.9	15.3	29.2
South America	14.1	11.3	25.3
Russia and CIS	9.8	9.9	19.7
Oceania	9.2	10.1	19.2
Europe	2.0	2.2	4.1
Global	83.1	88.6	171.6

Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey*; GFMS, Thomson Reuters *Gold mine economic service*; The London Gold Market Fixing Limited (TLGMFL)

Chart 2: Changes in income status between 2003 and 2013 amongst the same group of gold producing countries



Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey*; GFMS, Thomson Reuters *Gold mine economic service*; The London Gold Market Fixing Limited (TLGMFL). Income classifications are from the World Bank. Total direct GVA figures illustrated are for global production

iii Details of the multipliers used in this analysis are provided in the Appendix.

Section 2: Supporting host nations

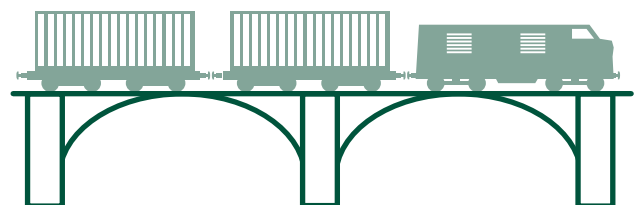
“Defying the predictions of those who believe that Africa is gripped by a ‘resource curse’, many resource-rich countries have sustained high growth and improved their citizens’ daily lives.”

Kofi Annan, former UN Secretary-General (1997-2006)

- The largest gold producing countries are those with more advanced economies, but industry growth is increasingly focused on developing countries where the gold mining industry is proportionately more influential in national economies.
- Amongst the top 30 gold producing countries, over 60% are low or lower-middle income countries with substantial socio-economic development needs.
- Many of the gold producing countries with the least developed economies are significant recipients of foreign aid – in some of these countries the value of the economic contribution of the gold mining industry has now overtaken the value of foreign aid received; in all countries industry growth far exceeds growth in the value of foreign aid.
- Payments to suppliers and employees account for 70% of the value that gold mining companies distribute within an economy – and host government treasuries collect far more revenue from income and employment taxation than they do from royalties.
- There is a positive correlation between the growth of commercial gold mining in countries that have implemented the Extractive Industries Transparency Initiative and reductions in corruption.

2.1 Industry contributions to national economies

Soaring demand for resources is a potential windfall for all resource-driven countries, but particularly for low- and lower-middle income economies. Mines have a long operating life; typically around 30 to 40 years. Revenues from mining can enable investments in food security, healthcare, education, infrastructure and economic diversification, thus ensuring that the development of finite mineral resources provides enduring benefits to host nations. Utilising mining revenues for such investments is primarily the responsibility of host governments. However companies also make significant investments, for example in infrastructure, which can have wider benefits for local communities beyond the life of the mine itself. In many cases significant investments in areas such as infrastructure are made by companies as part of the mine development process, prior to operations commencing.



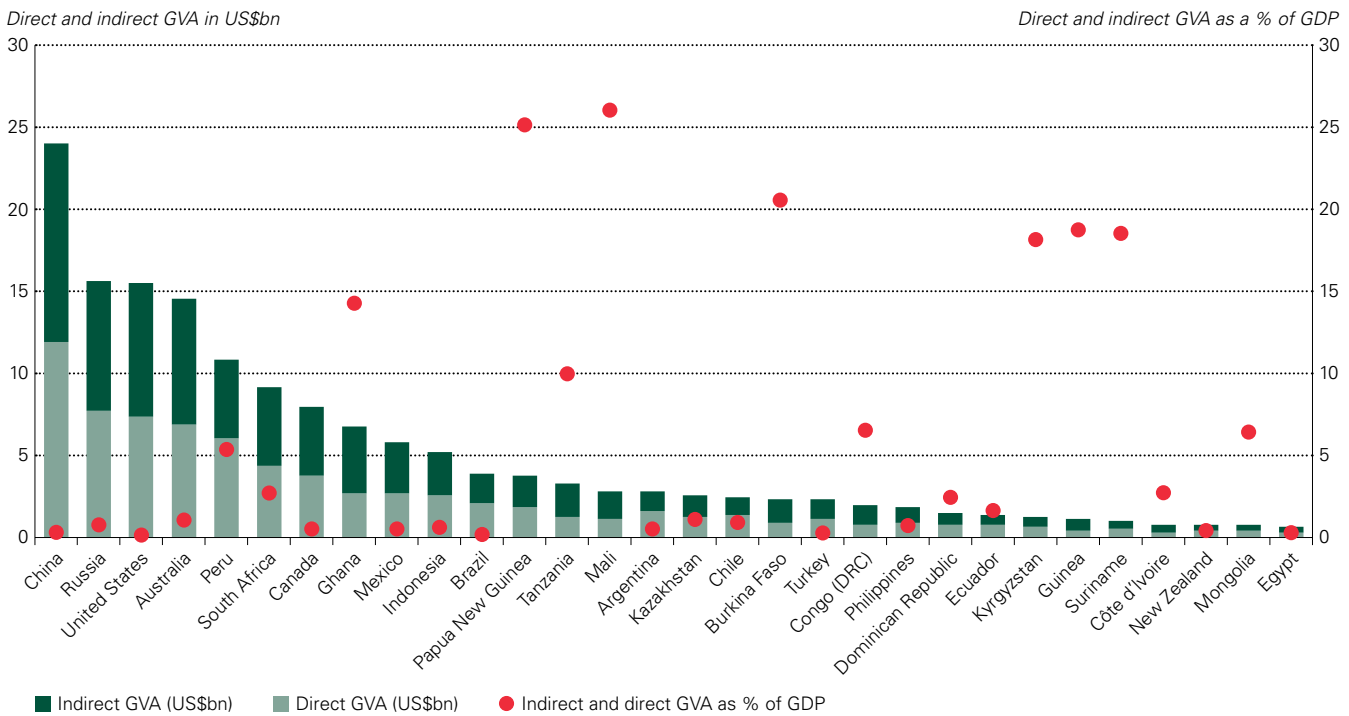
Companies also make significant investments, for example in infrastructure, which can have wider benefits for local communities beyond the life of the mine itself.

Whilst gold is seldom the only natural resource in a resource-driven country, it can nonetheless be significant. **Chart 3** shows the economic contribution that gold mining made to the economies of the top 30 gold producing countries in 2013,^{iv} providing both the value of the direct GVA from gold mining in each country, together with the proportion of GVA in each country's total GDP. Of these 30 countries, 23 are classed as having resource-driven economies.^v

It can be seen that China is the world's largest gold producing country, followed by Russia, the USA and Australia. In all of these countries, despite the value of the gold produced, the gold mining industry contributes considerably less than 1% to each

country's national economy. In the economy of the next largest gold producer, Peru, a country synonymous with gold mining since the time of the Incas, gold mining is more significant in the national economy but nevertheless remains the source of only 3% of the country's gross domestic product (GDP). This figure rises to over 5% once indirect impacts are taken into account. Amongst the top four gold producing nations in 2013, who between them accounted for over 40% of global gold production, gold mining directly contributes on average 0.25% of the national GDP; a figure that remains below 1% once indirect impacts are included.

Chart 3: Direct and indirect GVA from gold mining for the top 30 gold-producing countries in 2013, compared against the contribution of direct and indirect GVA to each country's national GDP



Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey*; GFMS, Thomson Reuters *Gold mine economic service*; The London Gold Market Fixing Limited (TLGMFL) and World Bank ^{vi}

iv The top 30 gold producing countries are categorised and ranked according to total direct and indirect GVA.

v Maxwell Stamp analysis based on a classification developed by McKinsey (2013). Note that the definition of resource-driven encompasses all minerals as well as oil and gas. None of the top 30 gold producing countries are defined as having resource-driven economies solely on the basis of gold mining.

vi The World Bank's GDP data is periodically updated. World Bank data used in this study was sourced in October 2014.

Amongst some of the smaller producers, however, the gold mining industry is more significant in the national economy, particularly once the indirect impact of gold mining companies' procurement is taken into account. In eight of the top 30 gold producing countries, the direct and indirect economic contributions of commercial gold mining companies generate over 10% of each country's gross domestic product. For two of these countries, this figure rises to over 25% of GDP.

In order to gain a clearer perspective of the industry's significance to national economies, **Table 3** compares the percentage of GVA in GDP produced directly from gold mining to other sectors in 10 of the top 30 gold-producing countries. In the table all value generated from mining activities, including gold production, is aggregated with other sub-sectors, namely construction, utilities and manufacturing, to constitute the industrial sector. Gold mining is also shown on its own as a sub-component so that its contribution relative to other sectors of the countries' economies can be seen.

As **Table 3** shows, despite being the largest gold producer China's gold mining activities form only a small proportion of the country's economy, contributing 0.2% to gross national production. The value created by gold mining accounts for 0.4% of the country's industrial production and is dwarfed by the value created in the agriculture and services sectors. However, amongst other top gold producers, such as Australia, South Africa and Peru, it can be seen that even though the value from gold mining is relatively modest when compared to the wider economy it is comparable to other sectors. For instance, South Africa's gold industry contributed 1.5% of GDP in 2012 but is around two-thirds the size of the nation's agriculture sector. Notably, the GVA produced by gold mining in Burkina Faso and Suriname constitute around 44% of the industrial sector in each country. In Mali it is around 76%. In Suriname's case the gold mining industry is one third the size of the domestic service sector and almost double its agricultural sector in terms of the value generated in 2012.

With the exception of Peru, every country where gold mining accounts for more than 1.5% of national GDP is a low or lower-middle income economy. All of these low or lower-middle income countries are also resource-driven economies. Globally, resource-driven economies are home to a disproportionately high number of the poor in the world; a recent study estimated that 69% of people in extreme poverty live in resource-driven economies.³ When considering the role of the gold mining industry in supporting development, it is useful therefore to draw comparisons with value of Official Development Assistance (ODA) programmes in these countries.

Table 3: Comparison of the direct GVA from gold mining with other sectors of the economy within key gold producing countries^{vii}

Country	Sectoral Value Added – 2012 (% of national GDP)			
	Agriculture	Services ¹	Industry ²	Gold mining ³
Mali	38%	32%	21%	16.0%
Suriname	8%	47%	35%	15.3%
Burkina Faso	33%	36%	25%	10.9%
Ghana	22%	47%	28%	8.3%
Kyrgyzstan	17%	48%	22%	6.0%
Peru	7%	51%	34%	4.0%
South Africa	2%	62%	26%	1.5%
Australia	2%	65%	26%	0.6%
Mexico	3%	58%	35%	0.3%
China	10%	45%	45%	0.2%

1 Including government, wholesale and retail trade, transport, financial and professional services.

2 Including mining, manufacturing, utilities and construction.

3 Gold mining is shown on its own as a sub-component of industry.

Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey*; GFMS, Thomson Reuters *Gold mine economic service*; The London Gold Market Fixing Limited (TLGMFL) and World Bank^{viii}



Amongst some of the smaller producing nations, the gold mining industry is very significant for the national economy, particularly once the indirect impact of gold mining companies' procurement is taken into account.

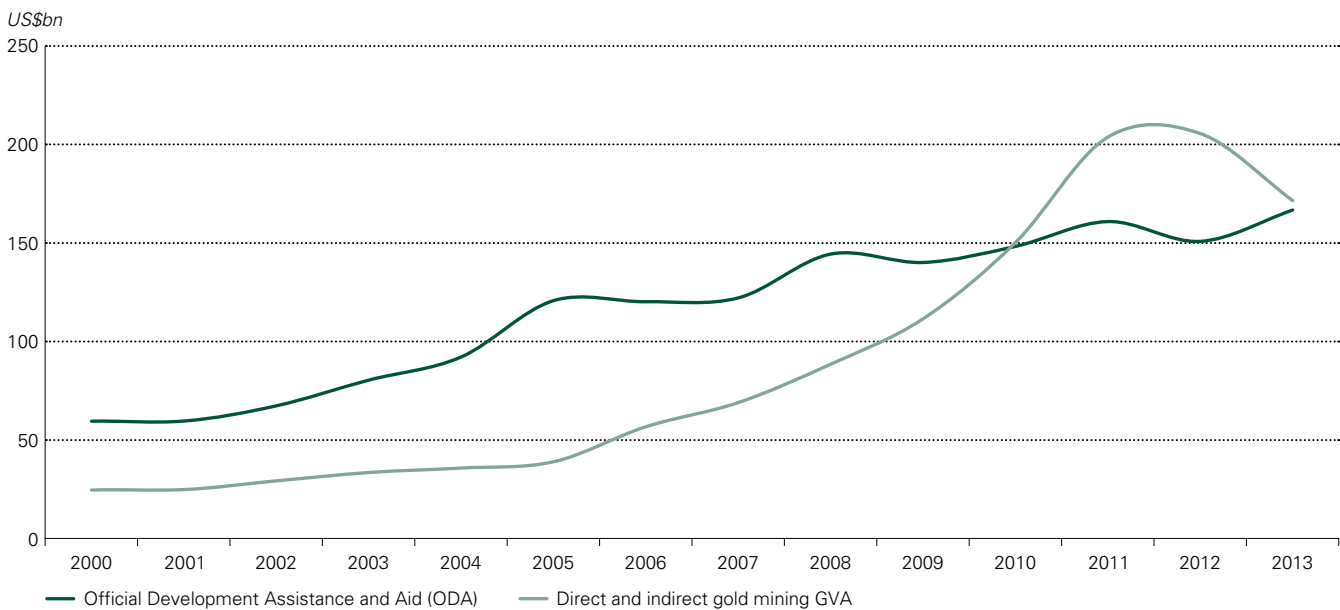
vii Note: Gold mining GVA is contained within the 'industry' GDP. For example, in Mali 21% of GDP is from industry. Gold mining GVA accounts for around 16% of GDP, so industry sectors other than gold mining account for only 5% of Mali's GDP. Gold mining therefore accounts for the majority of industry activity in Mali.

viii World Bank's GDP data is periodically updated. World Bank data used in this study was sourced in October 2014.

Chart 4 and **Table 4** illustrate the relative significance the gold mining industry plays in supporting the development of resource-rich countries. **Chart 4** compares the value of direct and indirect GVA generated by the global gold mining industry against the total value of ODA provided by developed countries to less developed countries from 2000 to 2013.

Whilst the amount of ODA has increased significantly since the turn of the century the rate of growth is relatively modest when compared to the rate of growth in the value generated by the gold mining industry. In 2000 the value directly and indirect generated by the gold mining industry was equivalent to around 40% of total ODA. However, from 2010 onwards the value generated by the gold mining industry has exceeded the total value of ODA every year.

Chart 4: Comparison of growth in global indirect and direct GVA from gold mining and Official Development Assistance (ODA) between 2000 and 2013



Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey*; GFMS, Thomson Reuters *Gold mine economic service*; The London Gold Market Fixing Limited (TLGMFL) and OECD

Table 4: Comparison of Official Development Assistance and direct GVA in selected resource-rich developing countries between 2000 and 2012

Country	Official Development Assistance (US\$m)			Direct GVA (US\$m)		
	2000	2012	Growth Rate (%)	2000	2012	Growth Rate (%)
Ghana	598.2	1,807.9	202%	273.0	3,476.4	1174%
Mali	288.0	1,001.3	248%	192.7	1,689.0	777%
Côte d'Ivoire*	160.5	2,635.6	1542%	17.0	464.0	2635%
Papua New Guinea	275.2	664.8	142%	371.5	2,252.2	506%
Tanzania	1,063.9	2,831.9	166%	87.6	1,690.9	1830%
Suriname*	23.9	39.6	66%	139.9	766.9	448%
Peru	396.8	393.8	-1%	942.2	7,800.7	728%
South Africa	486.4	106.7	-78%	1,837.5	5,562.1	203%
Indonesia	1,653.0	67.8	-96%	756.9	2,852.4	277%
Kyrgyzstan	214.7	472.9	120%	100.5	382.1	280%

*Figures relate to the period 2004 to 2012.

Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey*; GFMS, Thomson Reuters *Gold mine economic service*; The London Gold Market Fixing Limited (TLGMFL) and World Bank



Recently some governments have started to see extractives companies as potential partners in development.

Many impoverished resource-rich countries have long had a significant reliance upon foreign aid, which is an inherently vulnerable position. The only solution to dependency on foreign aid is economic growth. **Table 4**, on page 14 provides a closer examination of the amount of ODA received by selected countries and the value added by their gold mining industries. Apart from a handful of countries which experienced negative growth, the amount of ODA has more than doubled for most countries, with the exception of Suriname, from 2000 to 2012. The fact that ODA has grown in seven out of the ten countries is a good indicator of enduring human development challenges in these countries. The rate of ODA growth is dwarfed, however, by the rate of growth in the economic value of gold mining in each country. For example in Ghana, ODA grew by over 200% over 13 years, whereas the value of gold mining GVA grew by over 1,170%. Notably, the value of gold mining GVA in 2012 was significantly higher than the value of ODA for the majority of countries shown in **Table 4**. In Papua New Guinea, the economic contribution from gold mining in 2012 was around US\$ 2.3bn, whereas the value of ODA was close to US\$ 0.7bn. Clearly, the gold mining industry has the potential to play a very significant role in supporting socio-economic development in impoverished countries.

2.2 Supporting better governance

If governments in low and low-middle income countries use their endowments from resource industries such as gold mining wisely, they have the potential to transform their economies and the lives of their citizens. Similarly, gold mining companies operating in these countries have the potential to catalyse transformative improvements in the lives of host communities.

In practice, however, the record of the extractives industries (both mining and oil and gas) is mixed. A study on the impact of the extractives industries in Africa found that whilst Tanzania reduced extreme poverty from 84% to 67% between 2000 and 2007 and Ghana reduced extreme poverty by one third

between the end of the 1990s and 2005, in Mali growth had no discernible effect.⁴ The International Council of Mining and Metals (ICMM)^{ix} has noted that at a local community level, mining projects have not always led to marked improvements in human and social development in the regions and countries in which they have operated, and are often associated with negative social, economic and environmental impacts. In the absence of appropriate governance or adequate attention to the management of project impacts, the negative effects of mining may undermine any positive development outcomes, or such positive opportunities may remain unrealised.⁵

The primary responsibility for ensuring that mining developments create positive socio-economic benefits for host nations rests with national governments. This, however, does not dilute the responsibilities of companies to work as responsible and proactive partners of national governments.

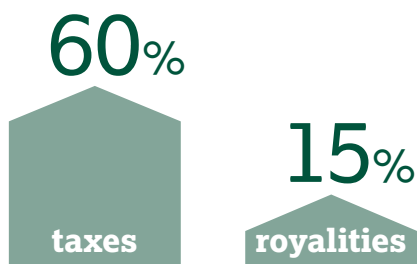
Governments and the extractive industries have often found themselves in antagonistic relationships as both have tried to defend their interests. Recently, however, some governments have started to see extractives companies as potential partners in development. A good example of this is the African Mining Vision which highlights the central role that mining can and should play in unleashing the development potential of host nations.⁶

Sources of value distribution from gold mining

One of the most important roles for mining companies as partners in development is that of value creator: generating the financial resources that governments can invest in developing their countries. Naturally, governments want to maximise the value they receive from mining companies investing in their countries. Much of the literature on the economic contributions of mining to host countries focuses on the royalty rates that governments levy on mineral extraction as the primary economic benefit. However, an analysis of gold mining company expenditures reveals that far more value is distributed through other means.

One of the most important roles for mining companies as partners in development is that of value creator: generating the financial resources that governments can invest in developing their countries.

ix The International Council on Mining and Metals (ICMM) is membership organisation of 21 mining and metals companies as well as 35 national and regional mining associations and global commodity associations that works to address sustainable development issues for the sector: www.icmm.com



Income and other corporate taxes account for almost 60% of direct payments to governments, compared to 15% from royalties and land use payments.

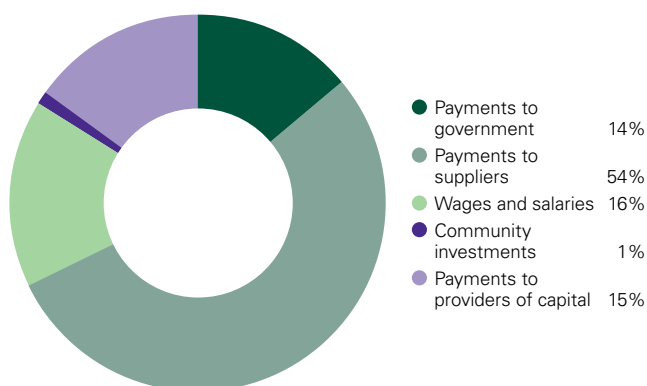
Chart 5 provides a breakdown of the 2013 in-country expenditures of the top 22 global mining companies. The operations for which this data has been reported together account for around 30% of global gold production in 2013. It can be seen that by far the most significant area of value distribution is in payments that mining companies make to their suppliers, followed by payments to their employees. Together, these two areas account for almost 70% of the total economic value distributed by gold mining companies. By contrast direct payments to governments, which includes both taxation and royalties, account for 14% of total expenditures. This is similar to the payments that are made to providers of capital.

Focusing specifically on payments to governments, **Chart 6** further illustrates the diversity of mechanisms by which host governments receive direct payments from gold mining companies. It can be seen that income and other corporate taxes account for over almost 60% of companies' payments to governments, compared to 15% from royalties and land use payments.

As **Chart 6** illustrates, there is also a significant category of 'other' payments made to government that are not royalties or direct taxation. Included within this category are taxes such as import or fuel duties, as well as certain categories of dividend payments to governments. For example, fuel costs are one of the largest single contributors to the operating costs of a mine, accounting for up to 40% of total operating expenses in some instances,⁷ so taxes on fuel can form a significant element of the payments that mining companies make to governments in certain jurisdictions. In addition to the direct payments that companies make to governments, it is worth noting that in most instances governments will be raising revenues indirectly through companies' payments to suppliers and employees, for example through Value Added Tax and employee income tax.

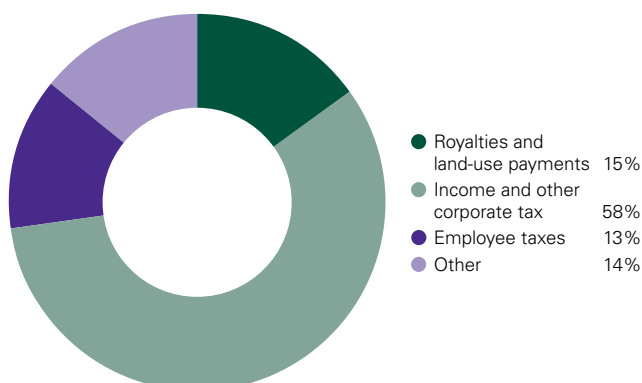
For regulators who are working to maximise the benefits host governments gain from mining activities, this highlights the importance of considering all of the different mechanisms by which value can be captured when, for example, modifications to taxation regimes are being considered.

Chart 5: In-country recipients of value distributed by the top 22 gold mining companies in 2013



Source: Maxwell Stamp analysis based on World Gold Council *Responsible gold mining and value distribution survey*, This is Gold survey, and company financial accounts

Chart 6: Average composition of the direct payments made to host governments by the top 21^x gold mining companies in 2013



Source: Maxwell Stamp analysis based on World Gold Council *Responsible gold mining and value distribution survey*, This is Gold survey, and company financial accounts. Data was available for the majority, but not 100%, of the selected companies' operations

^x Due to variances in company reporting it was not possible to obtain the data presented in Chart 6 for one of the top 22 gold mining companies included within the analysis presented in Chart 5.

The challenge of revenue management

Arguably the most well documented challenge facing resource-rich developing countries is the management of revenues from the extractive industries. The often intertwined issues of how royalty rates and taxations rules are established and implemented, and the prevalence in many poor countries of endemic corruption, mean that governments have frequently been opaque about the revenues that are collected from the extractive industries. This impacts the ability of the citizens of resource-rich countries to understand what benefits their countries gain from the extractive industries and to hold their governments to account on how those revenues are spent. For example, as Paul Collier, Co-Director of the Centre for the Study of African Economies at Oxford University has pointed out, the Democratic Republic of Congo (DRC) reported that it received only US\$86,000 in mineral royalties in 2006.⁸

A key initiative designed to tackle this challenge is the Extractive Industries Transparency Initiative (EITI). Further details are provided in **Box 1**. Whilst this initiative is not exclusive to the gold mining industry, many gold mining companies are active supporters of this initiative which provides a mechanism for citizens of a resource-rich country, and any other interested

stakeholders, to understand what revenues extractive industry companies have paid to national governments and what national governments have received.

The EITI was established to provide a mechanism that would provide a 'level playing field' for the disclosure of the revenues that are paid to governments by extractive industries, and is part of a movement towards revenue transparency in the extractive industries involving governments, companies and campaigners. The origins of the push for revenue transparency are in the late 1990s, when campaigning non-governmental organisations (NGOs) such as Global Witness began raising awareness on how the lack of transparency over financial payments made by extractive companies to governments in host countries aided and abetted the mismanagement and embezzlement of these revenues by in-country elite groups.

There is strong evidence that this initiative is having a positive impact on revenue reporting in resource-rich countries, with the DRC providing a good case in point. The DRC began implementing the EITI in 2008. The DRC's most recent EITI report, which is for 2011, reports that the DRC government received US\$1.4bn in payments from extractives companies.

Box 1: Extractive Industries Transparency Initiative

The Extractives Industries Transparency Initiative (EITI) is a multi-stakeholder initiative involving governments, companies and civil society organisations that works to enhance openness and accountability with regards to the revenues that governments receive from natural resources. Implementation of the EITI requires that both payments made by companies to a country's government and the revenues received by that government are regularly reconciled by an independent, credible administrator and published in an accessible and comprehensive report.

Despite some criticisms, since its launch in 2003 the EITI has evolved into a global rules-based standard with 44 implementing countries, 26 of whom have reached 'compliant' status. A number of EITI countries have enshrined the reporting requirements into law.

Whilst the EITI is implemented by national governments, it is publicly endorsed and supported financially and technically by over 90 extractives companies, 21 of whom are gold mining companies, and over 80 global investment institutions.

Gold-producing countries that have implemented the EITI are Burkina Faso, Côte d'Ivoire, Democratic Republic of Congo, Ghana, Guinea, Kyrgyzstan, Mali, Mongolia, Peru and Tanzania.

Source: Extractives Industry Transparency Initiative: <https://eiti.org/>

There is strong evidence that the Extractives Industries Transparency Initiative is having a positive impact on revenue reporting in resource-rich countries.

Key mining industry groups, notably the ICMM, have long supported revenue transparency as an important aspect of broader governance improvements in resource-rich countries. It is recognised by many companies, campaigners and governments that transparency over revenues that governments receive from extractive companies plays an important role in strengthening government macro-economic management, reducing corruption, empowering local communities and building trust. Transparent reporting also plays an important role in enhancing companies' accountability to their stakeholders, not least investors. ICMM released its first 'position statement' on revenue transparency in 2003 and a commitment towards revenue transparency and the EITI forms a key element of the requirements that mining company members of ICMM must publicly commit to and report against.⁹

Increasingly, revenue transparency is becoming a regulatory requirement for publicly listed extractives companies. In the United States, Canada and the European Union, regulations are either in place or going through the legislative process that require extractives companies to include, within their regulatory reporting, details of the payments that have been made to host governments. A key objective of these regulations is to ensure that transparency on payments made to governments is the norm, and not just dependent upon host governments committing to initiatives such as the EITI or companies voluntarily reporting this information to their stakeholders.

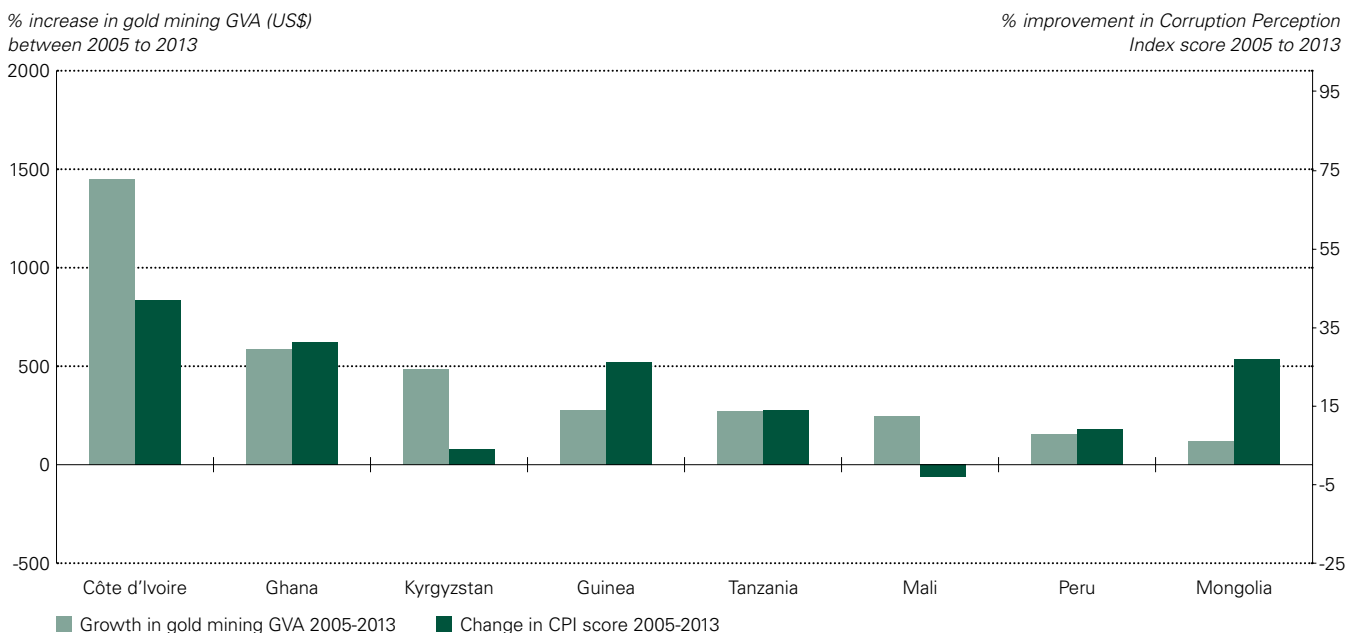
One of the primary objectives of the EITI is to provide a mechanism that helps address corruption. **Chart 7** provides an illustration of its impact. The chart shows eight of the 10 gold

producing countries that have implemented the EITI and for which data on gold mining GVA is available from 2005. It can be seen that all of these countries have experienced substantial growth in the economic contribution made by gold mining in their economies since 2005. Even in Mongolia, which has experienced the lowest rate of gold mining growth of these countries, the GVA from gold mining in 2013 was 115% higher than in 2005. The economic contribution that Côte d'Ivoire receives from gold mining has grown almost 15 times over in this eight year period which, in a country that still suffers from weak governance and a high level of corruption (Côte d'Ivoire was ranked 136 in the 2013 Corruption Perception Index), might be expected to 'add fuel to the fire' and make corruption worse. However, Côte d'Ivoire has improved its Corruption Perception Index score by 42% during the last eight years. Whilst clearly corruption remains a significant problem in Côte d'Ivoire, this data would suggest that at least as far as gold mining revenues are concerned, the EITI is having a positive impact, not least because the majority of other countries shown in **Chart 7** have experienced the same trend.

The only country shown by **Chart 7** where the CPI score has decreased is Mali. This is likely due to the long-running conflict between the government and Tuareg rebels in that country which has escalated over the time period covered by the chart.

Clearly there are other factors beyond EITI implementation that drive reductions in corruption. Nonetheless, the trends illustrated by **Chart 7** highlight the contribution that responsible gold mining companies, working in partnership with governments, civil society and other stakeholders, can make towards improvements in host country governance.

Chart 7: Direct GVA growth from gold mining between eight EITI implementing states and the relationship between this growth and the countries' scores on the Corruption Perception Index



Source: Maxwell Stamp analysis based on GFMS and Transparency International

Section 3: Investing in people

“People, wherever they are, want the opportunity to be financially independent, and to have the dignity of being able to provide for themselves and their family.”

The Rt Hon Justine Greening MP, UK Department for International Development

- Globally, gold mining directly employed over one million people in 2013, with over three million employed as a result of gold mining procurement activities.
- Gold mining jobs may not be as numerous as jobs in other industries, but they are high value – the apparel sector in India employs four times as many people as gold mining does globally, but generates less than 10% of the value generated by gold mining.
- Gold mining jobs consistently pay above-average wages – significantly above-average in less developed countries where each worker typically supports a high number of dependants.
- In most regions, over 90% of the employees at gold mining operations are local workers.
- Gold mining companies are working on improving gender equality of their workforces, though there remains considerable scope for improvement in this area.

3.1 Job creation

Investments in the health, knowledge, and skills of the people in a country – human capital – are as important as investments in the more visible, physical capital of the country.¹⁰ This is also an area in which citizens of resource-rich countries are becoming increasingly vociferous: they want jobs. Governments

are responding, often incorporating legal requirements on ‘local content’ – the proportion of the workforce that should be made up of nationals – into mining licences.^{xi} A recent study found that more than 90% of resource-driven economies have some form of local content regulation in place.¹¹

It is also a challenging issue for companies to respond to, as gold mining is highly capital intensive and, compared to other sectors such as manufacturing, does not require particularly large workforces in comparison to the capital value of a project. According to the United Nations Economic Commission for Africa, the manufacturing sector is 17.5 times more labour-intensive than the mining sector.¹² Expectations of mining job creation, both in terms of the numbers of jobs that will be created by a mining investment and the ability of those jobs to be fulfilled by nationals, can be at odds with the practical realities. For example, the Democratic Republic of Congo requires 96% of roles in the mining sector – and 98% of management positions – to be filled by nationals, but the requisite number of people with the necessary technical and managerial skills and experience are simply not available.¹³

Nonetheless, gold mining can still be a significant employer, particularly once the indirect impacts of job creation by suppliers to mining operations are considered. In addition to their core workforce, all mining operations will have significant requirements for suppliers to provide goods and services, for example construction, logistics, raw materials, catering, maintenance, accountancy and legal services.

xi Note: There is no standard definition of ‘local content’. The term is frequently applied to mean the procurement of goods and services locally, as well as the employment of locals within the workforce.

Table 5 estimates the total number of people employed by the gold mining industry in 2013, illustrating both the number of direct jobs (working directly for mining companies) and indirect jobs (working for suppliers to mining companies). The distribution of these jobs by region is also shown.^{xii}

Globally, commercial gold mining companies directly employed over one million people in 2013. When indirect employment created by mining companies' suppliers is included, the total number of jobs that result from commercial gold mining rises to around 4.2 million globally.

Perhaps unsurprisingly, the regional distribution of gold mining job creation mirrors regional production trends, with the greatest number of jobs being created in Asia, followed by Africa and South America. Whilst the number of studies of industry multiplier effects is limited (see the Appendix), the research that is available suggests that the multiplier impacts of job creation from gold mining are more pronounced in developing economies compared to advanced economies. In other words, for each job created by a gold mining company in Asia or Africa, there is a greater number of corresponding jobs indirectly created in the supply chain than there are for each job created by a gold mining company in North America. This is not particularly surprising, given that in Asia and Africa a supplier of, for example, construction services, is likely to utilise a higher proportion of manual labour than a construction services supplier in North America. But it is an important point to note when considering the job creation contributions of the gold mining industry, particularly in light of the industry's increasing focus on growth in developing countries. The multiplier impacts also highlight the role that mining can play in supporting the diversification of an economy in less developed countries.

Table 5: Direct and indirect employment in the gold mining industry in 2013

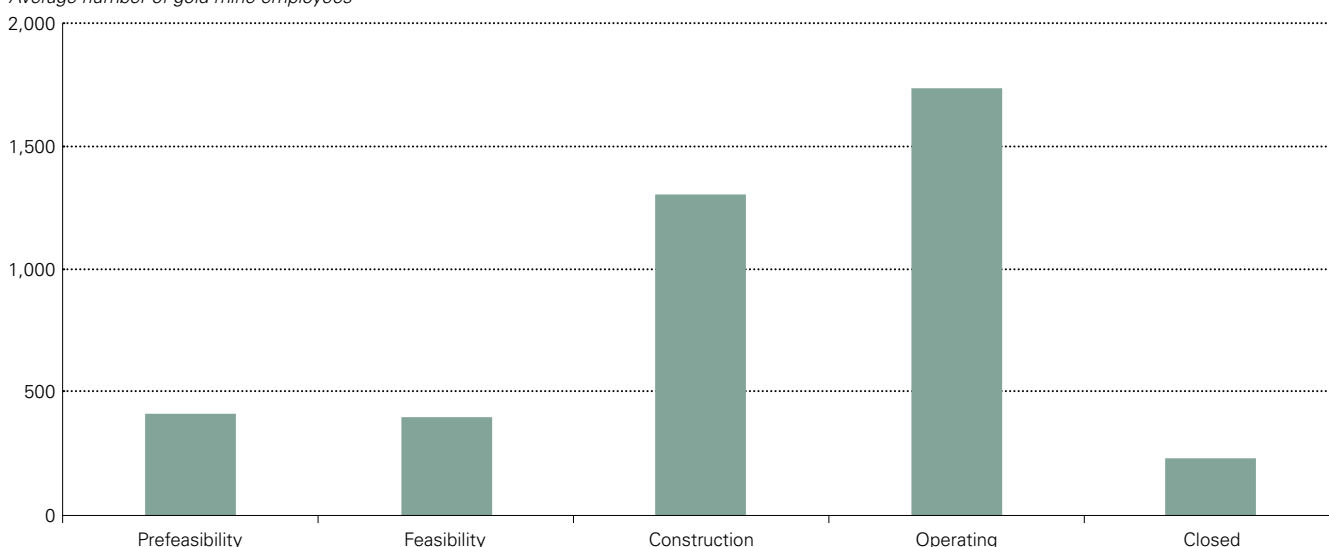
Region	Direct employment	Indirect employment
South America	140,000	398,000
Oceania	39,000	76,000
North America	66,000	127,000
Europe	8,000	15,000
Russia and CIS	67,000	183,000
Asia	414,000	1,132,000
Africa	308,000	1,241,000
Global total	1,042,000	3,172,000

Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey*; World Gold Council *Responsible gold mining and value distribution survey*; This is Gold survey, and company reports. (Data is rounded down to the nearest thousand)

The number of jobs created by gold mining varies at the different stages in a mine's life cycle. The average number of jobs created by an operating gold mine at these different stages is illustrated by **Chart 8**. It should be noted that there is considerable variation in the numbers of jobs created at different mines, driven by a wide variety of factors including the size and grade of the ore body and whether the mine is an underground or open pit mine. Nonetheless the overall trends hold true on a global basis. It can be seen that the most significant phase in terms of job creation is operation. It has been estimated that 75-90% of total mining expenditure is during the production phase. Development and construction, by comparison, accounts for around 10-25% of total expenditure.¹⁴

Chart 8: Average direct employment by an operating gold mine during key mine life-cycle phases

Average number of gold mine employees



Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey*

xii Note: At the time of writing employment data on China's gold mining industry was very limited. Consequently the employment numbers in Table 4 for Asia are likely to be a significant underestimate.

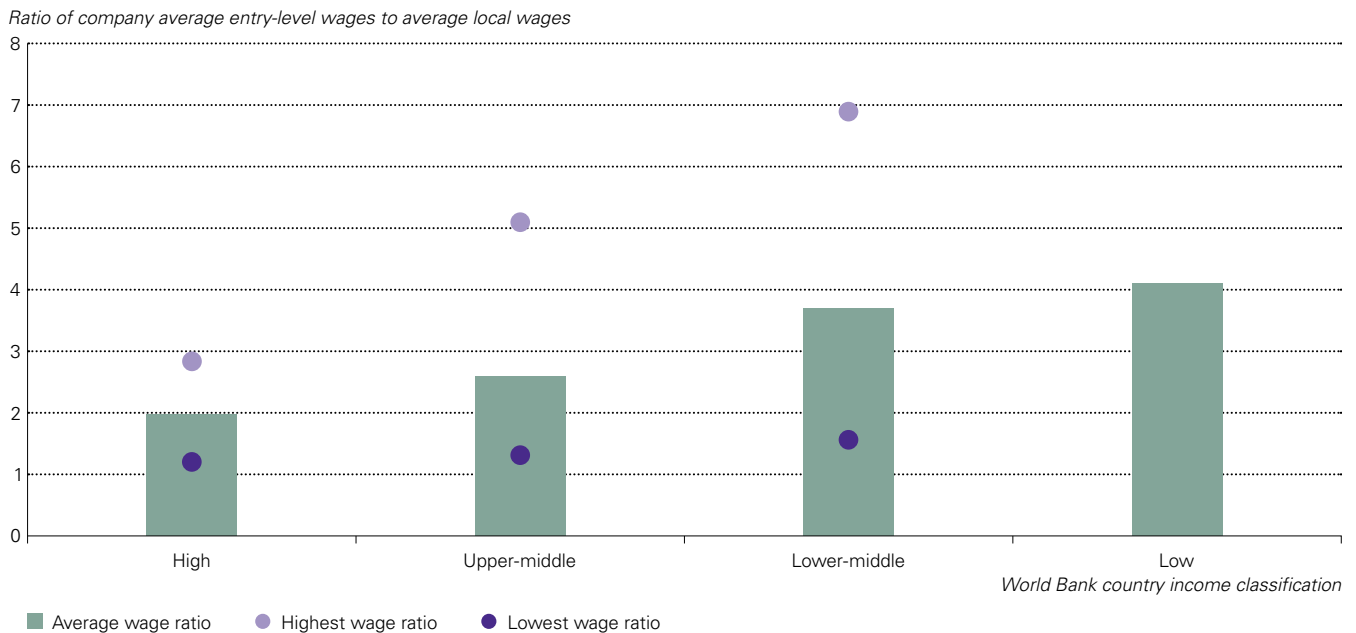
3.2 Employment income

The absolute numbers of jobs created by the development of the gold mining industry in a country is not insignificant, but compared to other less capital-intensive industries gold mining doesn't employ particularly large numbers of people compared to the value of its output. For comparison, the apparel sector in India employs around six million people, though it should also be noted that the economic value of the industry creating these six million jobs is less than 10% of the value of the gold mining industry with its 4.2 million jobs.¹⁵

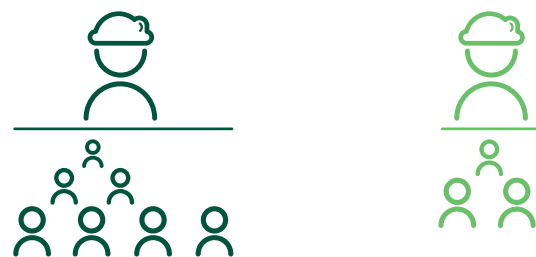
The high economic value of the gold mining industry is reflected in the income that gold mining employees earn. **Chart 9** illustrates the average wage ratio between the lowest paid

employees at companies' gold mining operations and local minimum wages (or typical wages, if there is no minimum wage defined by the government). It can be seen that, on average, gold mining companies pay significantly more than typical local wages, and that this differential increases in less developed economies. For example, in lower-middle income gold producing countries such as Côte d'Ivoire or Mongolia, the lowest paid mine worker will on average earn 3.5 times more than the typical local wage, and may earn almost seven times more. This is an important trend because in low income countries, each wage-earning worker usually supports a higher number of dependants than in higher income countries. For example, a study of the gold mining industry in Mali found that on average, each mine worker supported six dependants.¹⁶

Chart 9: Comparison of wage ratios between entry-level roles in gold mining companies and local typical or minimum wages



Source: Maxwell Stamp analysis based on company sustainability reports (Note: there was insufficient data to provide a highest and lowest ratio range for mines in low income countries)



low income country

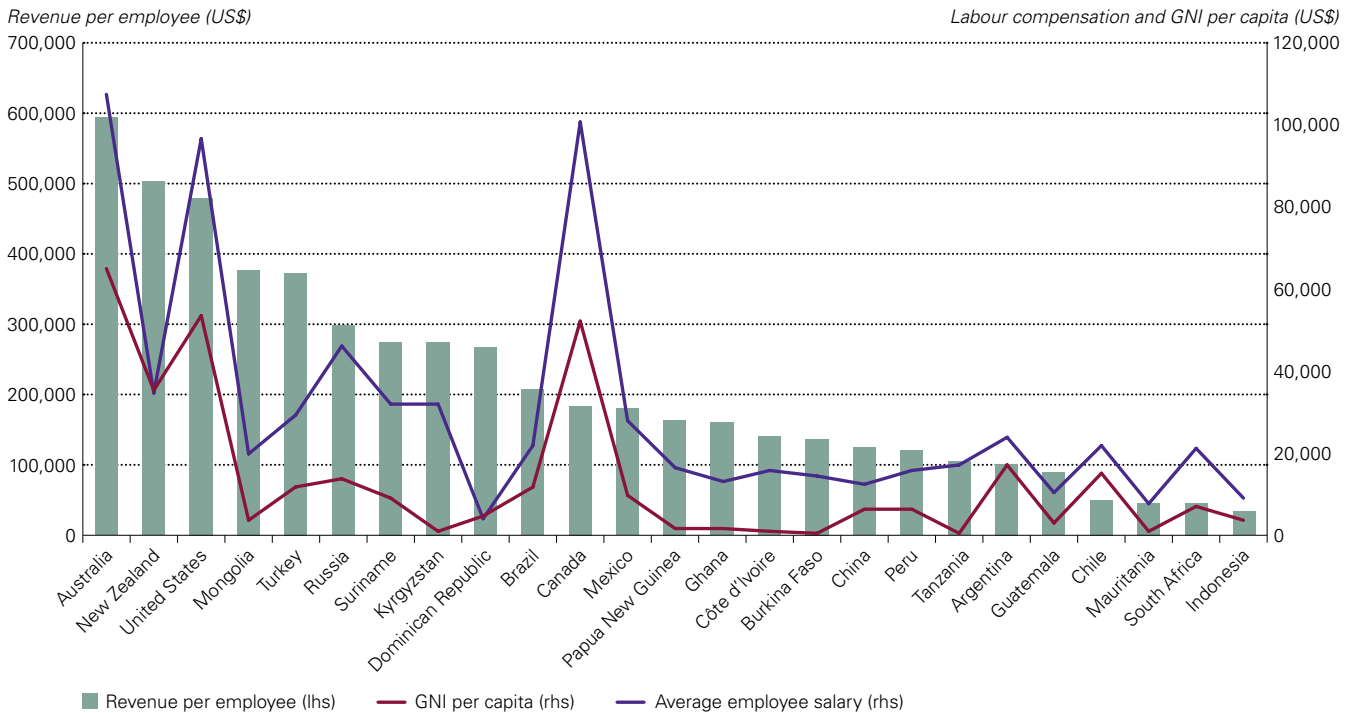
high income country

In low income countries, each wage-earning worker usually supports a higher number of dependants than in higher income countries.

The wage differential is further illustrated by **Chart 10** which shows the average gold mine employee wage compared to the average national wage for the top 25 gold producing countries in 2013. The chart also shows the average company revenue per employee in each country. It can be seen that average mine

worker salaries are consistently higher than the national average and also that, with one or two exceptions, the salaries paid to mine workers is relative to the average revenue per employee that the mining company receives.

Chart 10: Comparison of the average gold mine employee wage compared to the national average wage (gross national income per capita) for the key gold producing countries in 2013, together with average company revenue per employee



Source: Maxwell Stamp analysis based on World Gold Council *Responsible gold mining and value distribution survey*, This is Gold survey, World Bank and company reports



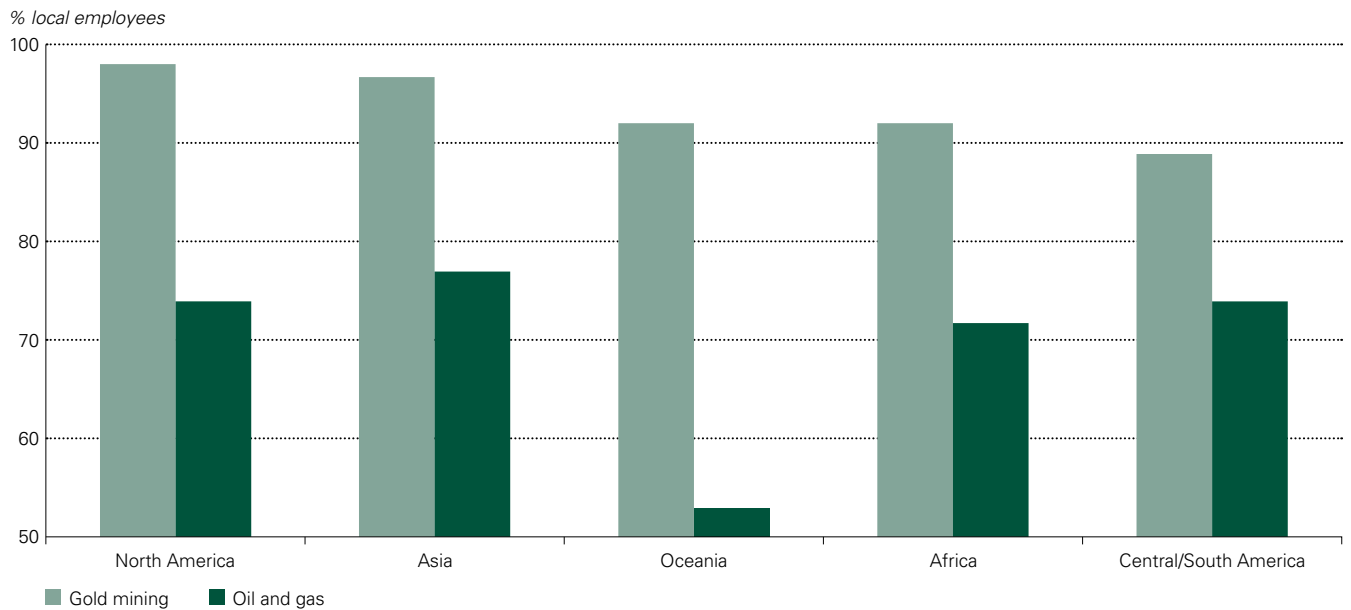
Average mine worker salaries are consistently higher than the national average.

3.3 Local employment

Of course, the potential socio-economic benefits of the relatively high incomes that mine workers earn would be of little benefit to host nations and communities if all the workers were expatriates. As noted above there is significant pressure on the gold mining industry (and other extractive industries) to demonstrate that local people are the beneficiaries of mining job creation. Data from companies' annual reports suggests that the gold mining industry is being quite successful in this area. **Chart 11** shows the average percentages of companies' workforces that are made up of local workers, with data on the oil and gas sector also provided as a comparison.

It can be seen that in most regions, over 90% of the employees at gold mining sites are local workers. Whilst there are some limitations and uncertainties with this data, such as no consistent industry definition for 'local' workers, the data nonetheless suggests that the citizens of gold producing countries are the main beneficiaries (at least in terms of employment numbers) of the above-average-wage-paying job creation impacts of gold mining. By comparison, in the oil and gas sector operations tend to employ a higher proportion of expatriate workers than in the gold mining industry. Clearly this differential is affected by differences between the two sectors in terms of both the skillsets required and the overall labour requirements; the oil and gas industry is no less focused on local content than the gold mining industry. Nonetheless **Chart 11** illustrates that there can be significant differences in the local employment opportunities created by different extractive industries.

Chart 11: Average percentage of gold mining operations workforces that are made up of local employees compared to the oil and gas sector



Source: Maxwell Stamp analysis based on company sustainability reports^{xiii} and *Hays/oil and gas job search*¹⁷

xiii Local employment data at an operational level was obtained from the 2013 sustainability reports of Acacia (formerly African Barrick Gold), Agnico Eagle Mines, Centerra Gold, Goldcorp, IAMGOLD, Kinross Gold Corporation, Newcrest Mining and Primero Mining Corporation.

Ensuring that local communities directly benefit from job creation opportunities is, and will remain, a critical issue for the gold mining industry. This issue is particularly pertinent as the industry increasingly seeks growth opportunities in remote, rural locations in low income countries, where local communities may lack the skills and expertise the gold mining companies need from their workforce and supply chain.

A related issue is that of inequality; both in terms of which individuals benefit from employment and who within a community benefits from mine workers' spending. In most instances the demand for employment within poor communities will exceed the number of jobs that are available. Similarly, research undertaken for the World Bank has found that the economic benefits created from mine workers' salaries are more likely to be captured by individuals within a community who are already relatively well-off within that community and have the capacity to respond to these new economic opportunities.¹⁸ This can be a source of resentment in communities affected by mining operations and in some instances can lead to conflict.

Issues of inequality can be challenging for companies to respond to, though there are steps that can be taken. Companies can build linkages within a local economy by seeking to maximise the procurement of goods and services from local suppliers through transparent and equitable purchasing procedures. Alongside this, companies can use their social investment activities to build capacity amongst local businesses that may need to develop in order to access the market

opportunities created by a mining operation or the spending of its workforce. Social investment activities can also be used to ensure that members of a community who may not be able to access economic benefits are able to gain other benefits from a mine's presence in their community, such as improvements in healthcare, infrastructure or environmental rehabilitation.

As an aside, the implications of population size should also be factored into considerations of the potential economic and human development benefits of gold mining job creation. The creation of 1,000 gold mining jobs in Mongolia (population c.three million) will make a greater proportional contribution towards national and human development than the same number of jobs in Indonesia (population c.250 million) as the benefits of this employment are shared amongst a far smaller group of people.

3.4 Gender equality

Perhaps even more of a challenge for gold mining companies than local employment is gender equality. Research studies by the World Bank and the International Finance Corporation have found that across the mining sector, women often miss out on the potential benefits the industry can bring and bear an unequal share of its burdens. Employment and income are largely captured by men, with formal unemployment rates for women in mining communities as high as 90%. Simultaneously, the environmental and social risks of mining tend to fall upon women through the loss of productive agricultural land, marginalisation and an increase in health risks, including HIV/AIDS.¹⁹

Box 2: Local employment in developed economies

Expectations of employment creation that benefits local communities are not restricted to gold mining operations in developing countries. For example, in Australia local content regulations have been in place since 2011, requiring mining companies to publish details of their procurement requirements and to report on their progress in using local suppliers.²⁰

Gold mining companies operating in developed countries such as Canada and Australia face strong pressure to demonstrate that local indigenous communities gain socio-economic benefits from the development of gold mining operations on their land.

One approach that has been deployed by a number of mining companies is to establish a separate 'arm's length' organisation, led by members of the local community, to lead on community investment activities. For example, as part of Barrick Gold's mining lease negotiations at Lake Cowal in New South Wales, Australia with the Wiradjuri Native Title Party, the Wiradjuri Condobolin Corporation was established to be an independent organisation focused on safeguarding indigenous heritage and maximising the socio-economic benefits that the Wiradjuri Condobolin people gain from the mine. Key programmes have included establishing a Business Hub to support local entrepreneurs, an education centre and a cultural heritage programme.²¹



Ensuring that local communities directly benefit from job creation opportunities is, and will remain, a critical issue for the gold mining industry.

The social development benefits that can be gained when women have the same access to employment opportunities as men are well understood. Where women have access to employment, evidence shows that women are more likely to invest in education, health, and nutrition for their families.

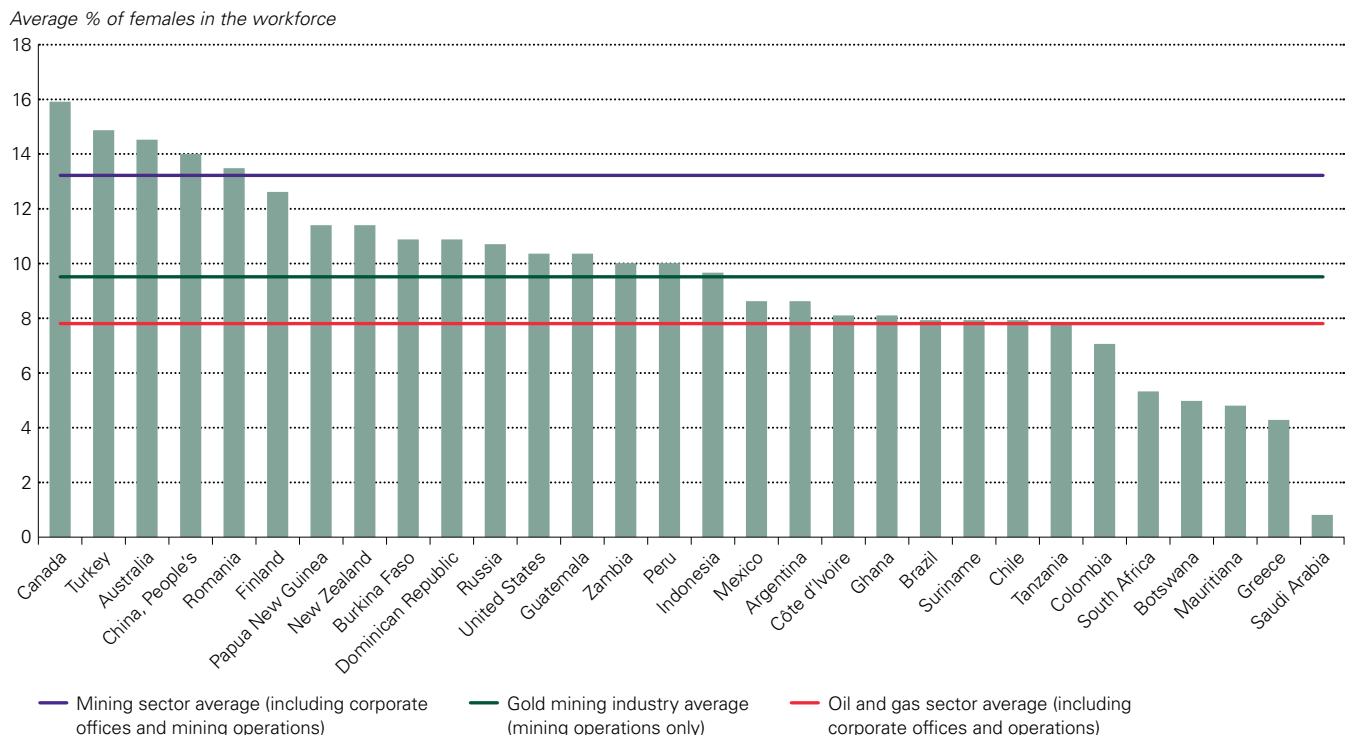
As a sector, the mining workforce remains male-dominated and the gold mining industry is no different. However, in recent years gender equality has rapidly risen up the agenda and become a strategic priority for most mining companies. Aside from societal expectation and, increasingly, legislative requirements, the business benefits of employing women in operational and managerial roles in the mining industry are now well understood. Companies have found that employing women can create a more predictable business environment with fewer production disruptions. Women are often more dependable, they follow rules, obey health and safety regulations, and can be more reliable employees.²² For example, the gold and silver mining company, Fresnillo, has actively targeted the recruitment of women as haul truck drivers as it found that women drivers drove more efficiently than their male counterparts, saving on fuel costs.²³ Companies have found that women haul truck drivers can extend the life of the truck tyres; an important

means of reducing operating costs when each tyre can cost in the region of US\$100,000.²⁴ More broadly, the mining industry as a whole is facing a future skills shortage. It has been estimated that the Canadian mining industry may need as many as 100,000 new workers in the next decade, a need that is unlikely to be met without the proactive recruitment of women.²⁵

Progress is being made across the extractive industries, though there is still some way to go. In 2013 it was estimated that women accounted for just over 13% of total employment in the mining sector.²⁶ By comparison, in the oil and gas sector women constitute around 8% of the total workforce.²⁷ **Chart 12** shows the average percentage of gold mining companies workforces occupied by women across different countries. It can be seen that the global average for women in gold mining company workforces is around 10%.

Whilst not diminishing the need for continued focus on gender equality, it is noteworthy that one study of a gold mine in west Africa found that although women only occupied just over 11% of jobs, on average female employees' salaries were 14% higher than the male average salary, reflecting that women tended to occupy higher skilled positions.²⁸

Chart 12: Percentage of women in the workforce of gold mining operations in different countries



Source: Maxwell Stamp analysis based on This is Gold and company sustainability reports.^{xiv} Oil and gas and mining sector estimates based on *Hays global salary guide*. Country selection based on data availability

xiv Gender diversity data at an operational level was obtained from the 2013 sustainability reports of Acacia (formerly African Barrick Gold), Agnico Eagle Mines, Alamos Gold, Barrick Gold, China Gold International Resources, Eldorado Gold, Goldcorp, Golden Star Resources, IAMGOLD, Kinross Gold Corporation, Newcrest Mining, Newmont Mining Corporation, Primero Mining Corporation and Yamana Gold.

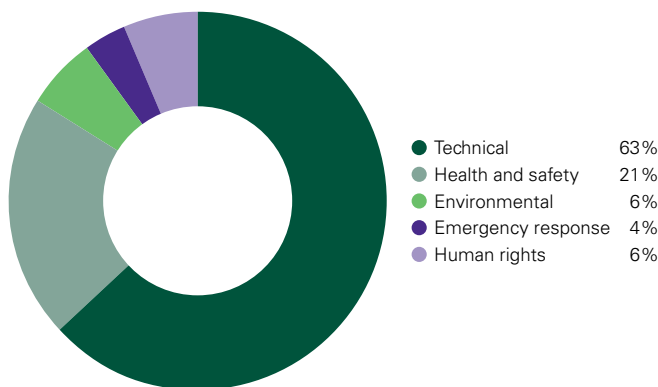
3.5 Building human capital

One important mechanism by which countries gain lasting benefits from the development of finite natural resources is through investments in human capital: the skills and expertise of people. Investments that companies make in training their workforce bring benefits to host nations by increasing productivity which in turn increases the value created for the economy. Broader benefits can also be obtained when training provides skills that are transferable beyond the mine and enable workers to obtain employment in other industries should employment at the mine no longer be available. For example, at Goldcorp’s Marlin mine in Guatemala the company has developed a literacy programme in association with Guatemala’s Ministry of Education which provides training in reading and writing to employees from local communities.²⁹

Chart 13 shows the breakdown of the different types of training that gold mining companies provide to their employees and illustrates the average number of hours of training on each topic that each employee receives in a year. The majority of employee training is technical job-related training, with the average gold mining employee receiving 30 hours of technical training each year. It is perhaps unsurprising that the majority of the workforce training effort is focused on technical skills development as this is directly related to the business needs; however, from a national development perspective this is noteworthy as it is highly likely many of the skills that mine employees learn may be transferable to other industries. Skills development also facilitates career progression, which in turn increases income. As workers advance in career development entry-level positions become available which may provide opportunities for new, low or unskilled local employees to join the workforce. In such a way, investments in training and skills development play a central role in bringing socio-economic benefits to local populations.

Training and workforce development is an important issue for gold mining companies wherever they operate. As a focus area for companies this is not limited to operations in developing countries. For example, according to the Minerals Council of Australia, Australian gold companies spend around 4% of their payroll costs on training, with the majority of gold mining companies providing both structured and unstructured training, and providing apprenticeship and trainee schemes to support new entrants to the workforce.³⁰ This is marginally higher than the averages seen in other industries. For example, a cross-sectoral survey of 475 US-based organisations found that firms typically dedicate 3.6% of payroll costs towards learning and development.³¹

Chart 13: Average training hours per subject per employee per year



Source: Maxwell Stamp analysis based on company sustainability reports^{xv}



Broader benefits can also be obtained when training provides skills that are transferable beyond the mine.

xv Data providing a breakdown of training hours and subjects was obtained from the 2013 sustainability reports of Acacia (formerly African Barrick Gold), Barrick Gold, Centerra Gold, China Gold International Resources, Eldorado Gold, Golden Star Resources, IAMGOLD, Kinross Gold Corporation, Newcrest Mining, Newmont Mining Corporation and Yamana Gold.

Section 4: Supporting communities

“Do your little bit of good where you are; it’s those little bits of good put together that overwhelm the world.”

Archbishop Desmond Tutu

- Maintaining the social licence to operate is a critical business issue and community investment activities have an important role to play in developing and maintaining this.
- Gold mining companies can catalyse development projects that improve the socio-economic conditions of host communities – often aimed at tackling similar issues to those that aid agencies seek to address.
- Community investment projects can often be supported by a sound financial business case which can enable companies to mobilise significant resources to address social issues in a way that traditional aid donors often cannot.
- Healthcare is a significant focus area for gold mining companies, particularly HIV/AIDS, tuberculosis and malaria – in a significant number of gold producing countries, the growth of the gold mining industry over a ten-year period coincides with a reduction in the prevalence of these diseases.

More so than many other industries, mining has a direct impact on the environment of the communities within the vicinity of a mine site. Whilst local communities may not often have formal regulatory control over mining companies, building and maintaining good relationships with local communities that enable operations to proceed with their ‘permission’ – often referred to as the social licence to operate – is a critical business issue for mining companies. The mining industry has been focused on this area for many years, with many of the community engagement strategies and methodologies developed by the sector, such as ICMM’s Community Engagement Toolkit, becoming recognised beyond the mining sector as good practice standards. Nevertheless, community relations remain a critical area for the mining sector; the social licence to operate was the third highest risk on EY’s 2014 business risks survey for mining and metals.³² The value of a mining company’s assets below ground can only be realised if the social and political environment above ground enables production.



The value of a mining company’s assets below ground can only be realised if the social and political environment above ground enables production.

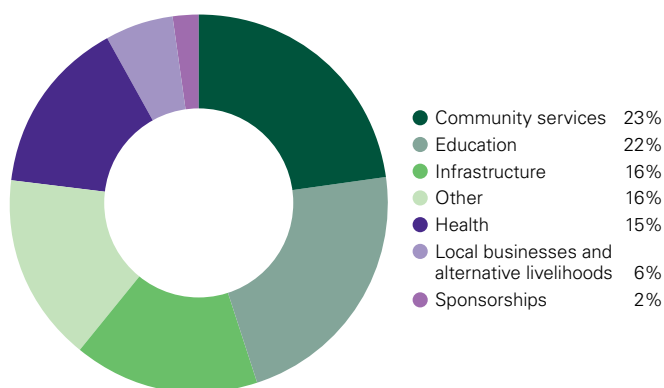
There is good reason for community relations to be considered a critical business issue. Academic studies on conflicts between communities and mining companies have identified several instances where project delays as a result of conflicts with local communities cost the projects around US\$20m per week as a result of delays to production.³³ A study of 26 gold mines owned by 19 publicly traded companies between 1993 and 2008 found that around two thirds of the estimated value of the gold controlled by these companies was related to the companies' management of external relationships with host communities and governments.³⁴ Conflicts between mining companies and local communities can result in operations being disrupted by protests, employees being intimidated, damage to property and even violence; all of which can be further complicated by local politics. Modern communications technology and social media mean that groups with grievances against companies can leverage support and gain profile very quickly and far more effectively than in the past.

Of course the need to build and maintain good community relations is just one of many factors driving the need for careful management of the socio-economic and environmental impacts of mining operations. In response, companies have evolved relatively sophisticated and broad corporate responsibility programmes, covering issues such as governance and ethics, employment, occupational health and safety, community and environment. Multiple mining-specific and cross-sectoral industry forums and voluntary performance standards have developed, such as the Mining, Minerals and Sustainable Development Project (which led to the creation of ICMM), the EITI, the World Economic Forum's Responsible Mineral Development Initiative, the Natural Resource Charter, the United Nations Guiding Principles on Business and Human Rights, the Voluntary Principles on Security and Human Rights, the OECD Guidelines for Multinational Enterprises and the World Gold Council's Conflict-Free Gold Standard, amongst others.

4.1 Distribution of community investments

As previously discussed in this report, the biggest in-country expenditures for gold mining companies are on suppliers and employee wages; expenditures that will in themselves have positive impacts for local communities. Over and above this, gold mining companies also spend significant amounts on community investment activities; on average around 0.9% of revenue from gold sales.^{xvi} It is worth noting that these investments continue to be made even when many companies are sustaining losses. **Chart 14** provides an illustration of the different types of areas in which gold mining companies make community investments. Due to the lack of comparability in how companies report different categories of community investment this chart relies on a small sample, nonetheless it is useful as an indication of community investment activity in the sector. It can be seen that 'community services' – investments in community facilities such as sports venues – and education are the largest categories, with infrastructure and healthcare also significant areas of investment.

Chart 14: Illustrative breakdown of gold mining community investment expenditures across different focus areas



Source: Maxwell Stamp analysis based on company sustainability reports^{xvii}

xvi Maxwell Stamp analysis based on 2013 reported data from 10 leading gold mining companies: Acacia (formerly African Barrick Gold), Barrick Gold, Centerra Gold, Eldorado Gold, Goldcorp, Golden Star Resources, IAMGOLD, Kinross Gold Corporation, Newmont Mining Corporation, Newcrest Mining.

xvii Data providing a breakdown of focus areas for community investment was obtained from the 2013 sustainability reports of Acacia (formerly African Barrick Gold), Goldcorp, Kinross Gold Corporation and Primero Mining Corporation.

One of the challenges for the industry in managing community relations is that there can sometimes be a misalignment between the focus of corporate activities and the expectations of external stakeholders. In Ghana, for example, the work conditions and health and safety of mine workers (which most mining companies publicly state as their highest priority) are almost completely absent from the lively public discussions and NGO campaigning activities, which are largely directed at environmental, community and human rights concerns.³⁵ This is not to suggest that health and safety should have a lower priority; rather it highlights the importance for companies of active engagement and communication with communities and wider stakeholders if they are to be seen as partners in the development of communities and nations.

It is increasingly recognised, both by the gold mining industry and by external stakeholders, that building linkages from the mine to the broader economy is central to supporting wider development of the local economy. An example of an initiative

designed to achieve this is the Ahafo Linkages project in Ghana, which was initially implemented by Newmont Mining with support of the International Finance Corporation and has been further developed by the Ghana Chamber of Mines. This project provides technical support and capacity building for small and medium-sized businesses and supports businesses that are, or could become, suppliers to the mine as well as other businesses within the wider community. One of the specific objectives of the project was to support economic diversification beyond mine-related procurement.³⁶ Part of the project's success has been due to the work undertaken to strengthen local business associations and service providers to local businesses, together with the encouragement of other businesses such as Ecobank, the pan-African commercial bank, to provide support to the project.³⁷



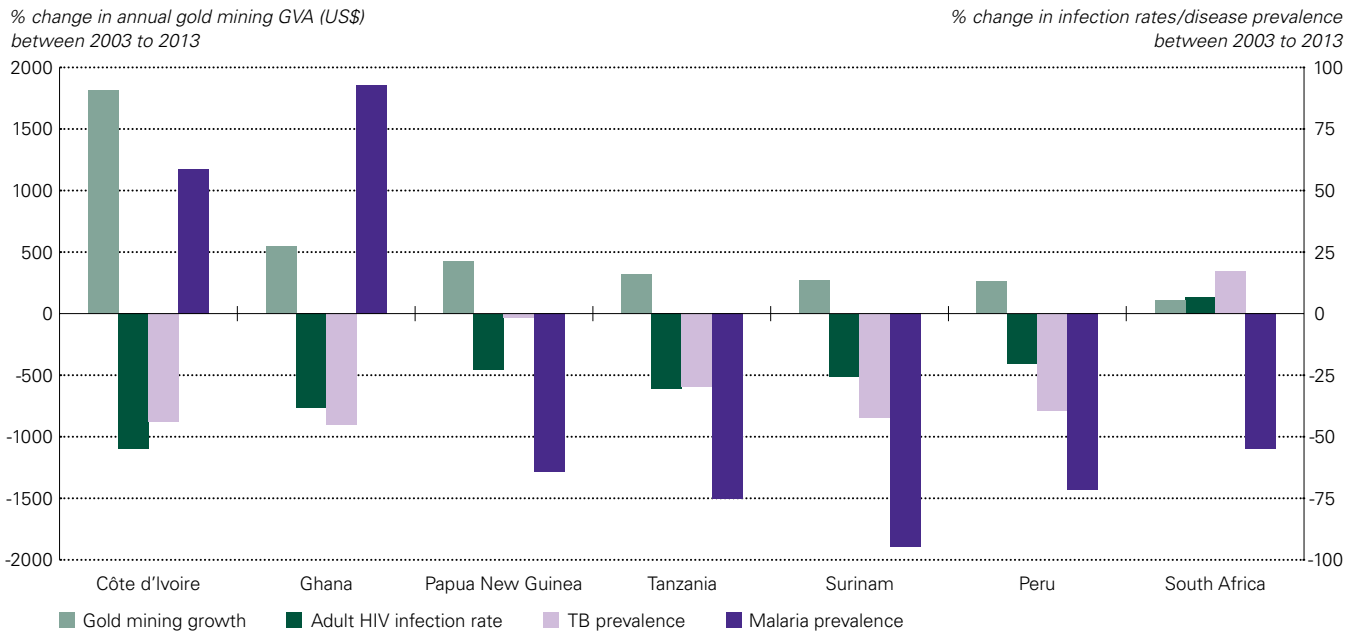
It is increasingly recognised, both by the gold mining industry and by external stakeholders, that building linkages from the mine to the broader economy is central to supporting wider development of the local economy.

4.2 Focus on healthcare

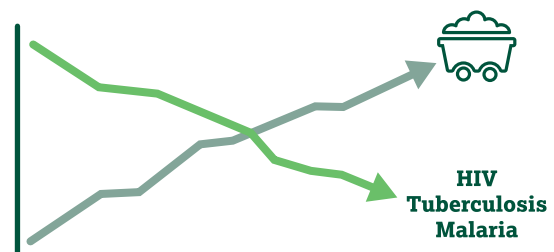
Healthcare is a priority area for many companies' community investment programmes. Beyond the benefits in terms of the social licence to operate, there are often commercial drivers for mining companies to invest in healthcare improvements for the communities surrounding their mines; investment in community healthcare can help minimise absenteeism and reductions in productivity due to workforce illness. Ensuring the provision of clean water and sanitation in areas which are the sources of labour are primary considerations, as is the management of more serious conditions that plague the gold mining industry such as malaria, tuberculosis and HIV/AIDS.

Chart 15 shows how the prevalence of HIV, tuberculosis and malaria has changed over a ten-year period in seven resource-dependent gold producing countries. The rate of growth of the gold mining industry over the same time period, as measured by direct GVA, is also shown. It can be seen that in most cases, as the gold mining industry has grown, the prevalence of these diseases has reduced. Whilst the improvements in disease control cannot be solely attributed to the gold industry, efforts by gold mining companies will have made a contribution. For example, Barrick Gold is working in partnership with the Asian Development Bank to operate a health clinic that provides voluntary HIV/AIDS testing for the local communities near its Porgera and Kainantu mines in Papua New Guinea.³⁸ **Box 3** provides an example of a company-led initiative to control malaria.

Chart 15: Trends in HIV, tuberculosis and malaria prevalence between 2003 and 2013 in seven gold producing countries compared against the rate of gold mining industry growth in each country



Source: Maxwell Stamp analysis based on GFMS, Thomson Reuters *Gold survey* and UNDP



Whilst not solely attributable to the gold industry, in several gold producing countries as the industry has grown the prevalence of a number of serious diseases has reduced.

There are exceptions, however, to the general trend in improvements to controlling HIV, tuberculosis and malaria in gold-producing countries. According to the World Health Organisation, deaths from malaria have decreased by 47% between 2000 and 2013 worldwide,³⁹ yet in Côte d'Ivoire and Ghana the prevalence of malaria has got worse, not better. This highlights the importance of gold mining companies continuing to play their part in assisting with control of this disease through initiatives such as the Obuasi model described in **Box 3**.

Similarly, whilst tuberculosis has generally reduced in most gold-producing countries, South Africa is experiencing a tuberculosis epidemic. In 2013 there were 760,000 new cases of tuberculosis reported in sub-Saharan Africa that were connected with the mining industry and in South Africa it is estimated that nine out of ten gold miners are latently infected with tuberculosis.⁴⁰ Gold mining companies have a central role to play in tackling this disease by identifying and treating workers who are infected with tuberculosis as well as developing and implementing initiatives such as silica dust control measures.

Box 3: AngloGold Ashanti – investing in malaria control

AngloGold Ashanti is a global gold mining company with operations throughout Africa, the Americas and Australia. One of AngloGold Ashanti's major mining operations in Ghana is located in Obuasi, a mining town in the southern part of the Ashante region, which has long been synonymous with gold mining in the country.

In 2004 the company identified that malaria had become a serious business issue. In 2005, the town's hospital, which is operated by the company, was treating on average 6,800 malaria cases each month, of whom 2,500 were mine employees. This represented over 30% of the mine's workforce, with almost 7,000 work days lost each month.

Working in collaboration with Ghana's ministry of health, AngloGold Ashanti developed a comprehensive malaria prevention and treatment programme that encompassed education, malaria prevention and treatment, and featured indoor residual spraying as the main form of prevention. The programme was rolled out in 2006, with the indoor residual spraying encompassing all structures (private and mine-owned buildings, and surrounding villages) in Obuasi municipal district.

The indoor spraying programme is a key feature that distinguishes the 'Obuasi model' from many other malaria treatment programmes. The spraying benefits the entire

community as, quite simply, there are fewer mosquitos that can spread malaria. Despite the World Health Organisation recommending indoor spraying with residual insecticide as a "powerful way to rapidly reduce malaria transmission," indoor spraying is used comparatively little compared to mass distribution of bed nets as the spraying needs to be carried out comprehensively in a particular area in order to be effective. This can be both technically demanding and comparatively expensive; consequently many aid organisations therefore don't undertake such spraying programmes.

However for AngloGold Ashanti, in addition to the community relations benefits of the Obuasi programme there are clear commercial benefits through substantially improved workforce productivity that more than offset the costs of the programme. In Obuasi district there has been a 79% reduction in malaria cases reported since 2006, and a 94% reduction in the working time lost by mine employees to malaria.

Following the success of the Obuasi model, AngloGold Ashanti set up a separate company which is managing a national malaria treatment programme funded by a five-year US\$154mn grant from Global Fund to Fight AIDS, Tuberculosis and Malaria. The national programme began operations in 2011. AngloGold Ashanti is also deploying the Obuasi model at its other mine sites in Africa.^{41 42 43}

Conclusions

Without economic development there can be no sustainable poverty reduction. For some countries there is no path to development that does not involve leveraging the contributions of extractive industries such as gold mining. This report has shown that gold mining industry has a key role to play in helping to develop nations and provide opportunities to enhance public well-being. It has also shown that these benefits extend far beyond those that many stakeholders traditionally focus on, such as the mineral royalties received by governments. Any discussion of how to maximise the contributions of gold mining to host economies needs to consider the broader context, including the indirect impacts of the industry supply chain and also the broader investments that companies make in people and in host communities.

There are many benefits for host communities and governments in gold producing countries. However, there remain very significant challenges. Whilst many communities are benefiting from responsible gold mining, there are others where there are disputes and even conflict between mining companies and other stakeholders. Undoubtedly, gold mining companies bear a burden of responsibility to ensure that their presence in a community and country results in socio-economic benefits.

However, this cannot be the responsibility of companies alone. Partnerships are key. Furthermore, for gold mining companies to be active development partners, host country governments need to ensure that there is a viable commercial operating environment in place. Nonetheless, considering gold mining companies as development partners for gold producing countries would represent a major shift from the conventional, more transactional type of relationship that currently exists between many industry, government and community stakeholders, and a major milestone in the journey towards sustainable socio-economic development. By shedding some light on the broader socio-economic effects of the gold mining industry, it is hoped that this report at least marks a contribution towards that journey.

Improving socio-economic development reporting

In undertaking this research there were a number of notable deficiencies in the available data; addressing these would be of significant benefit to all stakeholders working on understanding, improving or making the most of the socio-economic impacts of gold mining. Key areas for improvement include:

- **Defining local:** Despite local content being a high business issue both within and beyond the gold mining industry, it remains an area that suffers from a lack of consistent definitions and terminology. This hinders effective dialogue between stakeholders as well as limiting the ability for companies to report on their performance and for stakeholders to evaluate performance. The gold mining industry could develop and agree to report against consistent definitions and utilise standard metrics.
- **Socio-economic baselines:** A common challenge in development (that is not unique to the gold mining industry) is a lack of baseline social and economic data against which the effectiveness of socio-economic development initiatives can be measured. Whilst the gold mining industry cannot take responsibility for national-level data deficiencies in host nations, they could work in partnership with local stakeholders to support the systematic collection, analysis and utilisation of relevant data from communities impacted by mining operations. Where appropriate, companies could support appropriate research institutions in building or updating datasets that would be useful not just for analysing the company's own impacts but also more broadly by other development actors.
- **Community investment data:** Few companies provide a breakdown of precisely how community investment funds are spent, and where information is provided definitions often vary between companies. This is not covered by the Global Reporting Initiative indicators against which many companies report, but would be useful at a local or national level for quantifying certain aspects of companies' contribution to development and thereby informing subsequent analyses of effectiveness (i.e. are community investments achieving the desired outcomes?). Whilst care would be needed on how such information is disclosed in order to avoid potential risks such as inter-community rivalry, such data could usefully support companies in understanding and improving the development effectiveness of their community investment activities. The gold mining industry could agree to report this information against consistent categories and definitions.



This research has found notable gaps in the available data on the social and economic impacts of gold mining – addressing this would be of significant benefit to all stakeholders.

Appendix: Study methodology

This appendix describes the mechanisms and data sources employed in this study to calculate the economic contributions of the gold mining industry. Primarily, it provides an explanation of the techniques applied in calculating direct and indirect Gross Value Added (GVA) in both a national and regional context. A description of the techniques used to estimate direct and indirect employment is also included.

A1. Gross Value Added

Calculating GVA is a widely recognised approach for estimating the economic contribution of a particular company or industry to the economy of a country or region.⁴⁴ GVA is closely linked to Gross Domestic Product (GDP), the primary means by which national economies are measured, and forms part of its calculation.^{xviii} Similar to GDP, estimates of GVA can be compiled using three approaches:

- Total value of output less intermediate consumption (production).
- Total earnings derived from production (income).
- Total expenditure on goods and services (expenditure).

In theory, all three approaches (income, expenditure or production) will produce the same results.

A1.1 National GVA

This report uses the income approach to calculate the value added in each nation's gold mining industry. This approach calculates the total income directly earned by companies and their employees from the production of goods or services and was selected as the key data inputs to the GVA calculation, described below, are widely available in reports published by listed gold mining companies and by industry data providers.

A number of data sources were utilised in our estimation of GVA. The average annual gold price supplied by The London Gold Market Fixing Limited (TLGMFL), the annual gold output figures recorded by GFMS, Thomson Reuters *Gold survey* and industry production costs provided by GFMS, Thomson Reuters *Gold mine economics service* were used to forecast total corporate earnings in the industry before tax, depreciation and amortisation. Data on labour costs, sourced from GFMS, Thomson Reuters *Gold mine economics service*, acted as a proxy for labour compensation and are added to the estimate of corporate earnings to produce a measure of direct GVA for each country i at time t as illustrated in the following equation:

$$\begin{aligned} \text{Revenues}_i^t &= \text{Price}^t \times \text{gold output}_i^t \\ \text{Direct GVA}_i^t &= \text{Revenues}_i^t - \text{Operating costs}_i^t + \text{Labour compensation}_i^t \end{aligned}$$

A1.2 Regional GVA

National GVA estimations formed the basis of the regional analysis. Amongst the regional groupings, the value added by each gold producing country was totalled to give an estimate of the value created in each region, as illustrated in the following equation:

$$\text{Direct GVA}_{\text{South America}}^t = \text{GVA}_{\text{Peru}}^t + \text{GVA}_{\text{Brazil}}^t + \text{GVA}_{\text{Argentina}}^t \dots + \text{GVA}_{\text{Other}}^t$$

In some cases a proportion of the regional gold output reported by the GFMS, Thomson Reuters *Gold survey* was attributed to 'other countries' within a region rather than being assigned to specific named countries. A credible estimation of the GVA produced in these unclassified countries was achieved by calculating the average earnings and compensation per ounce of gold within each region before multiplying these figures by the recorded volume of gold produced by the unclassified countries within the region. Regional GVA is therefore equivalent to the sum of the value added by all classified and unclassified countries in that region.

xviii Gross Domestic Product (GDP) is equal to the GVA associated to a particular firm, nation or region plus taxes and minus any subsidies on goods or services.

A2. Indirect gross value added

Within this report, indirect GVA refers to the rise in demand and economic output created in other industries as a result of gold mining activities. In order to calculate indirect GVA it is necessary to identify appropriate multipliers; the ratio by which the direct contribution can be multiplied by to provide an estimate of the indirect impact within an economy.

For this study a comprehensive review of the published literature on economic multipliers in the mining industries was undertaken. A wide selection of multipliers were identified

which depict the ratio between the total, indirect and direct effects. As it would be misleading to assume the magnitudes of the indirect impacts are equivalent for each region, the multipliers are categorised based on the dynamics and characteristics of the respective gold industries in each region (**Table A1.1**). The median multiplier value across each sample was calculated before applying this to the estimates of direct GVA. Given the limited number of published studies on industries in Asia, Russia and CIS, a multiplier based on the full sample was used to estimate the indirect impact in these regions.

Table A1.1: Value added multiplier analysis

Industry	Location	Direct impact	Indirect impact	Direct and indirect impact	Source: Author (date)
Africa (not including South Africa)					
Gold mining	Ghana	1.0	1.80	2.80	Kapstein et al. (2011) ²⁷
Gold mining	Tanzania	1.0	1.52	2.52	Ernst & Young (2013) ⁴⁵
Cooper mining	Zambia	1.0	1.20	2.20	ICMM (2014) ⁴⁶
Median value			1.52	2.52	
South America					
Mining sector	Peru	1.0	0.90	1.90	World Gold Council (2011) ⁴⁷
Metals mining	Chile	1.0	0.80	1.80	McCurdy, K., Keresztes, T. (2012) ⁴⁸
Copper mining	Chile	1.0	0.28	1.28	Aroca, P. (2000) ⁴⁹
Median value			0.80	1.80	
North America, Oceania, Europe and South Africa					
Gold mining	South Africa	1.0	1.20	2.20	Virtual Metals Research & Consulting Limited (2006) ⁵⁰
Gold mining	South Africa	1.0	1.73	2.73	Genesis Analytics (2008) ⁵¹
Gold mining	South Africa	1.0	0.70	1.70	Holland, N. (2014) ⁵²
Gold mining	Canada	1.0	0.61	1.61	Dungan, P., Murphy, S. (2014) ⁵³
Gold mining	Canada	1.0	0.54	1.54	Dungan, P., Murphy, S. (2014) ⁵²
Metals mining	Finland	1.0	1.47	2.47	McCurdy, K., Keresztes, T. (2012) ⁴⁶
Metals mining	UK	1.0	0.77	1.77	McCurdy, K., Keresztes, T. (2012) ⁴⁶
Metals mining	Spain	1.0	1.33	2.33	McCurdy, K., Keresztes, T. (2012) ⁴⁶
Gold mining	New Zealand	1.0	1.29	2.29	Brent, W. (2003) ⁵⁴
Gold mining	Romania	1.0	2.0	3.0	Oxford Policy Management (2009) ⁵⁵
Mining	USA	1.0	0.6	1.6	Barnett, C. (1999) ⁵⁶
Mining	South Australia	1.0	1.0	2.0	Barnett, C. (1999) ⁵⁵
Median value			1.10	2.10	
Asia, Russia and CIS					
Silver, gold and copper mine	Mongolia	1.0	0.97	1.97	Stokes, E. (2005) ⁵⁷
Median value			0.97	1.97	
<i>Full sample median value</i>			<i>1.00</i>	<i>2.00</i>	

A3. Employment

The number of people directly employed within each region's gold industry was estimated using an analysis based on the recorded level of output. First, a regional average output per employee was estimated from the information provided in company accounts, the World Gold Council *Responsible gold mining and value distribution survey*, and This is Gold survey. As illustrated in the formula below, the average output per employee in a region was then compared against the total gold output recorded by GFMS, Thomson Reuters *Gold survey* for the same region to give an extrapolated estimate of the number of workers directly employed in each region *j* as shown in the following equation:

$$\text{Direct employment}_j = \frac{\text{Gold output}_j}{\text{Average output per employee}_j}$$

A3.1 Indirect employment

Estimates of the direct employment were combined with the findings from our multiplier analysis to obtain a measure of the number of jobs indirectly created through the gold mining industry. The table below lists the data sources, regional groupings and estimated median values which were applied to the direct employment figures in order to estimate indirect employment.

Table A1.2: Employment multiplier analysis

Industry	Location	Direct impact	Indirect impact	Direct and indirect impact	Source
Africa (not including South Africa)					
Mining	Tanzania	1.0	7.6	8.6	ICMM (2007) ⁵⁸
Gold mining	Tanzania	1.0	6.87	7.87	Ernst & Young (2013) ⁴⁴
Cooper mining	Zambia	1.0	2.61	3.61	ICMM (2014) ⁴⁵
Gold mining	Tanzania	1.0	3.0	4.0	World Gold Council (2009) ⁵⁹
Gold mining	Mali	1.0	6.0	7.0	United Nations Conference on Trade and Development (2007) ⁶⁰
Median value			6.0	7.0	
North America, Oceania, Europe and South Africa					
Gold mining	Canada	1.0	1.92	2.92	Dungan, P., Murphy, S. (2014) ⁵²
Gold mining	Canada	1.0	1.44	2.44	Dungan, P., Murphy, S. (2014) ⁵²
Gold mining	Australia	1.0	2.13	3.13	Minerals Council of Australia (2013) ⁶¹
Gold mine	New Zealand	1.0	1.19	2.19	Brent Wheeler (2003) ⁵³
Gold mining	Romania	1.0	3.25	4.25	Oxford Policy Management (2009) ⁵⁴
Mining	USA	1.0	1.8	2.8	Barnett, C (1999) ⁵⁵
Mining	South Australia	1.0	3.0	4.0	Barnett, C (1999) ⁵⁵
Median value			1.92	2.92	
South America					
Mining sector	Peru	1.0	4.0	5.0	Mining Institute of Engineers of Peru (2010) ⁶²
Mining sector	Peru	1.0	1.9	2.9	World Gold Council (2011) ⁴⁶
Metals mining	Chile	1.0	4.41	5.41	McCurdy, K., Keresztes, T. (2012) ⁴⁶
Large copper and gold mines	South America	1.0	2.84	3.84	Ernst & Young (2013) ⁴⁴
Medium gold mines	South America	1.0	2.28	3.28	Ernst & Young (2013) ⁴⁴
Median value			2.84	3.84	
Asia, Russia and CIS					
Silver, gold and copper mine	Mongolia	1.0	2.05	3.05	Stokes, E. (2005) ⁵⁶
Median value			2.05	3.05	
<i>Full sample median value</i>			<i>2.73</i>	<i>3.73</i>	

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