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InBrief: Mining's Contribution to Sustainable Development

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ICMM
International Council on Mining & Metals

InBrief

The role of mining in national economies

Mining's contribution to sustainable development
October 2012



The role of mining in national economies

InBrief

Introduction

The mining industry is a major force in the world economy, occupying a primary position at the start of the resource supply chain. However, its role in contributing to the national economies of different countries varies greatly and is neither well documented nor well understood.

This publication addresses three interlinked topics. Firstly, it provides a global context for mining's economic contribution that shows trends in the value of world production and identifies major producer countries. Secondly, it focuses on the elements of economic contribution at the national level. Here, a Mining Contribution Index (MCI) has been developed and each of the world's 212 countries is compared using this index.

Lastly and of particular importance, mining's growing role in many low and middle income countries is examined and observations are offered regarding mining, development and poverty reduction. Evidence from case studies conducted by ICMM shows that foreign exchange earnings from mining can increasingly create positive developmental effects. In many countries, the mining and metals industry is gaining recognition as an important contributor to the critical policy objectives of job creation and poverty reduction.

Mining's contribution to sustainable development

ICMM has commissioned this series of publications to describe mining and metals' contribution to sustainable development. It seeks to set out some of the more important benefits, costs, risks and responsibilities related to mining and metals in today's world.

The first in the series – *Mining's contribution to sustainable development* – provides an overview of the series and introduces the concept of contribution analysis. *The role of mining in national economies* examines the contribution of mining activities in all countries with an overview of the contribution to the global economy. *Trends in the mining and metals industry* provides a forward looking discussion of trends likely to govern the evolution of the industry over the next decade.

In *Uses of minerals and metals*, a treatment of the current and future contribution of minerals- and metals-based products to sustainable development is offered. Building on this theme, *The role of minerals and metals in a low carbon economy* focuses on the materials needed for the technologies to address the climate change challenge.

The next two titles in the series focus on the contribution of mining to people and the environment. *Human rights, social development and the mining and metals industry* focuses on the role of business in contributing to the realization of human rights. Whilst *Mining and the environment* looks at how mining companies are tackling the challenge of achieving a net positive contribution from their activities.

Together these discussions are intended as a starting point for the industry and others to more fully examine the contribution of mining and metals to sustainable development, a conversation that will continue for years to come. They are intended to stimulate an exchange of ideas leading to the development of innovative ways forward. The series was launched at the Rio+20 summit in June 2012 and individual titles are being released periodically.

About ICMM

The International Council on Mining and Metals (ICMM) was formed in 2001 to catalyze improved performance and enhance the contribution of mining, minerals and metals to sustainable development. Today, it brings together 22 mining and metals companies as well as 34 national and regional mining associations and global commodity associations. ICMM's member companies employ close to one million of the 2.5 million people working in the sector worldwide. These companies have some 800 operations in over 60 countries producing 30–40% of the world's hard mineral commodities including iron ore, gold, platinum and nickel. We engage with a broad range of stakeholders – governments, international organizations, communities and indigenous peoples organizations, investors, civil society and academia – in order to build meaningful relationships. Our vision is one of leading companies working together and with others to strengthen the contribution of mining, minerals and metals to sustainable development.

About the authors

This series has been developed by ICMM with input from members, subject matter experts and representatives of organizations we work with. ICMM would like to thank them all for their contributions. Information on the authors and reviewers for each title is provided on the back cover.

1. Global context of mining's macro-economic contribution

Trends in the nominal value of world mineral production

In 2010, the nominal value of world mineral production was nearly four times higher than it had been in 2002. Figure 1 shows that, during this period, growth in value has been significantly greater than growth in world gross domestic product (GDP). This increase has in large part been driven by the unprecedented growth in China, India and other emerging economies coupled with the associated sharp rise in commodity prices. In contrast, the preceding decade (1992–2002) saw no nominal growth – but rather a reduction in real terms, when adjusted for inflation.

"In 2010, the nominal value of world mineral production was nearly four times higher than it had been in 2002."

The major producer countries

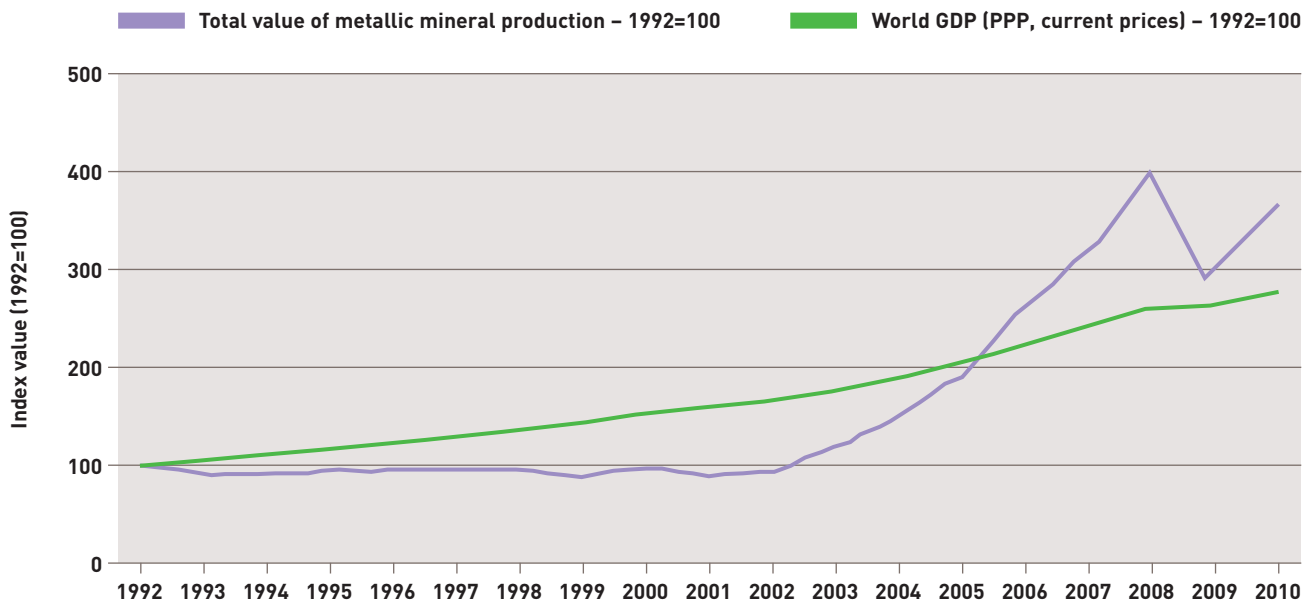
Table 1 (overleaf) gives another perspective on mining's contribution to the world economy. It presents a simple summary of mining production values in the 20 most significant mineral producing countries in terms of production value and share of global production value in 2010 (columns 1 and 2). The same data for most countries is provided on page 12 as part of a discussion on the presentation of the Mining Contribution Index (MCI). Please see page 9 for definitions and sources.

The table

- compares the 2010 values and shares of production in each country (columns 1 and 2) with the corresponding values and shares for the year 2000 (columns 3 and 4), and the change in production values between 2000 and 2010–2010 (column 5)
- indicates the relative significance of mineral production by expressing it as a percentage of each country's GDP (columns 6 and 7)
- shows a corresponding value for reliance on mineral exports (column 8).

The table is dominated by the major developed country producers and by large emerging market producers including the five BRICS (Brazil, Russia, India, China, and South Africa) as well as other important emerging economies (e.g. Chile, Indonesia and Mexico). This contrasts sharply with the ranking of countries by their reliance on mining exports presented in Table 2 in which lower income countries figure much more prominently.

Figure 1: World GDP and mineral production – 1992 to 2010



Source: Raw Materials Group; World Bank.

The role of mining in national economies

Table 1: Top 20 countries in terms of production value

Rank and country	2010 Production value (current US$ million) (1)	2010 Production value (2)	2000 Production value (current US$ million) (3)	2000 Production value (4)	Change in production value 2000–2010 (5)	2010 Production value as % of 2010 GDP (6)	2000 Production value as % of 2000 GDP (7)	2010 Mineral export contribution (8)
1 Australia	71,955	15.6%	16,444	14.7%	337.8%	7.8%	3.9%	40.3%
2 China	69,281	15.0%	10,576	9.4%	555.1%	1.2%	0.9%	1.5%
3 Brazil	47,027	10.2%	7,754	6.9%	506.5%	2.3%	1.2%	19.0%
4 Chile	31,275	6.8%	10,452	9.3%	199.2%	14.7%	13.9%	65.9%
5 Russian Federation	28,680	6.2%	10,776	9.6%	166.1%	1.9%	4.1%	6.6%
6 South Africa	27,116	5.9%	12,694	11.3%	113.6%	7.5%	9.6%	37.4%
7 India	26,042	5.6%	2,930	2.6%	788.8%	1.5%	0.6%	17.9%
8 United States	22,957	5.0%	11,253	10.0%	104.0%	0.2%	0.1%	6.2%
9 Peru	18,832	4.1%	4,682	4.2%	302.2%	12.0%	8.8%	62.7%
10 Canada	13,984	3.0%	7,853	7.0%	78.1%	0.9%	1.1%	11.9%
11 Indonesia	12,225	2.6%	4,948	4.4%	147.1%	1.7%	3.0%	10.6%
12 Ukraine	9,283	2.0%	1,807	1.6%	413.6%	6.7%	5.8%	8.2%
13 Mexico	8,361	1.8%	2,426	2.2%	244.6%	0.8%	0.4%	4.9%
14 Kazakhstan	7,248	1.6%	2,390	2.1%	203.3%	4.9%	13.1%	13.1%
15 Iran, Islamic rep.	4,387	0.9%	802	0.7%	446.8%	1.3%	0.8%	3.7%
16 Philippines	4,221	0.9%	397	0.4%	964.1%	2.1%	0.5%	6.8%
17 Sweden	3,974	0.9%	1,058	0.9%	275.5%	0.9%	0.4%	5.3%
18 Ghana	3,964	0.9%	1,015	0.9%	290.4%	12.7%	20.4%	25.4%
19 Zambia	3,850	0.8%	616	0.5%	524.7%	23.8%	19.0%	83.6%
20 Papua New Guinea	3,166	0.7%	1,338	1.2%	136.5%	33.4%	38.0%	54.0%
Total top-20	417,867							
as % of World production	88%							

Source: World Bank, UNCTADstat and Raw Materials Group. Full definitions and sources provided on page 9.

"Insofar as production and income generation are critical forces in poverty reduction, mining has an increasingly significant role to play."

2. National context of mining's macro-economic contribution

Mineral exports

A recent assessment of global trade data indicates that in 2010 there were 40 countries that could be defined as relying on non-fuel minerals for over 25% of their merchandise exports (OPM, 2011a). Of these, 75% are low and middle income countries. This number represents a considerable rise over time: in 1996 there were only 29 mineral reliant economies and, as recently as 2005, there were 33. Dramatic changes in this indicator have occurred since 2005 when commodity prices started to rise rapidly. In the years to 2010 eight additional countries have entered the ranks of mineral-reliant countries including Bolivia, Burkina Faso, Georgia, Ghana, Guyana, Lao PDR, Montenegro and Somalia.

Table 2 presents a list of the 20 countries with the highest mineral export contributions as a percentage of total merchandise exports in 2010. It shows that over time, more relatively low income countries are becoming increasingly reliant on export revenues from minerals as the main source of foreign exchange earnings.

Many of these countries have low Human Development Index (HDI) scores, which draws attention to the potential for productive sectors, such as mining, to make a contribution. In particular, case-study work (page 6) has found that in some countries (for example Chile, Ghana and Brazil), mining areas have enjoyed stronger poverty reduction and social development performance than non-mining areas. In other countries (including Peru and Tanzania) the evidence on this point is more ambiguous.

Half of the non-fuel mineral reliant countries are in Africa and some of these – for example, Tanzania, Ghana and Mozambique – will soon become significant exporters of oil and gas as well as non-fuel minerals. This trend is of rising significance for many aspects of policy in the affected economies and warrants greater and more regular attention. Above all it confirms the proposition that insofar as production and income generation are critical forces in poverty reduction, mining has an increasingly significant role to play. This is a reality already recognized and reflected in the agenda of some of the more responsible global mining companies, but not yet recognized consistently among governments, companies, civil society and other stakeholders in countries hosting large mining investments.

Table 2: Reliance on export of metallic minerals

Rank and country	GDP/capita (PPP at current prices, 2009, US$)	Mineral export contribution 1996	Mineral export contribution 2005	Mineral export contribution 2010	Change in mineral contribution 1996–2010 (Percentage points)
1 Botswana	$13,384	58.7%	86.5%	83.7%	25
2 Zambia	$1,430	79.4%	64.0%	83.6%	4
3 Dem. Rep. of the Congo	$319	72.4%	70.2%	78.3%	6
4 Mongolia	$3,522	60.3%	70.1%	77.6%	17
5 Suriname	–	68.0%	64.3%	75.4%	7
6 French Polynesia	–	69.2%	55.3%	67.1%	-2
7 Chile	$14,311	47.7%	56.5%	65.9%	18
8 Guinea	$1,048	77.1%	84.0%	65.2%	-12
9 Peru	$8,629	48.3%	57.9%	62.7%	14
10 Mauritania	$1,929	36.1%	49.3%	60.4%	24
11 Northern Mariana Islands	–	3.3%	4.5%	58.9%	56
12 Mozambique	$855	6.1%	66.9%	57.0%	51
13 Mali	$1,186	8.5%	37.2%	54.8%	46
14 Sierra Leone	$808	30.6%	58.2%	54.3%	24
15 Papua New Guinea	$2,281	24.5%	39.2%	54.0%	30
16 Namibia	$6,410	36.2%	41.2%	53.4%	17
17 Nauru	–	73.1%	25.2%	50.8%	-22
18 Armenia	$5,279	23.9%	39.8%	50.6%	27
19 Jamaica	$7,633	49.7%	68.5%	49.6%	0
20 Cuba	–	15.1%	39.2%	47.7%	33

Source: Reproduced from OPM (2011). Definition of mineral exports provided on page 9.

Case study evidence of contributions

Ten case studies conducted by ICMM and the consultancy firm Oxford Policy Management (OPM) using the ICMM *Mining: Partnerships for Development Toolkit*, give valuable context-specific insights into the macro-economic contributions of mining. This in turn provides the basis for assessing a broader range of impacts on national economies than is possible using export and production data alone.

The case studies are: Brazil, Chile, the Democratic Republic of Congo, Ecuador, Ghana, Guinea, Lao PDR, Peru, Romania and Tanzania. They clearly show that contributions are multi-faceted within countries. Mining provides vastly different levels of contribution in relation to the different macro-economic aggregates of most economies. Contributions also vary across and within countries. For example, the contribution of mining to government revenues and employment can differ quite significantly from one country to another depending on a range of factors.

> "The emerging evidence indicates that mining FDI combined with increased foreign exchange earnings can be a catalyst for some countries to improve their credit ratings and attract long-term loan funding from abroad."

The main observations from the case studies can be summarized as follows.

1. Foreign direct investment (FDI)
In most cases the contribution of mining to the case-study countries' total FDI has been very high – typically more than half of total annual FDI. This contribution is especially significant in low income countries, pointing to their ability to attract mining investment even when FDI into other sectors appears unattractive. The emerging evidence also indicates that mining FDI combined with increased foreign exchange earnings can be a catalyst for some countries to improve their credit ratings and attract long-term loan funding from abroad (e.g. Ghana and Tanzania). There are, however, some significant exceptions to this pattern. Brazil, for example, is one of the world's most successful emerging market economies in terms of attracting FDI (in excess of US$50 billion per annum in recent years). Yet FDI into the mining sector represents a very small share of the total FDI received by Brazil – partly because the economy is more diversified and partly because a significant proportion of Brazil's recent investment in mining is attributable to domestic investment by its largest mining company, Vale.

2. Total national investment
Mining makes a very significant contribution to national investment totals especially when mining activity is building up from a low base (e.g. Tanzania 1999–2006). In the case of Brazil, Vale's investments alone are the equivalent of almost 5% of total annual national investment.

3. Exports
The case study evidence confirms the high contribution mining makes to exports for many countries. The contribution of mining to total exports in 2010 amounted to:

Democratic Republic of Congo	78.3%
Chile	66.0%
Guinea	65.2%
Peru	63.0%
Lao PDR	45.0%
Tanzania	41.0%
Ghana	25.0%
Brazil	19.0%

4. Net foreign exchange earnings
The mining sector generates significant foreign exchange earnings. A substantial proportion of these do not, however, enter the national economy as they are used by mining companies to import goods and services during construction and operation. Nevertheless, the case studies point to a significant net foreign exchange contribution in the operational phase – even when imports are factored in. During the construction phase the high-import content is typically almost fully accounted for by the inflows of foreign equity and loan capital. The time sequence of the various different foreign exchange effects are well illustrated by the examples of Tanzania (ICMM 2009) and Romania (OPM 2009a).

5. Government revenues
The case studies suggest considerable country-by-country variation in terms of the contribution of mining to total government revenues, and the allocation of these revenues between the national and sub-national levels. However, a consistent theme is that the long-term picture of mining's contribution to tax revenues (as well as the other dimensions of mining and metals' macro-economic contribution) needs to be considered. In every case, the full fiscal contribution of mining projects does not occur until well after project start-up, particularly in terms of income taxes paid by companies. This is due to long lead times as well as the accelerated capital write-downs that are commonly used to incentivize investment. Interestingly, the Tanzanian ICMM study (2009a) and separate studies by OPM on Romania (OPM 2009a) and Guinea (OPM 2009b) all show how government mineral revenues rise sharply as a share of total government revenues some seven to eight years after major mining activities are initiated (to around 8% of total revenues in the case of Tanzania and Romania). (See section 3 for additional discussion of the time horizon issue).

6. Gross Domestic Product (GDP)
The case studies suggest that mining typically provides only a modest direct contribution to a country's GDP and the various income modules that are components of GDP (typically around 2–4% of national totals). This relatively low number is partly explained by the fact that developing host countries often lack the industrial base to supply the sophisticated mining technology used in modern mines. As a result, many upstream value additions (GDP contributions), such as mineral beneficiation, take place outside the host country. However, in more mature industrial economies such as Romania and Brazil, the multiplier effects on GDP can be quite significant - one dollar of economic activity in the mining sector can generate three dollars or more of economic activity elsewhere. Where this happens, the total GDP contribution of mining (direct and indirect) is much larger than the "typical" 2–4% referred to above.

7. Employment and wages
Similar findings have been obtained in relation to mining's contribution to employment. New direct jobs created by large mining companies are normally well-remunerated compared to prevailing national average income levels, though the numbers of such jobs are relatively small – rarely more than 1.5% of total national employment. Analysis from the case studies shows that mining may be successful in generating indirect employment in the supply chain, as well as induced employment as the salaries of direct employees or supplier employees are spent within the wider economy. Such employment multiplier effects can often be significant. One direct mining company employee may correspond to three or four employees elsewhere in the economy. In poorer regions where mining is the dominant activity, these indirect employment effects can be especially important (Pará state in Brazil is a good example, see ICMM 2012).

"Analysis from the case studies shows that mining may be successful in generating indirect employment in the supply chain, as well as induced employment as the salaries of direct employees or supplier employees are spent within the wider economy."

Though based on data for a small number of countries, the case studies help explain why mining can so easily attract negative criticism regarding its socio-economic contributions to host economies. This point is further discussed in the context of poverty reduction (page 19). All the larger direct contributions are concentrated at the national level, while the smaller contributions (especially employment) apply to local mining communities where more disruptive effects are likely to arise, such as resettlement of populations, environmental change, and disruption of traditional livelihoods. This also helps explain why a gap remains between the potential and realized contribution of mining. Mining companies implement difficult projects locally and get little credit for this contribution. Government has an important role to play in managing these issues in the best interests of their citizens.

The solution to this inherent structural difficulty is to find more and better ways to enhance the magnitude of the local benefits through, for example, pro-active development of indirect jobs, as well as careful redirection of the large national benefits (e.g. government revenue) for use in local areas. The case studies referenced above point to an increasing number of examples where this is being done relatively successfully.

A preliminary Mining Contribution Index (MCI)

There is no economic study group – including from within the World Bank or the International Monetary Fund – that systematically captures the important role of the extraction and production of mining, minerals and metals in the economies of each country of the world. Until now, this data limitation has prevented a country-by-country assessment of the varied macro-economic contributions of the mineral sector to national economies.

As a basis for discussion and a first step towards providing a long-overdue and continuously updated set of data on mining's overall economic contribution, ICMM, with Oxford Policy Management (OPM), has developed a preliminary index, which ranks countries by the importance of mining and metals within each national economy (the Mining Contribution Index – MCI). The MCI is calculated based on aspects of mining and metals contribution to national economies where country-by-country data exists. At present the MCI is limited to three variables based on contributions to exports and production values, which are used to calculate an overall MCI score for each country (see Box 1). All countries are ranked on this MCI score and grouped into five quintiles, which are colour coded and shown on a map. The map is provided on page 10 with comprehensive tables of data by country. The colour code of each quintile demonstrates the relative significance of mining's contribution in each national economy.

The MCI provides a reasonable first approximation of the relative importance of mining and metals to each national economy, however, as highlighted by the case study evidence above, there are many more direct and indirect potential contributions from the mining sector.

This initial index is therefore intended to prompt debate and encourage more data generation and standards, allowing the MCI to be further refined. ICMM is currently exploring opportunities with the World Bank, the International Monetary Fund, various national governments and others, for creating a more sophisticated and analytically useful version of the MCI that would support more well-informed debate about mining's developmental role.

"This initial index is intended to prompt debate and encourage more data generation and standards, allowing the MCI to be further refined."

Box 1: Methodology used for calculating the Mining Contribution Index (MCI)

The MCI is based on the following three selection variables. In their own way, each of them captures the importance of mining in the national economies of individual countries:

- **mineral export contribution 2010**
- **increase/decrease in mineral export contribution 2005-2010**
- **mineral production value as a percentage of GDP in 2010.**

The MCI is calculated as follows:

- **countries are ranked in descending order for each of the three selection variables**
- **countries for which data do not exist are omitted from the ranking. As a result, selection variables 1 and 2 are ranked out of 212 countries (the number of countries for which 2010 export data exist). Selection variable 3 is ranked out of 87 countries (the number of countries for which 2010 production data exist)**
- **percentile ranks are created for each selection variable based on the absolute country rankings, by dividing the absolute rank by the maximum rank within that variable**
- **finally, the three selection variables are weighted equally at 1/3, summed up, and multiplied by 100. If a country had the highest ranking in each selection variable, it would thus have a Mining Contribution Index score of 100.**

To reduce bias due to data being more readily available for exports (selection variables 1 and 2) than for production (selection variable 3), we calculate the index based only on selection variables 1 and 2 for those countries for which 2010 production data is not available.

Note that mineral export contributions may increase, not due to higher prices and/or output in the mining sector, but to declining prices and/or output in other export sectors (e.g. agricultural commodities). The MCI at present does not distinguish between these two effects.

Explanatory note to map and data table

The data table brings together a series of indicators related to mineral exports, mineral production and a set of descriptive country data. A detailed description of each column in the data table is provided in Table 3. The orange highlighted rows are the indicators used for the calculation of the MCI.

The MCI captures important aspects of the contribution from the non-fuel mineral sectors to national economies. The aim of the MCI is to highlight the importance of these sectors within national economies. The MCI does not reflect the contributions of individual countries to total global production, or consumption of these minerals.

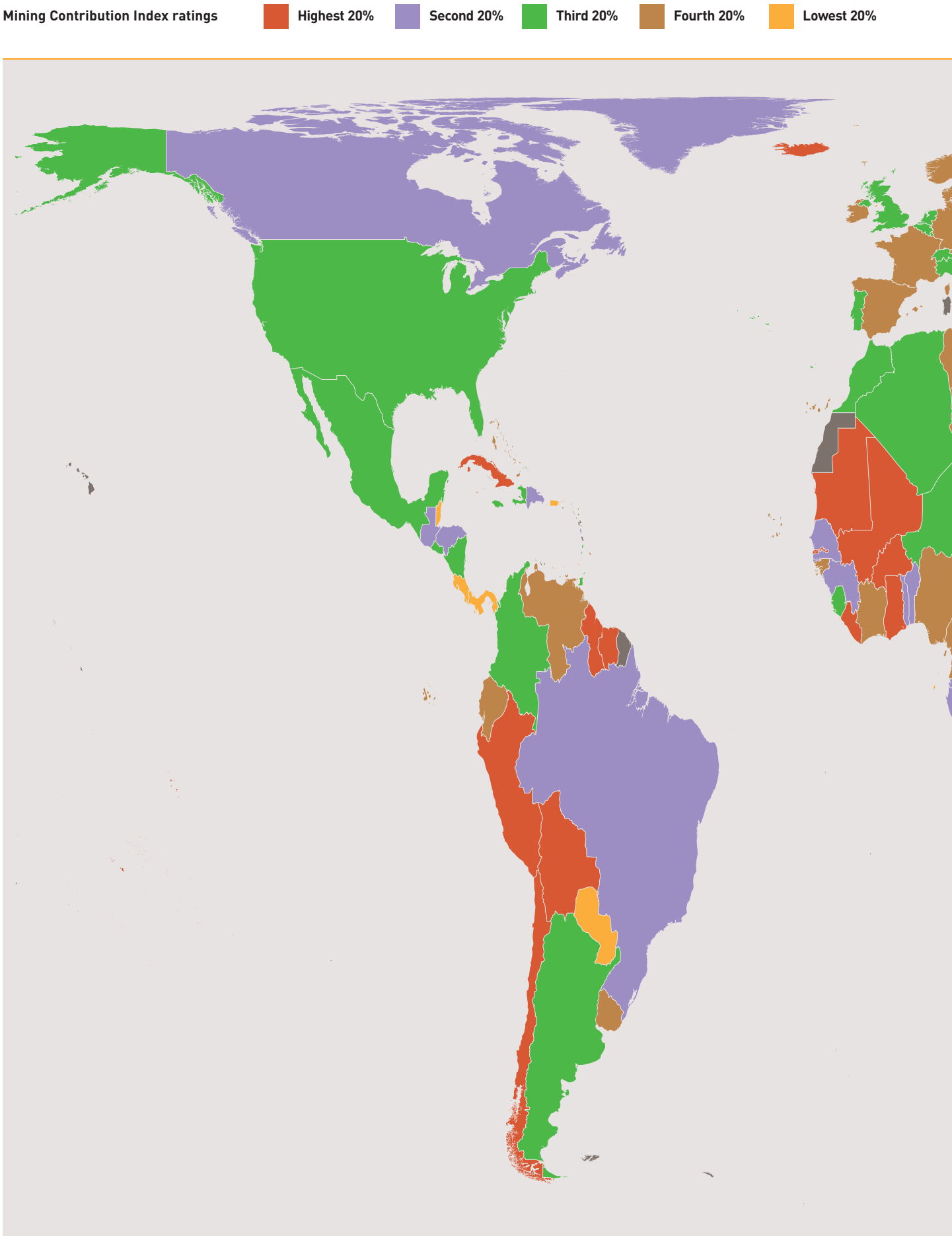
The MCI (based on the three indicators described above) is retrospective. All three indicators comprising the index are based on historical production data. This implies that countries like Afghanistan with vast mineral potential, but low current production, do not score highly in the index.

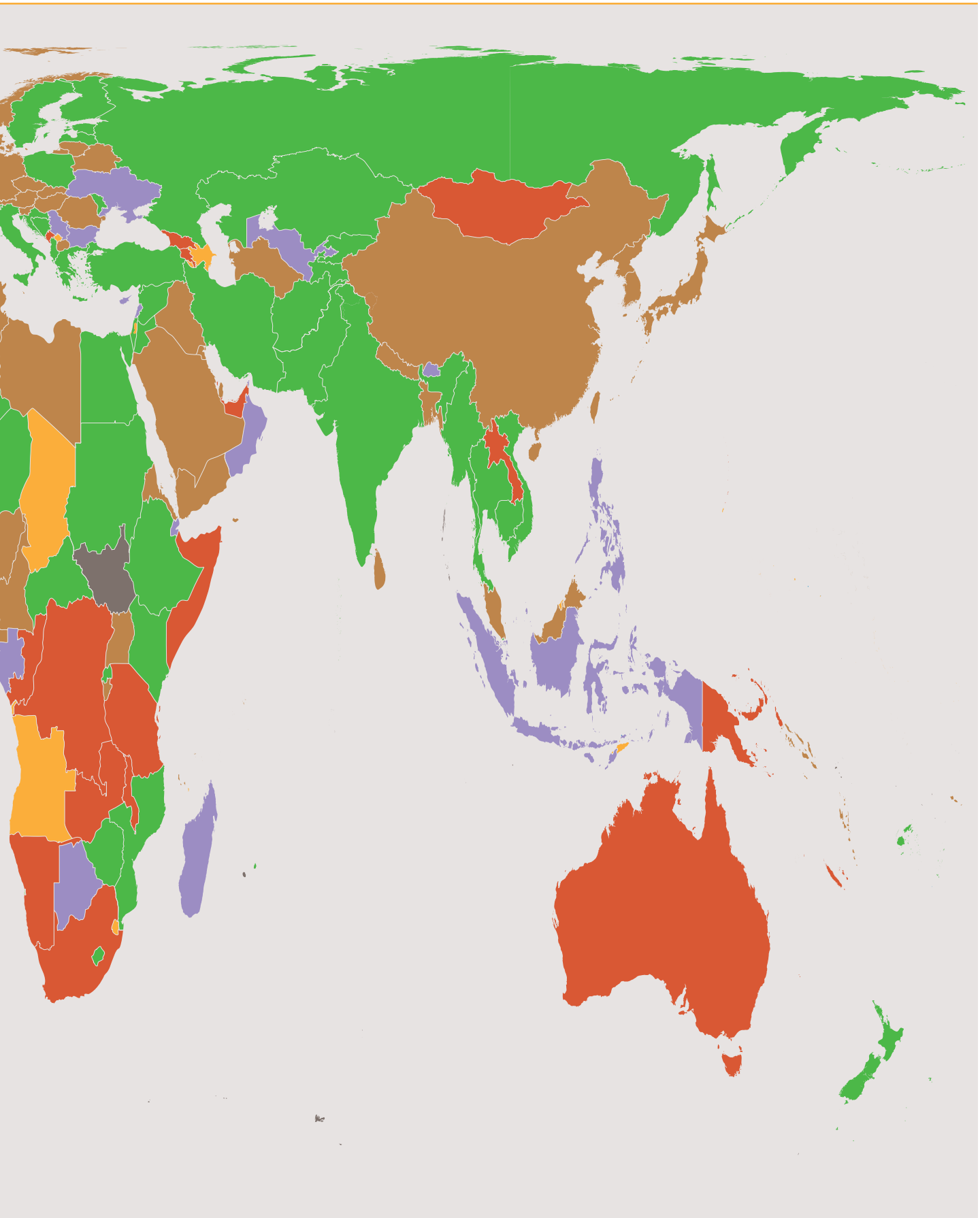
Table 3: Definition and source of indicators in MCI data table

Column	Indicator	Definition and sources
1	2010 mineral export contribution	Mineral (non-fuel) exports in 2010 as % of total merchandise exports (UNCTAD data)
2	Change in mineral export contribution 2005–2010	Column 1 less mineral (non-fuel) exports in 2005 as % of total merchandise exports (UNCTAD data)
3	Total mineral export contribution 2010	Mineral and fuel exports in 2010 as % of total merchandise exports (UNCTAD data)
4	2010 production value (US$ million)	Total production value of metallic minerals in 2010 (RMG data)
5	Change in production value 2000–2010	Change in production value of metallic minerals 2000–2010 (RMG data)
6	2010 production value as % of 2010 GDP	Column 4 divided by 2010 GDP (current USD) (World Bank data)
7	Population growth since 2000	World Bank, World Development Indicators
8	2011 Human Development Index (HDI)	World Bank data
9	Mining Contribution Index (MCI)	Sum of weighted percentile ranks across selection variables

"The MCI captures important aspects of the contribution from the non-fuel mineral sectors to national economies. The aim of the MCI is to highlight the importance of these sectors within national economies."

The role of mining in national economies





The role of mining in national economies

Mining Contribution Index ratings Highest 20% | Second 20% | Third 20% | Fourth 20% | Lowest 20%

Data table by country

	COUNTRY	EXPORTS			PRODUCTION			COUNTRY DATA		ASSESSMENT
		2010 mineral export contribution	Change in mineral export contribution 2005–2010	Total mineral export contribution 2010	2010 production value (US$ million)	Change in production value 2000–2010	2010 production value as % of 2010 GDP	Population growth since 2000	2011 Human Development Index (HDI)	Mining Contribution Index (MCI)
1	Zambia	83.6%	19.7%	84.2%	3,850	524.7%	23.8%	26.5%	0.43	97.7
2	Northern Mariana Islands	58.9%	54.4%	58.9%	–	–	–	-11.0%	–	97.6
3	Papua New Guinea	54.0%	14.8%	71.6%	3,166	136.5%	33.4%	27.5%	0.47	95.5
4	Montenegro	46.8%	46.8%	56.9%	–	–	–	-0.2%	0.77	95.3
5	Mauritania	60.4%	11.1%	72.2%	1,778	461.6%	48.9%	30.9%	0.45	95.3
6	French Polynesia	67.1%	11.9%	67.2%	–	–	–	13.9%	–	94.8
7	Mali	54.8%	17.6%	55.4%	1,445	305.2%	15.6%	36.3%	0.36	94.2
8	Iceland	42.0%	23.0%	43.1%	–	–	–	13.0%	0.90	93.6
9	Mongolia	77.6%	7.4%	87.5%	1,336	228.2%	21.5%	14.3%	0.65	93.3
10	Congo (Dem Rep)	78.3%	8.1%	90.5%	2,191	837.0%	16.7%	33.1%	0.29	93.2
11	Guyana	46.6%	16.9%	46.6%	361	42.7%	16.2%	2.9%	0.63	93.1
12	Chile	65.9%	9.4%	66.7%	31,275	199.2%	14.7%	11.0%	0.81	92.1
13	Congo, Rep.	39.1%	16.9%	39.1%	–	–	–	28.9%	0.53	91.5
14	Somalia	33.4%	28.0%	34.2%	–	–	–	26.1%	–	91.3
15	Laos	44.6%	27.8%	62.0%	865	22218.9%	11.9%	16.6%	0.52	91.1
16	Burkina Faso	40.7%	38.7%	40.7%	794	3133.6%	9.0%	34.1%	0.33	90.2
17	Cuba	47.7%	8.6%	50.7%	889	39.3%	–	1.8%	0.78	89.4
18	Georgia	33.7%	12.6%	35.7%	–	–	–	0.8%	0.73	89.2
19	Liberia	20.6%	17.9%	29.5%	–	–	–	40.3%	0.33	89.2
20	Bolivia	34.6%	15.4%	77.9%	1,935	305.8%	9.8%	19.5%	0.66	88.0
21	Peru	62.7%	4.8%	72.2%	18,832	302.2%	12.0%	12.4%	0.73	88.0
22	Australia	40.3%	13.0%	69.2%	71,995	337.8%	7.8%	16.1%	0.93	87.9
23	New Caledonia	37.9%	9.1%	38.0%	1,778	59.6%	–	19.1%	–	87.5
24	United Arab Emirates	21.8%	11.6%	64.6%	–	–	–	147.6%	0.85	86.6
25	Namibia	53.4%	12.3%	53.9%	352	278.1%	2.9%	20.4%	0.63	86.5
26	Suriname	75.4%	11.2%	79.1%	71	-37.3%	2.2%	12.4%	0.68	85.9
27	Ghana	25.4%	7.0%	28.1%	3,964	290.4%	12.7%	27.1%	0.54	84.9
28	Gambia, The	15.6%	12.3%	15.7%	–	–	–	33.3%	0.42	84.7
29	Bahrain	35.8%	3.8%	68.6%	–	–	–	97.7%	0.81	82.5
30	Tanzania	40.7%	4.3%	43.0%	1,340	499.7%	5.8%	31.8%	0.47	82.3
31	South Africa	37.4%	3.6%	47.5%	27,116	113.6%	7.5%	13.6%	0.62	81.2
32	Malawi	11.1%	10.8%	11.3%	–	–	–	33.0%	0.40	80.9
33	Armenia	50.6%	10.8%	53.5%	143	145.3%	1.5%	0.5%	0.72	80.8
34	Brazil	19.0%	8.5%	28.8%	47,027	506.5%	2.3%	12.1%	0.72	79.6
35	Bhutan	13.7%	5.3%	44.8%	–	–	–	27.1%	0.52	79.0
36	Benin	11.0%	5.2%	28.9%	–	–	–	35.8%	0.43	77.4
37	Madagascar	10.3%	5.4%	13.7%	–	–	–	34.4%	0.48	77.1
38	Togo	15.2%	3.2%	28.1%	–	–	–	25.7%	0.44	76.2
39	Cyprus	7.7%	4.9%	21.9%	–	–	–	17.0%	0.84	74.1
40	Dominica	10.2%	3.7%	10.2%	–	–	–	-2.7%	0.72	74.1
41	Lebanon	18.4%	2.2%	19.0%	–	–	–	13.0%	0.74	74.1
42	Uzbekistan	17.6%	1.4%	30.4%	2,937	141.9%	7.5%	14.2%	0.64	73.2
43	Bulgaria	17.5%	3.1%	30.1%	699	227.8%	1.5%	-6.4%	0.77	70.5
44	Philippines	6.8%	4.3%	10.6%	4,221	964.1%	2.1%	20.7%	0.64	69.9
45	Hong Kong SAR, China	7.3%	3.1%	7.5%	–	–	–	6.0%	0.90	69.3
46	Macao SAR, China	6.0%	4.0%	6.0%	–	–	–	25.9%	–	69.1
47	Senegal	8.1%	3.8%	32.4%	181	2230.0%	1.4%	30.4%	0.46	67.6
48	Greenland	7.4%	2.4%	7.4%	–	–	–	0.6%	–	67.5
49	Canada	11.9%	4.9%	35.6%	13,984	78.1%	0.9%	10.7%	0.91	67.1
50	Indonesia	10.6%	1.9%	40.2%	12,225	147.1%	1.7%	12.7%	0.62	66.4
51	Ukraine	8.2%	1.0%	15.3%	9,283	413.6%	6.7%	-6.7%	0.73	66.3
52	Oman	12.7%	11.7%	67.8%	157	1634.4%	0.3%	22.9%	0.71	65.8
53	Guinea	65.2%	-18.7%	86.4%	1,174	51.2%	26.0%	19.6%	0.34	65.3

Data table by country *continued*

	COUNTRY	EXPORTS			PRODUCTION			COUNTRY DATA		ASSESSMENT
		2010 mineral export contribution	Change in mineral export contribution 2005–2010	Total mineral export contribution 2010	2010 production value (US$ million)	Change in production value 2000–2010	2010 production value as % of 2010 GDP	Population growth since 2000	2011 Human Development Index (HDI)	Mining Contribution Index (MCI)
54	Serbia	9.7%	9.7%	14.8%	200	64.4%	0.5%	-3.0%	0.77	64.6
55	Gabon	6.8%	1.2%	85.3%	323	279.0%	2.5%	21.9%	0.67	64.2
56	Honduras	7.2%	3.2%	9.5%	181	158.9%	1.2%	22.2%	0.63	63.9
57	Djibouti	14.5%	0.9%	24.1%	–	–	–	21.4%	0.43	63.7
58	Dominican Republic	5.5%	2.8%	6.6%	–	–	–	15.5%	0.69	63.7
59	Botswana	83.7%	-2.8%	84.0%	741	237.6%	5.0%	14.2%	0.63	61.9
60	Guatemala	5.1%	4.2%	9.6%	452	–	1.1%	28.6%	0.57	60.7
61	Nicaragua	5.2%	1.2%	6.4%	143	206.6%	2.2%	14.1%	0.59	59.7
62	Colombia	7.2%	2.5%	63.8%	2,405	231.8%	0.8%	16.3%	0.71	59.4
63	Ethiopia	8.9%	3.2%	8.9%	143	83.9%	0.5%	26.4%	0.36	59.1
64	Zimbabwe	26.8%	-10.2%	31.1%	1,098	154.4%	14.7%	0.8%	0.38	58.7
65	Syrian Arab Republic	4.3%	2.0%	39.9%	–	–	–	27.5%	0.63	58.5
66	Switzerland	5.6%	1.3%	8.3%	–	–	–	8.9%	0.90	58.0
67	Morocco	11.2%	3.1%	15.2%	190	-22.5%	0.2%	11.1%	0.58	57.7
68	Kyrgyz Republic	18.8%	-15.2%	31.4%	670	144.7%	14.5%	9.2%	0.62	56.9
69	Albania	15.2%	6.9%	29.0%	5	-54.0%	0.0%	4.3%	0.74	56.5
70	Kenya	4.3%	1.5%	8.6%	–	–	–	29.4%	0.51	56.1
71	Niger	19.4%	0.1%	30.5%	71	1003.7%	1.3%	42.2%	0.30	55.9
72	El Salvador	3.6%	2.1%	5.8%	–	–	–	4.3%	0.67	55.9
73	Aruba	3.2%	2.4%	35.6%	–	–	–	19.1%	–	55.7
74	Mexico	4.9%	2.9%	18.7%	8,361	244.6%	0.8%	13.0%	0.77	55.5
75	Myanmar	5.4%	1.2%	38.1%	62	13.9%	–	6.7%	0.48	55.4
76	Egypt, Arab Rep.	9.9%	7.0%	38.6%	114	115.4%	0.1%	20.0%	0.64	55.4
77	Turkey	6.1%	3.5%	10.0%	2,039	365.6%	0.3%	14.5%	0.70	55.4
78	Turks and Caicos Islands	3.0%	2.9%	3.4%	–	–	–	103.2%	–	55.2
79	Sweden	5.3%	2.0%	12.3%	3,974	275.5%	0.9%	5.8%	0.90	54.9
80	Iran, Islamic Rep.	3.7%	1.5%	85.5%	4,387	446.8%	1.3%	13.3%	0.71	54.7
81	Kazakhstan	13.1%	-1.6%	84.8%	7,248	203.3%	4.9%	9.4%	0.75	54.0
82	Bermuda	2.8%	2.4%	21.9%	–	–	–	4.0%	–	53.3
83	Trinidad and Tobago	2.8%	2.3%	70.8%	–	–	–	3.8%	0.76	52.4
84	Belgium	7.9%	0.3%	16.7%	–	–	–	5.8%	0.89	52.1
85	United Kingdom	5.9%	0.6%	18.5%	–	–	–	5.6%	0.86	52.1
86	Cambodia	3.0%	1.7%	3.0%	–	–	–	13.7%	0.52	51.9
87	Finland	5.6%	2.1%	13.6%	680	369.7%	0.3%	3.6%	0.88	51.9
88	Jamaica	49.6%	-19.0%	63.5%	219	-38.0%	1.5%	4.4%	0.73	51.7
89	Sierra Leone	54.3%	-3.9%	55.0%	24	–	1.2%	41.6%	0.34	51.3
90	Argentina	4.8%	1.2%	14.3%	3,028	357.7%	0.8%	9.5%	0.80	51.0
91	Italy	3.1%	1.4%	8.0%	–	–	–	6.3%	0.87	50.5
92	India	17.9%	-1.9%	32.0%	26,042	788.8%	1.5%	14.7%	0.55	50.3
93	Thailand	6.0%	3.0%	8.7%	337	668.3%	0.1%	9.3%	0.68	49.9
94	United States	6.2%	2.0%	12.6%	22,957	104.0%	0.2%	9.6%	0.91	49.8
95	Croatia	4.6%	0.8%	17.0%	–	–	–	0.0%	0.80	49.8
96	St. Vincent and the Grenadines	2.2%	2.0%	2.7%	–	–	–	1.3%	0.72	49.8
97	Tonga	2.3%	1.9%	2.3%	–	–	–	6.3%	0.70	49.5
98	Sudan	5.7%	2.7%	94.2%	76	1.5%	0.1%	27.5%	0.41	49.4
99	Mozambique	57.0%	-9.9%	72.0%	–	–	–	28.6%	0.32	49.3
100	St. Lucia	2.3%	1.7%	31.3%	–	–	–	11.5%	0.72	48.8
101	Luxembourg	5.8%	0.4%	7.9%	–	–	–	15.9%	0.87	48.6
102	Netherlands	3.6%	0.9%	17.9%	–	–	–	4.4%	0.91	47.9
103	Algeria	4.1%	3.6%	98.4%	195	296.9%	0.1%	16.4%	0.70	47.8
104	Russian Federation	6.6%	-0.6%	75.6%	28,680	166.1%	1.9%	-2.7%	0.76	47.6
105	Maldives	2.3%	1.4%	2.3%	–	–	–	15.6%	0.66	47.4
106	Moldova	3.1%	1.0%	4.6%	–	–	–	-2.1%	0.65	47.4

The role of mining in national economies

Mining Contribution Index ratings Highest 20% | Second 20% | Third 20% | Fourth 20% | Lowest 20%

Data table by country *continued*

COUNTRY		EXPORTS			PRODUCTION			COUNTRY DATA		ASSESSMENT
		2010 mineral export contribution	Change in mineral export contribution 2005–2010	Total mineral export contribution 2010	2010 production value (US$ million)	Change in production value 2000–2010	2010 production value as % of 2010 GDP	Population growth since 2000	2011 Human Development Index (HDI)	Mining Contribution Index (MCI)
107	Greece	9.5%	1.2%	20.5%	285	-8.0%	0.1%	3.7%	0.86	47.2
108	Poland	4.7%	0.7%	8.7%	3,051	120.7%	0.7%	-0.8%	0.81	45.9
109	Latvia	4.0%	0.5%	7.6%	–	–	–	-5.4%	0.81	45.5
110	Central African Republic	35.8%	-9.0%	36.6%	–	–	–	18.9%	0.34	45.5
111	Tajikistan	18.8%	-38.5%	22.3%	76	96.2%	1.3%	11.4%	0.61	45.5
112	Haiti	1.9%	1.2%	1.9%	–	–	–	15.6%	0.45	45.3
113	Israel	33.5%	-5.1%	33.7%	–	–	–	21.2%	0.89	45.3
114	Rwanda	27.4%	-12.4%	28.4%	52	6.5%	0.9%	30.9%	0.43	44.5
115	Portugal	4.1%	1.3%	10.8%	390	135.7%	0.2%	3.9%	0.81	44.4
116	Vietnam	2.4%	1.7%	18.1%	371	282.6%	0.3%	12.0%	0.59	44.0
117	Bosnia and Herzegovina	16.2%	-6.8%	26.8%	157	1248.9%	0.9%	1.8%	0.73	43.6
118	Mauritius	3.3%	0.5%	3.4%	1,778	461.6%	18.3%	7.9%	0.73	43.4
119	New Zealand	5.4%	0.4%	10.1%	656	223.4%	0.5%	13.2%	0.91	43.2
120	Lesotho	10.8%	-1.0%	10.8%	–	–	–	10.6%	0.45	43.2
121	Fiji	4.2%	-2.4%	11.6%	71	49.1%	2.2%	6.0%	0.69	43.0
122	Estonia	3.0%	0.6%	18.7%	–	–	–	-2.2%	0.84	42.7
123	Singapore	2.9%	0.7%	19.4%	–	–	–	26.0%	0.87	42.7
124	Pakistan	1.6%	1.1%	7.2%	–	–	–	20.0%	0.50	42.0
125	Jordan	9.8%	-1.1%	10.7%	–	–	–	26.0%	0.70	41.7
126	Afghanistan	7.0%	-0.5%	9.8%	–	–	–	32.3%	0.40	40.6
127	France	2.8%	0.5%	6.4%	–	–	–	6.7%	0.88	40.3
128	Slovak Republic	3.0%	0.4%	7.8%	–	–	–	0.8%	0.83	39.9
129	Malta	1.3%	0.9%	1.8%	–	–	–	5.9%	0.83	39.4
130	Burundi	14.6%	-12.6%	16.3%	–	–	–	31.5%	0.32	38.9
131	St. Kitts and Nevis	1.0%	1.0%	1.1%	–	–	–	18.3%	0.74	38.9
132	Denmark	1.9%	0.5%	11.0%	–	–	–	3.9%	0.90	38.2
133	Norway	6.4%	0.4%	70.5%	333	140.7%	0.1%	8.8%	0.94	37.8
134	Turkmenistan	1.1%	0.9%	75.3%	–	–	–	12.0%	0.69	37.5
135	Bahamas, The	3.3%	0.1%	41.9%	–	–	–	15.2%	0.77	37.0
136	Czech Republic	2.0%	0.4%	5.4%	–	–	–	1.9%	0.87	36.3
137	Japan	3.5%	1.4%	5.2%	271	38.0%	0.0%	0.0%	0.90	36.2
138	Cape Verde	0.9%	0.8%	0.9%	–	–	–	13.4%	0.57	35.4
139	Sri Lanka	6.2%	-2.4%	6.3%	–	–	–	11.8%	0.69	35.4
140	Barbados	1.1%	0.6%	12.2%	–	–	–	2.2%	0.79	35.1
141	Korea, Dem. Rep.	7.3%	-6.0%	16.9%	304	124.2%	–	6.1%	–	35.1
142	Ecuador	1.5%	0.8%	57.7%	128	154.7%	0.2%	17.9%	0.72	34.5
143	Equatorial Guinea	0.8%	0.8%	95.5%	–	–	–	34.6%	0.54	34.2
144	Germany	3.7%	1.0%	5.5%	43	231.1%	0.0%	-0.6%	0.91	33.6
145	Venezuela, RB	3.7%	-0.5%	87.9%	2,239	193.2%	0.6%	18.5%	0.74	33.6
146	Eritrea	2.6%	0.1%	2.6%	–	–	–	43.2%	0.35	33.5
147	Malaysia	2.2%	0.9%	18.1%	209	60.3%	0.1%	21.4%	0.76	33.4
148	Spain	3.4%	0.8%	6.7%	261	-25.9%	0.0%	14.4%	0.88	33.4
149	American Samoa	5.5%	-3.0%	6.5%	–	–	–	18.7%	–	32.3
150	Korea, Rep.	3.0%	1.2%	10.4%	10	-56.7%	0.0%	4.0%	0.90	32.1
151	Austria	3.3%	0.5%	5.7%	166	179.9%	0.0%	4.7%	0.89	32.1
152	China	1.5%	-0.5%	3.2%	69,281	555.1%	1.2%	6.3%	0.69	32.0
153	Cote d'Ivoire	0.8%	0.3%	33.4%	181	351.0%	0.8%	18.7%	0.40	31.3
154	Slovenia	4.0%	-0.8%	7.5%	–	–	–	3.2%	0.88	31.1
155	Uganda	5.4%	-4.0%	6.3%	–	–	–	38.0%	0.45	30.7
156	Libya	1.0%	0.4%	97.0%	–	–	–	21.5%	0.76	30.4
157	Tunisia	1.9%	0.7%	17.2%	24	-51.6%	0.1%	9.8%	0.70	30.3
158	Ireland	1.2%	0.3%	2.3%	504	74.1%	0.2%	17.8%	0.91	30.0
159	Macedonia, FYR	0.0%	0.0%	0.0%	190	219.9%	2.1%	2.6%	0.73	30.0

Data table by country *continued*

	COUNTRY	EXPORTS			PRODUCTION			COUNTRY DATA		ASSESSMENT
		2010 mineral export contribution	Change in mineral export contribution 2005–2010	Total mineral export contribution 2010	2010 production value (US$ million)	Change in production value 2000–2010	2010 production value as % of 2010 GDP	Population growth since 2000	2011 Human Development Index (HDI)	Mining Contribution Index (MCI)
160	Iraq	0.6%	0.4%	99.1%	–	–	–	31.7%	0.57	29.5
161	Cayman Islands	0.5%	0.4%	5.2%	–	–	–	39.9%	–	29.0
162	Nigeria	1.2%	1.0%	91.7%	33	51.5%	0.0%	27.4%	0.46	28.6
163	Nepal	4.1%	-3.2%	4.1%	–	–	–	23.0%	0.46	28.3
164	Qatar	0.6%	0.4%	90.8%	–	–	–	197.6%	0.83	28.3
165	Marshall Islands	0.4%	0.4%	4.5%	–	–	–	3.6%	–	28.1
166	Romania	4.2%	0.0%	9.5%	19	-80.9%	0.0%	-4.5%	0.78	27.8
167	Cameroon	3.7%	-1.2%	52.8%	38	194.3%	0.2%	24.8%	0.48	27.7
168	Guinea-Bissau	0.9%	0.2%	7.1%	–	–	–	22.1%	0.35	27.6
169	Tuvalu	0.8%	0.2%	3.5%	–	–	–	4.3%	–	27.4
170	Belarus	0.7%	0.2%	28.8%	–	–	–	-5.1%	0.76	25.7
171	Kuwait	0.9%	0.1%	90.9%	–	–	–	41.0%	0.76	25.5
172	Faeroe Islands	0.3%	0.3%	2.1%	–	–	–	6.5%	–	25.2
173	Hungary	1.8%	-0.1%	4.5%	–	–	–	-2.0%	0.82	25.2
174	Uruguay	1.8%	0.0%	3.2%	62	127.7%	0.2%	1.7%	0.78	24.6
175	Vanuatu	0.3%	0.3%	1.2%	–	–	–	29.5%	0.62	24.3
176	Bangladesh	0.4%	0.2%	1.1%	–	–	–	14.6%	0.50	24.1
177	Comoros	1.2%	0.0%	1.2%	–	–	–	30.6%	0.43	24.1
178	Samoa	0.3%	0.2%	0.3%	–	–	–	3.7%	0.69	24.1
179	Lithuania	1.4%	-0.1%	24.8%	–	–	–	-5.1%	0.81	23.8
180	Saudi Arabia	0.9%	0.4%	85.2%	171	231.1%	0.0%	37.0%	0.77	23.1
181	Solomon Islands	0.5%	0.1%	0.5%	–	–	–	31.7%	0.51	22.9
182	Yemen, Rep.	0.7%	0.0%	90.8%	–	–	–	36.2%	0.46	22.9
183	Seychelles	0.4%	0.1%	12.2%	–	–	–	6.6%	0.77	22.2
184	Antigua and Barbuda	0.1%	0.1%	0.2%	–	–	–	14.2%	0.76	21.5
185	Brunei Darussalam	0.1%	0.1%	97.5%	–	–	–	22.0%	0.84	20.3
186	Swaziland	1.5%	-1.8%	1.8%	–	–	–	11.5%	0.52	19.8
187	Costa Rica	0.8%	-0.3%	1.2%	–	–	–	18.9%	0.74	18.9
188	Panama	1.6%	-2.9%	1.6%	–	–	–	19.0%	0.77	18.9
189	Paraguay	0.8%	-0.4%	0.9%	–	–	–	20.8%	0.67	18.9
190	Chad	0.1%	0.0%	90.9%	–	–	–	36.2%	0.33	18.4
191	Gibraltar	1.6%	-3.8%	86.6%	–	–	–	6.9%	–	18.2
192	Angola	1.1%	-2.1%	99.7%	–	–	–	37.4%	0.49	17.2
193	Sao Tome and Principe	0.2%	-0.2%	0.2%	–	–	–	17.3%	0.51	15.6
194	Mayotte	0.0%	0.0%	0.3%	–	–	–	37.2%	–	14.9
195	Timor-Leste	0.2%	-0.3%	74.7%	–	–	–	35.4%	0.50	14.6
196	Belize	0.0%	0.0%	34.5%	–	–	–	38.0%	0.70	14.6
197	Grenada	0.1%	-0.2%	0.3%	–	–	–	2.9%	0.75	14.6
198	Palau	0.2%	-0.7%	0.2%	–	–	–	6.8%	0.70	13.4
199	Azerbaijan	0.3%	-3.4%	91.3%	67	-	0.1%	12.4%	0.78	13.3
200	Channel Islands	0.0%	0.0%	0.0%	–	–	–	5.5%	–	12.3
201	Isle of Man	0.0%	0.0%	0.0%	–	–	–	7.9%	–	12.3
202	Kosovo	0.0%	0.0%	0.0%	–	–	–	6.8%	–	12.3
203	Liechtenstein	0.0%	0.0%	0.0%	–	–	–	9.7%	0.91	12.3
204	Monaco	0.0%	0.0%	0.0%	–	–	–	0.8%	–	12.3
205	Puerto Rico	0.0%	0.0%	0.0%	–	–	–	4.3%	–	12.3
206	San Marino	0.0%	0.0%	0.0%	–	–	–	16.9%	–	12.3
207	Virgin Islands (U.S.)	0.0%	0.0%	0.0%	–	–	–	1.0%	–	12.3
208	West Bank and Gaza	0.0%	0.0%	0.0%	–	–	–	38.2%	–	12.3
209	Kiribati	0.0%	-0.8%	0.7%	–	–	–	18.5%	0.62	11.1
210	Micronesia, Fed. Sts.	0.1%	-1.4%	0.1%	–	–	–	3.7%	0.64	10.6
211	Andorra	0.0%	-2.2%	0.0%	–	–	–	31.3%	0.84	8.5
212	Guam	0.0%	-9.4%	0.6%	–	–	–	16.0%	–	4.7

Economic benefits of mineral production

A fuller understanding of the different components of mining's production value can help to illustrate the types of benefits that the sector can generate, how these benefits may be captured, as well as policy options to increase local economic linkages with mining.

The value of mining's contribution depends on the overall value of production and the payments to production factors including financial capital, equipment, land and labour. As compensation for these factors of production, mining companies pay suppliers of goods and services, wages and salaries to workers, and interest to loan providers. Companies must also pay a minimum risk-adjusted return to shareholders (whether foreign or domestic) in the form of dividends or capital appreciation – to reward them for investing in risky, long-term mining assets.

The surplus value that remains once all of these factors of production have been compensated is referred to as the rent from mineral resources. In broad terms these rents are allocated between the host government and company investors in a manner depending on the fiscal regime in place.

Greater integration of mining, through various forms of linkages, holds promise for increasing mining's contribution to national economies at each stage of the value chain. The extent and nature of these contributions, however, will vary depending on country-specific circumstances. For example, in many poorer countries the absence of quality suppliers prevents mining companies from procuring domestically. Table 4 shows the main components of production value, their composition and some of the key determinants of whether contributions from mining will be captured within the national economy.

The composition of production value is an important guide to the economic benefits that mining could potentially make to the national economy. The components represented by rows 1 and 2 are areas where mining contributes to economic development directly. The company's operating expenditures reflect revenues captured by local suppliers, which contributes to GDP, especially where these inputs are manufactured domestically (row 1). Salaries for workers represent a direct contribution to the country's GDP (row 2) split between household income and salary withholding taxes.

The profits of the mining companies themselves (row 6) represent an additional contribution to GDP, as do the taxes generated by companies (row 4). Where the company is foreign-owned, some of the profits may however be repatriated, in which case an assessment of mining contributions to Gross National Income (GNI) rather than GDP will better capture the benefits accruing to the host country.

Table 4: Main components of production value

Main components of production value	Examples	Key factors determining contribution to the national economy
1 Operating expenditures	Consumables (fuel, power, tyres, reagents, water, transport); light engineering works	Availability of local supply capacity; infrastructure; enabling business environment; industrial policy
2 Salaries and wages	After-tax payment to labour providers; salary withholding taxes	Local educational attainment; availability of suitable skills; education policy
3 Capital expenditures (investment and depreciation)	Machines and equipment	Sophistication of host country industrial base
4 Taxes	Royalties; corporation tax; variable profits taxes	Fiscal regime and revenue sharing; strength and transparency of public sector financial management (expenditures)
5 Financing costs	Interest payments on short and long-term loans	Strength of domestic financial sector
6 Profit for shareholders	Dividends to shareholders (includes both private and government investors); share buy-backs; retained earnings	Degree of national ownership of mining sector (direct or through government shareholdings)

3. Understanding the full project life cycle

Figure 2 shows the full mine project life cycle and is roughly indicative of activity and mine-related employment. The hypothetical example relates to a discovery in the 1950s, development in the 1960s, operations for 20 to 30 years until the mid-1990s, and then closure. Figure 3 is the historic profile of the price of copper from 1950 to 2012.

The two schematics are roughly synchronous. Together they serve to demonstrate the danger in short-term thinking and the need for considering a long time horizon in mine-related planning, whether it is from the perspective of the mine, the community or government.

The short- and long-term variations in price shown are a fact of life for mine project planning – and also for those concerned with community and regional planning in the host country. The macro-economic insights that follow must keep these variations in mind to ensure that a complete picture is understood by all involved.

Figure 2: The mine project life cycle

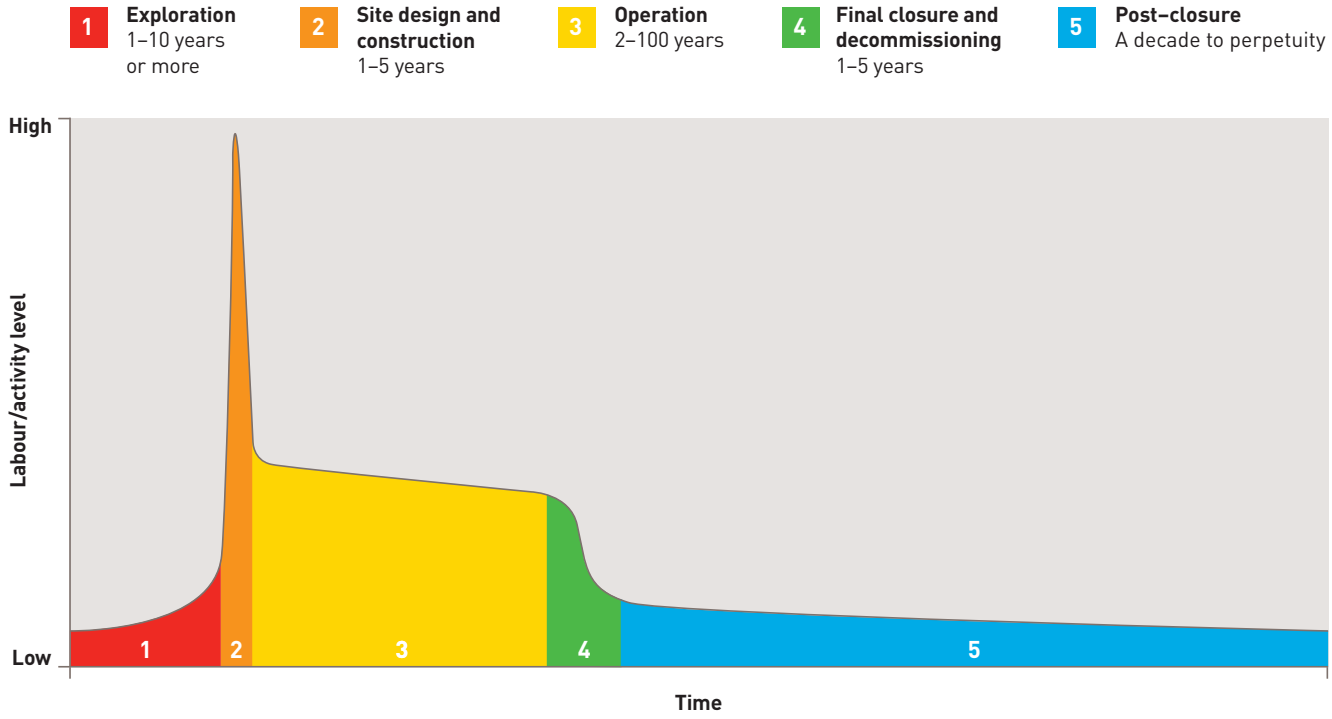
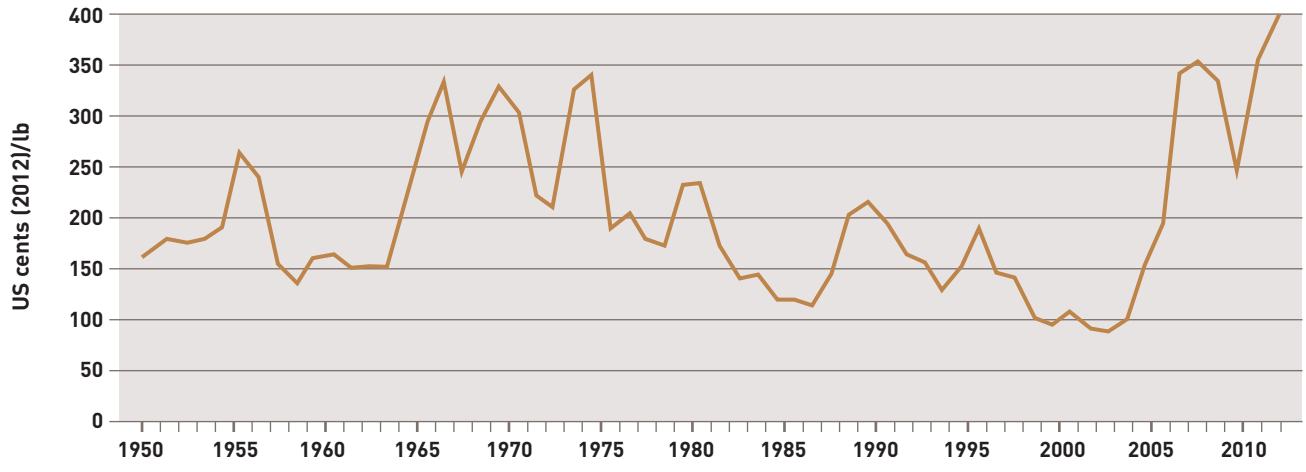


Figure 3: Copper price, 1950–2012



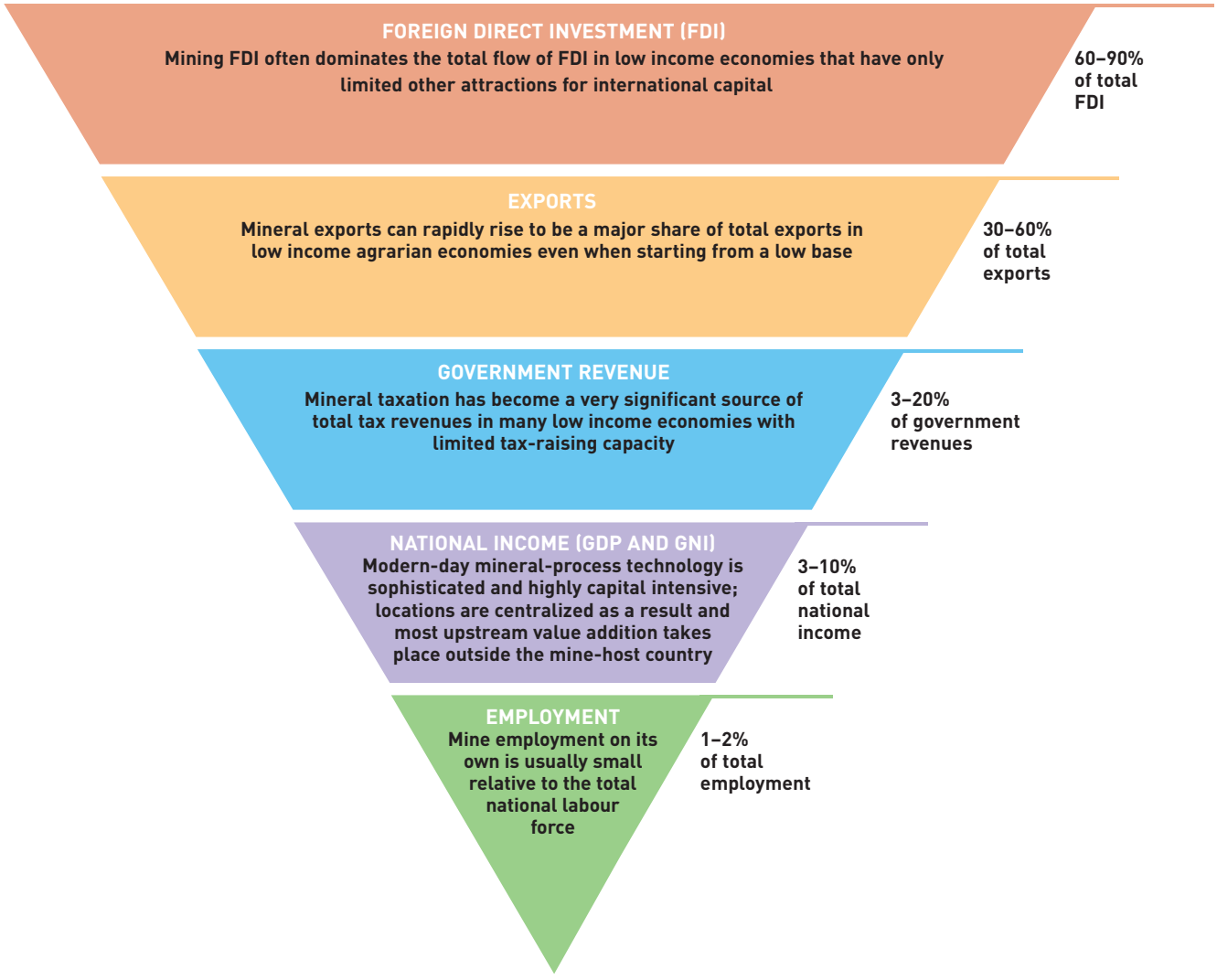
4. Special insights for low and middle income economies

The main areas of mining's large, direct economic benefits in most low and middle income countries are shown in Figure 4. The top line demonstrates that the greatest benefit mining affords to these national economies is not government revenue, but rather the contribution to foreign direct investment (up to 90%).

Note that the top four segments of contribution (foreign direct investment, exports, government revenue and national income measured by GDP) accrue to national governments. Only the smallest contribution, employment, can be said to directly benefit local communities.

"The greatest benefit mining affords to these national economies is not government revenue, but rather the contribution to foreign direct investment."

Figure 4: Macroeconomic contributions to low and middle income economies



Source: ICMM (various years) and OPM (various years).
Note: The percentages are not additive but indicate the range of stand-alone contribution of each segment.

Mining, development, and poverty reduction

Drawing on economic data available on mining sector contributions to national economies, several conclusions can be drawn regarding the sector's contribution to poverty reduction in low and middle income countries.

1. There is a growing economic contribution by the mining and metals industry to many low and middle income countries.
The rapid expansion of mining activity in recent years has made many low and middle income countries more reliant on mining for generating foreign exchange earnings. The rising importance of mining challenges both the critics of mining and its supporters to improve their understanding of the mechanisms that allow mining to have increasingly positive developmental effects. Mining in recent years has been the single most dynamic component of many poorer countries' total productive activity. Thus it has become a potential source of both direct and indirect incomes and a potential catalytic force for faster overall economic growth. In many countries, the mining and metals industry can and should be recognized as an important potential contributor to the critical policy objectives of both job creation and poverty reduction.

2. Smaller low or middle income countries score relatively highly in the Mining Contribution Index (MCI).
This is because of the high ratio with respect to the three variables used to calculate the index: share of mineral exports in total exports, rate of growth in mineral exports relative to other sectors and mineral production values as a percentage of GDP. At present, the degree of domestic upstream beneficiation is not accounted for in the MCI due to lack of data availability. If this indicator were included as a contribution from the sector, however, developed economies would score more highly on the MCI.

3. From a global production perspective, the most significant players in terms of mining and metals are large developed countries and middle income countries.
Countries that are currently home to the largest mineral and metal resources fall into two major categories: traditional producers such as Australia and the US and major emerging economies including Brazil, Russia, India, China, and South Africa (BRICS). The top 20 countries in terms of the absolute value of their mineral production have a very limited overlap with the top 20 countries in terms of mineral export contributions to total exports: the latter group are mostly small and poor developing countries.

4. The past decade has seen a major change in the relative importance of different countries among the top mineral producers.
In particular, some former poorer but now emerging economies, e.g. Brazil, Russia, India and China, have seen an increase, while South Africa has seen a decline in its status. Other richer economies, including the US and Canada have seen reductions of their share. Of course the countries that have gained market share in the past decade are far more diversified in production terms than the lower income countries that rely heavily on exports. So while they have gained in terms of global shares of mineral production, most of them remain below the "critical" value of 25% used to define a reliance on mineral exports. Nonetheless, case study results show that in the poorer regions of some emerging economies, mining poses the same basic challenges as in poorer countries. At the same time though, it can offer similar exciting opportunities – see Brazil case study (ICMM 2012), which looks in detail at south-east Pará state in Northern Brazil.

5. Even in countries where mining and metals play a major role, there can be large discrepancies in the benefits that accrue at the national level and the benefits at the local level.
Mining's economic footprint is significant. It puts pressure on local infrastructure and public services following the large scale in-migration that often occurs as mine development and operation proceeds. Targeted actions to build public sector capacity at the local level and to promote regional development initiatives are particularly important and necessary in this context, especially when mining is introduced into areas managed by small and poorly-resourced local government authorities (ICMM, 2012). Targeted actions should also focus on strengthening the local indirect economic benefits of mining, by integrating the sector more closely with the rest of the economy.

A policy approach to mining that involves systematic and co-ordinated efforts – across various areas of public policy – is needed to ensure that the direct effects are expanded mainly by redirecting the huge contributions that mining makes at the national level. ICMM's case study work has shown that a range of partnership initiatives contribute greatly to the enhancement of mining's contribution to poverty reduction (see ICMM 2009b). For example, by engaging in partnerships and sharing information on expected investment, mining companies can take an active role in promoting the development of local suppliers.

6. Significant effort is needed – particularly in optimizing local procurement and planning – to convert potential income and welfare benefits arising from the large "cash costs" of operations into actual local benefits.
There are large absolute values of spending by the mining sector on the "cash costs" – the on-going operating expenditures – involved in their operations. These levels of spending represent potential benefits that can most easily be captured by local stakeholders who provide labour and supplies. However, in all cases there will be considerable work required to convert potential income and welfare benefits into actual benefits. Specifically, there is a need to optimize local procurement and planning by aligning supplier development policy with governments' industrial and education policy.

The International Council on Mining and Metals (ICMM) was established in 2001 to improve sustainable development performance in the mining and metals industry. Today, it brings together many of the world's largest mining and metals companies as well as national and regional mining associations and global commodity associations. Our vision is one of leading companies working together and with others to strengthen the contribution of mining, minerals and metals to sustainable development.

ICMM
35/38 Portman Square
London W1H 6LR
United Kingdom

Phone: +44 (0) 20 7467 5070
Fax: +44 (0) 20 7467 5071
Email: info@icmm.com

www.icmm.com

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