

Oxford Policy Management

# Blessing or curse?

The rise of mineral dependence  
among low- and middle-income  
countries

Report

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# About OPM

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# Contents

<b>2</b>	Preface
<b>3</b>	Executive summary
<b>5</b>	About our study
<b>9</b>	Mineral dependence trends
<b>15</b>	Map of fuel- and non-fuel, mineral-dependent countries
<b>17</b>	Countries at risk of the resource curse
<b>21</b>	Policy implications for at-risk countries
<b>25</b>	Appendix
<b>33</b>	Bibliography
<b>34</b>	About the author
<b>35</b>	Contact us

# Preface

Many mineral-rich countries have turned their natural wealth to their social and economic advantage yet many others have suffered from the so-called 'resource curse', reflected in sluggish economic growth, corruption and other problems. Although this 'curse' is not a new phenomenon, its potential to become more widespread and more deeply entrenched has increased significantly in recent years as rising commodity prices have encouraged many countries to become more dependent on exports of minerals. As mounting economic uncertainty puts downward pressure on commodity prices, many of these countries – which are predominantly low- and middle-income countries – could be dangerously exposed.

This report, which is produced by Oxford Policy Management's Extractive Industries team, analyses the recent evolution of mineral dependence among low- and middle-income countries, including their relative vulnerability to the resource curse. Based on the International Monetary Fund's (IMF) definition of export dependence, we define a country as mineral-dependent if minerals account for 25% or more of the value of its merchandise exports. These minerals can either be non-fuel minerals such as iron ore, copper and gold or fuel-based minerals such as oil, gas and coal.

Specifically, our report addresses three key questions:

- How has mineral dependence changed among low- and middle-income countries since 1996 and, in particular, since commodity prices started to rise steeply in 2004?
- Does mineral dependence necessarily limit a country's economic and institutional development and make it vulnerable to the resource curse?
- What can mineral-dependent countries, their donors and other stakeholders do to prevent natural resources from becoming a curse and, instead, turn them into a blessing?



25%

A country is defined as mineral dependent if minerals account for 25% or more of its tangible exports.

## Executive summary

**The number of low- and middle-income countries<sup>1</sup> that depend on minerals for more than 25% of their tangible exports – defined as ‘mineral-dependent’ countries – increased by more than 30% between 1996 and 2010, from 46 to 61 countries.**

- Over this period, seven low- and middle-income countries became dependent on non-fuel minerals including: Montenegro, Guyana, Laos, Burkina Faso, Bolivia, Georgia, Somalia and Ghana.
- Six low- and middle-income countries became dependent on fuel-based minerals including: Belarus, Belize, Chad, Cote d'Ivoire, Myanmar and Timor-Leste.
- By 2010, more 80% of non-fuel, mineral-dependent states were low- and middle-income countries, compared to about 70% of fuel-dependent countries.
- Overall, 45 countries depend on fuel-based minerals and 40 countries depend on non-fuel minerals, nearly half of which are in Africa.

**The level of dependence among non-fuel, mineral-dependent countries has increased sharply since the boom in commodity prices started in 2004.**

- For many low- and middle-income countries, the biggest increases in non-fuel, mineral dependence over the last 15 years have occurred during the last five years, between 2005 and 2010.
- Since 2005, more than 75% of non-fuel, mineral-dependent countries have become more dependent on minerals.
- In 14 of those countries, mineral dependence has increased by more than 25 percentage points since 2005. In Burkina Faso, for example, the mining sector accounted for 2% of exports in 2005, but by 2010 its share had risen to 41%. Over the same period, the relative size of the mining sector in Laos more than doubled from 17% of exports to 45%.

**Non-fuel, mineral-dependent countries are more likely to have lower economic development than other countries, including countries dependent on oil and other fuel minerals.**

- We found a strong negative correlation between non-fuel mineral dependence and GDP per capita. In contrast, there was little correlation between fuel dependence and GDP per capita.
- Excluding Botswana and Chile – both of which have well-established and long-running mining sectors – the average, annual GDP per capita of the top-20, non-fuel, mineral-dependent countries was \$3,200 in 2009. The top-20 countries with the lowest GDP per capita included the Democratic Republic of Congo (\$319), Sierra Leone (\$808) and Mozambique (\$885).

<sup>1</sup> We follow the World Bank's classification of low- and middle-income countries, based on thresholds of Gross National Income (GNI).

**Countries that depend on either non-fuel or fuel minerals are also more likely than other countries to suffer from institutional governance problems such as corruption and political instability.**

- We found a significant, negative correlation between institutional development, measured by the World Bank's Worldwide Governance Indicators (WGI), and countries that are dependent on either fuel or non-fuel minerals. In other words, mineral dependence tends to be associated with poor institutional governance.
- Mineral-dependent countries with the weakest governance indicators include Guinea, Sudan and Democratic Republic of Congo.

**More than 20 mineral-dependent countries are especially vulnerable to the 'resource curse' – the risk that substantial changes in commodity prices will severely affect their development.**

- Non-fuel, mineral-dependent countries that are most at risk of the resource curse include: Bolivia, Burkino Faso, the DRC, Ghana, Guyana, Laos, Mali, Mauritania, Mongolia, Papua New Guinea, Tanzania and Zambia.
- Fuel-dependent countries that are most vulnerable include: Angola, Cameroon, Chad, Cote d'Ivoire, Iran, Iraq, Nigeria, Sudan, Timor-Lieste and Yemen.
- Many other countries could find themselves in difficulties, including high-income countries.

**To avoid the resource curse and turn mineral dependence to their advantage, countries and other stakeholders need to take the following steps.**

- Understand and manage the macroeconomic impacts of large inflows of foreign exchange, particularly the effects on the real exchange rate.
- Use mineral receipts to invest in productive assets that will have multiplier effects, such as infrastructural projects.
- Integrate extractive industries more closely into other economic activities through public-private partnerships.
- Pay attention to the local social and economic impacts of mineral-extraction industries, focusing on open, informed debates with local stakeholders.
- Keep expectations of local employment and revenue within realistic bounds in order to reduce unnecessary social tensions.
- Introduce accountability mechanisms, including well-resourced inspectorates, to avoid corruption and other governance problems.

## About our study

It is no secret that the strong economic growth of countries such as China has encouraged many countries to step up their production and exports of minerals, spurred on by rising commodity prices. It is also well known that excessive dependence on exports of minerals can lead to countries being afflicted by the so-called 'resource curse'. As documented in a large body of academic and policy relevant literature, symptoms of this problem can range from over-valued exchange rates and crowding out of previously competitive industries to corruption and the macroeconomic challenges of budgeting in the face of volatile fiscal receipts as commodity prices fluctuate.<sup>2</sup>

Not all mineral-dependent countries have become victims of the resource curse, as countries such as Australia, Chile and many states in the Middle East testify. Typically, the winners are high-income countries, while those afflicted by the resource curse are often, but not always, low- and middle-income countries. Unlike their richer counterparts, low- and middle-income countries often lack the institutional arrangements to cope with the challenges of translating mineral wealth into human development.

While excessive mineral dependence among low- and middle-income countries is always a cause for concern, the current global economic uncertainty has made it a much bigger issue. If there is a global economic downturn, commodity prices would fall significantly, leaving many mineral-dependent countries in difficulties. But which countries are most at risk? Our study attempts to answer this question by analysing the evolution of mineral dependence among low- and middle-income countries between 1995 and 2010, and mapping out their relative vulnerability to the resource curse.

Over the past seven years OPM has been the lead contractor for the Resource Endowment initiative and Mining: Partnerships for Development initiative of the International Council on Mining and Metals (ICMM). The lessons that have emerged from this research are that even countries with less-developed economies and institutions are not doomed to suffer the resource curse. They are however, more exposed to such risks, which highlights the need for these countries to understand the issues and manage them effectively. The final chapter of this report discusses the policy options governments should consider – whilst seeking the involvement of industry and other actors – in order to enhance benefits from resource extraction whilst minimising negative resource curse effects.

Below, we explain our methodology. In the following chapters we discuss our findings and conclusions.

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<sup>2</sup> See bibliography at the end of this report.

## How we measured mineral dependence

We define export dependence as the ratio of mineral exports to total merchandise exports. If mineral exports constitute 25% or more of a country's total tangible exports, the country is classified as 'mineral dependent', which is consistent with the IMF's definition of export dependence. Data on trade in minerals and total exports by country were extracted from the UNCTADstat database, focusing on six types of fuels and non-fuel minerals as defined by Standard International Trade Classification (SITC) codes. (See Exhibit 1.)

We considered but rejected alternative ways of defining mineral dependence. These included metrics based on production or tax receipts from extractive industries. Production data are not, on the whole, available in a standardised format and require detailed matching price data for a wide range of minerals. Data on tax receipts by industry sector are similarly not readily available. Such data would in any case distort the current dependence on minerals extraction, due to the typically significant lag between commencement of production (and exports) and payment of taxes.

### Exhibit 1: Six types of minerals were considered

SITC code and description	Terminology used in this report
SITC 27 – Crude fertilizers, other than those of division 56, and crude minerals (excluding coal, petroleum and precious stones)	Minerals (non-fuel)
SITC 28 – Metalliferous ores and metal scrap	
SITC 68 – Non-ferrous metals	
SITC 667 – Pearls and semi-precious stones	
SITC 971 – Gold, non-monetary	
SITC 3 – Mineral fuels (including natural gas), lubricants and related materials	Fuel



## How we assessed countries' vulnerability to the resource curse

We assessed countries' vulnerability to the resource curse along two dimensions: their economic and institutional development, and their mineral dependence.

For a country's economic development, we used GDP per capita as a proxy, using data up to 2009 – the last year for which data are available for all countries in our study. For a country's institutional development, we developed an overall measure of institutional strength of a country by combining the World Bank's six World Governance Indicators (WGI):

- Voice and accountability
- Political stability and absence of violence
- Government effectiveness
- Regulatory quality
- Rule of law
- Control of corruption

We then created two indices, enabling us to develop a two-dimensional matrix that maps out the relative vulnerability of countries to the resource curse:

- *An economic and institutional development index.* Recognising the importance of economic resources as well as institutional frameworks in managing resource wealth, we created an equally weighted index of the country's GDP per capita ranking among all countries, and the country's institutional development ranking among all countries.
- *A mineral dependence index.* To account for some of the challenges faced by countries that are becoming mineral dependent for the first time, we created an index based on the country's mineral dependence ranking in 2010 (weight of 0.75), but accounting for the country's change in mineral dependence since 2005 (weight of 0.25).

The results of our matrix can be found on page 20 of this report.

### Why we chose our three data points: 1996, 2005 and 2010

We calculated export-based mineral dependence for each country using three points in time: 1996, 2005 and 2010. We used a 15-year time frame, starting with 1996, because this allowed us to identify countries that have only recently begun to extract mineral resources, or have recently increased the rate of extraction. Countries that have only recently expanded their minerals exports merit particular attention as their institutions are likely to be inadequately prepared for managing large mineral wealth, rendering these countries more susceptible to resource curse effects. We chose 2005 as a our second data point because this marked the period when commodity prices started to rise strongly, enabling us to assess the impact this had on mineral exports. 2010 is the last full year for which UNCTADstat data are currently available.



95

We identified 95 mineral-dependent countries and analysed their dependency trends over a 15-year period.

# Mineral dependence trends

Our analysis reveals that there has been a strong increase in mineral dependence among low- and middle-income countries since 1996, in terms of both the number of the countries that have become mineral-dependent and their degree of dependence. The biggest increases in dependence have occurred among countries that rely on non-fuel minerals such as copper and gold, particularly since 2005, when commodity prices started to rise sharply. (See Exhibit 2.)

However, for both fuel-dependent and non-fuel, mineral-dependent countries, the trend has not been relentlessly upward for all countries. While some countries have joined the ranks of the mineral-dependent, others have fallen out of the rankings, demonstrating that it is possible for states to reduce their dependence on minerals.

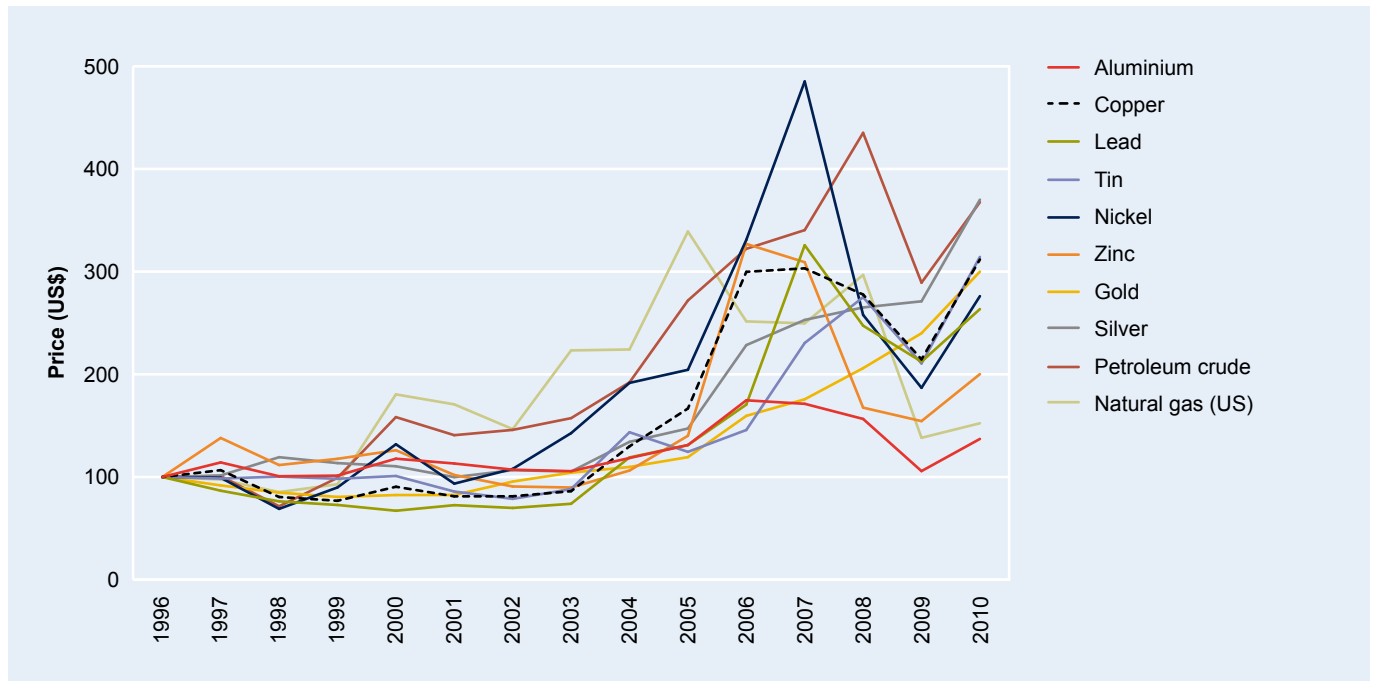
## More low- and middle-income countries become mineral-dependent

Between 1996 and 2010, the number of low- and middle-income countries that depend on exports of minerals increased by 33%, from 46 to 61 countries. Although this increase was split fairly equally between non-fuel, mineral dependent countries and fuel-dependent countries, the trends for these two types of mineral-dependent countries were very different.

- As Exhibit 3 illustrates, the number of non-fuel, mineral-dependent states increased steadily, from 23 in 1996 to 28 in 2005 and 32 in 2010. Moreover, only three countries lost their dependence on minerals and fell out of the rankings over this period: Liberia, Tajikistan and Togo.
- Fuel-dependent countries, on the other hand, followed a much bumpier course, rising from 23 countries in 1996 to 33 in 2005 before falling to 29 fuel-dependent countries in 2010. In addition, six countries fell out of the rankings: Cape Verde, Djibouti, Indonesia, Lithuania, Papua New Guinea and Vietnam.
- The most dramatic changes occurred during the last five years, from 2005 to 2010, when commodity prices started to rise steeply. Over this period, eight countries became dependent on non-fuel minerals: Montenegro, Guyana, Laos, Burkina Faso, Bolivia, Georgia, Somalia and Ghana. In contrast, only one country, became dependent on fuel-based minerals: Belize.
- By 2010, 80% of the 40 non-fuel, mineral-dependent states were low- and middle-income countries, compared to less than 70% of the 45 fuel-dependent countries. (See Exhibit 4.) In other words, non-fuel, mineral-dependent countries are more likely to be low- and middle-income countries compared to their fuel-dependent counterparts. Nearly half of the non-fuel, mineral-dependent countries were in Africa.

## Dependence on non-fuel minerals rises steeply after 2004

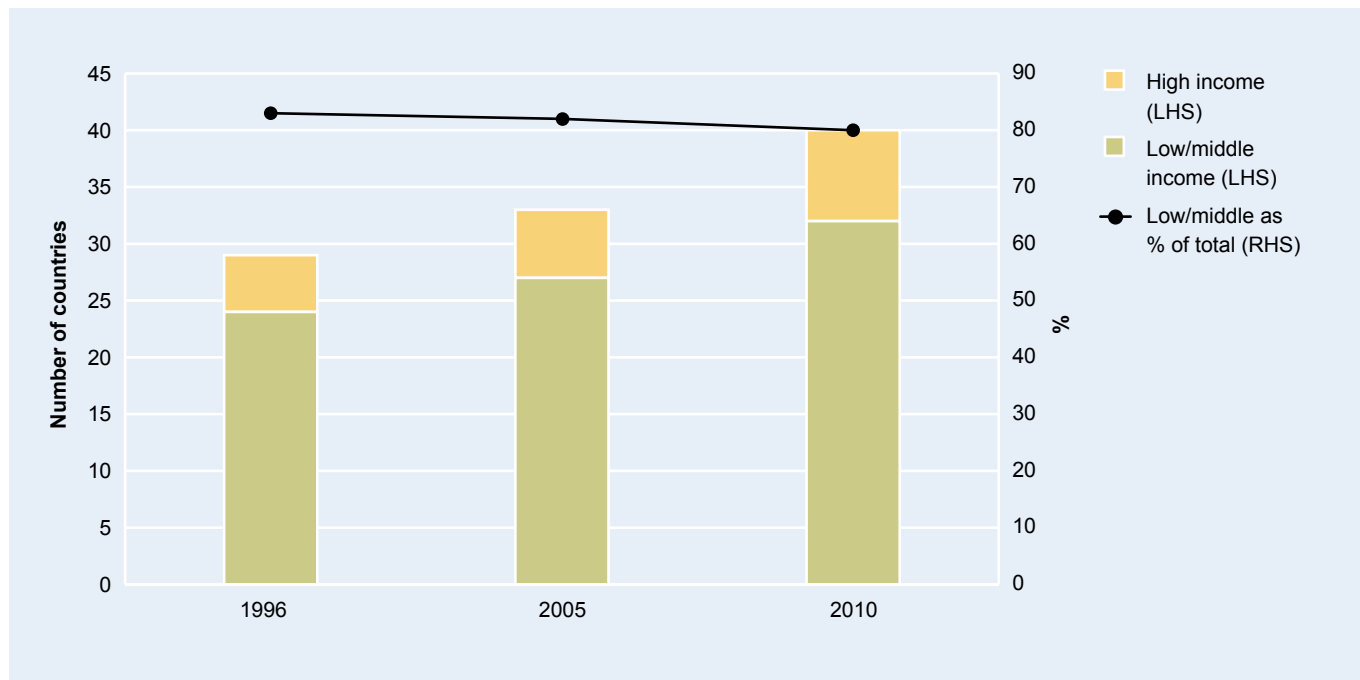
The biggest increases in mineral dependence levels were found among low- and middle-income countries that depend on exports of non-fuel minerals. In fact low- and middle-income countries, as a group, have become increasingly dependent on their exports of these commodities over the last 15 years. Between 1996 and 2005, for example, non-fuel minerals as a percentage of exports for all low- and middle-income countries rose from 12.3% in 1996 to 16.0% by 2010.

**Exhibit 2: Commodity price increases since 1996**

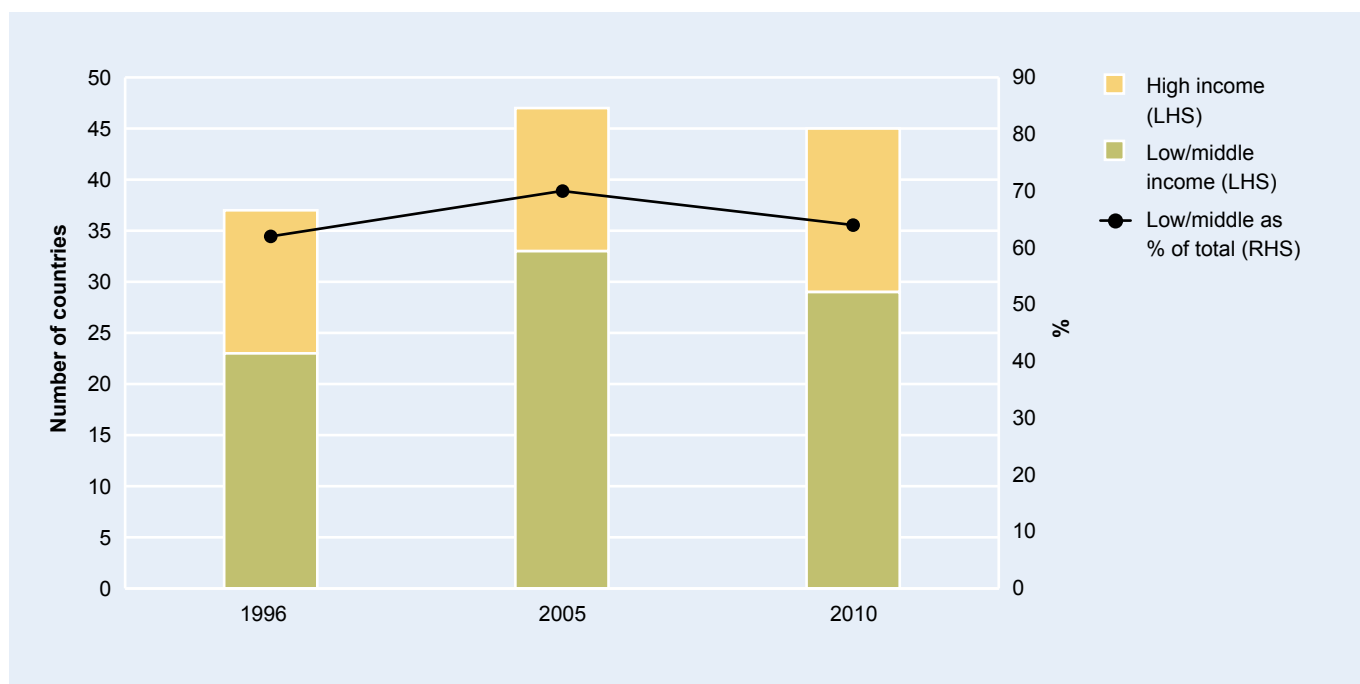
Although the average dependence ratio for countries that depended on non-fuel minerals for more than 25% of their exports remained relatively stable over this period, hovering around 50%, many of these countries increased their dependence levels substantially – and by significantly higher margins than most fuel-dependent countries. As expected, the biggest increases occurred in the last five years, when commodity prices started to increase sharply.

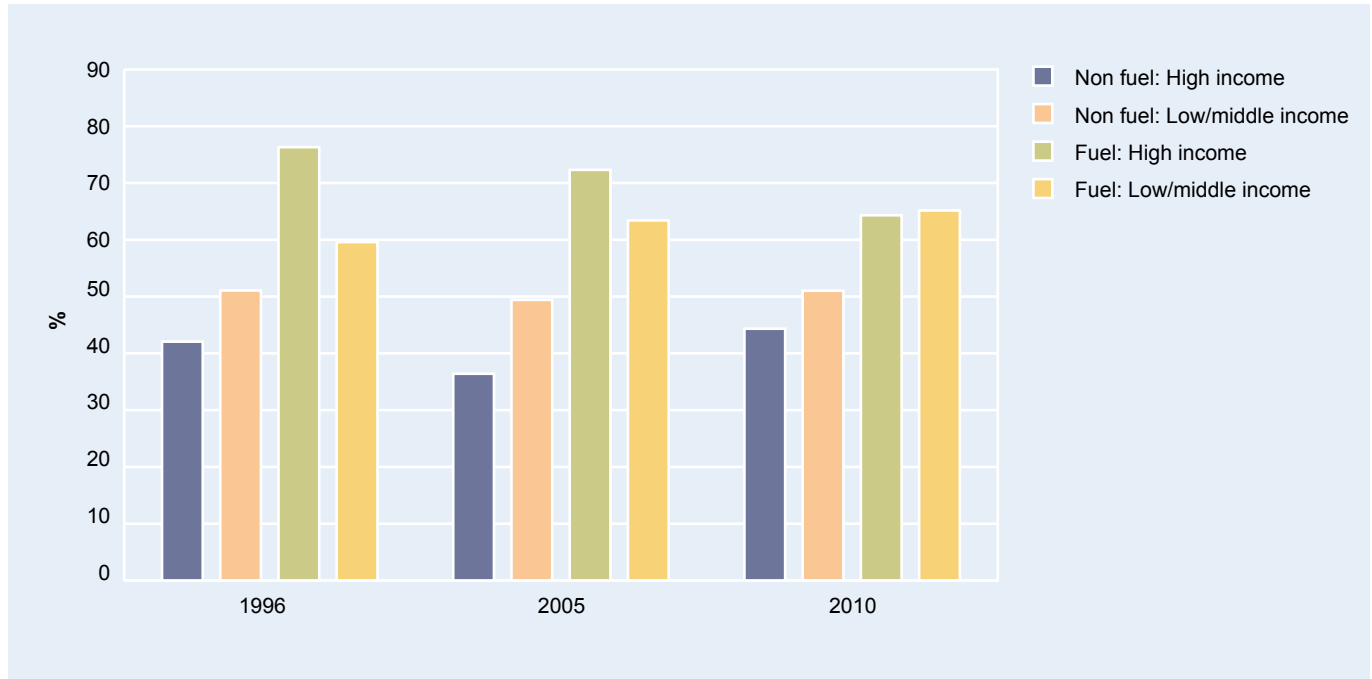
- Between 1996 and 2010, 80% of the non-fuel, mineral-dependent countries increased their dependence levels, compared to 73% of fuel-dependent countries.
- The size of the increase was, however, more significant for countries exporting copper, iron ore, gold and other non-fuel minerals. These countries increased their dependence on minerals by 18% on average, compared to 14% for the fuel-dependent countries, although there were significant variations between countries.
- 14 non-fuel, mineral-dependent states increased their dependence levels by 25 percentage points or more over the last five years. In Burkina Faso, for example, the mining sector accounted for 2% of exports in 2005, in 2010 it was 41%. Over the same period, the mining sector in Laos more than doubled from 17% of exports to 45% of exports.
- Only two fuel-dependent countries, Belize and Gibraltar, experienced more than a 25 percentage point increase in their dependence ratios for the period 2005 to 2010. Across the entire period covered by our study, 1995 to 2010, dependence ratios for fuel-dependent countries changed relatively little with a few notable exceptions, including Chad, Sudan, Timor-Leste and Kazakhstan.

**Exhibit 3a: Changes in the number of non-fuel, mineral-dependent countries over time**



**Exhibit 3b: Changes in the number of fuel-dependent countries over time**



**Exhibit 4: Average dependency ratios by fuel type and income level**

### Fuel-dependent countries still top the table

Despite the greater increases in mineral dependence among non-fuel, mineral-dependent countries, fuel-dependent countries still top the table in terms of overall dependence levels:

- In 2010, the average dependence ratio for fuel-dependent countries was 65%, compared to 50% for non-fuel, mineral-dependent countries. (See Exhibit 4.)
- The 10 most mineral-dependent countries were all fuel-dependent countries, all with dependence ratios in excess of 90%. Angola topped the table (98.6%). In contrast, the dependence ratios for the 10 countries most dependent on mining and metals ranged from 60.4% (Mauritania) to 83.7% (Botswana). (See Exhibit 5.)
- The average dependence ratio for the 20 most fuel-dependent countries was 89%, compared to 63% for the 20 most non-fuel, mineral-dependent countries. (See Exhibit 6.)
- When individual countries' exports of both fuel and non-fuel minerals are combined, fuel-dependent countries still occupy the top-10 places in the mineral-dependence league table and most of the top-20 spots. Only three non-fuel, mineral-dependent countries were in the top 20 for combined mineral exports: the Democratic Republic of Congo (90.5%), Mongolia (87.5%) and Guinea (86.4%). See the Appendix for the full table of combined mineral exports.

But is greater dependence on minerals necessarily associated with lower economic and institutional development? We address this question in the following chapter.

**Exhibit 5: Non-fuel, mineral-dependent countries**

Rank	Country	GDP/capita (PPP at current prices, 2009) US\$	Mineral dependence 1996 %	Mineral dependence 2005 %	Mineral dependence 2010 %	Increase in mineral dependence 1995-2010 pp
1	Botswana	13,384	58.7	86.5	83.7	25
2	Zambia	1,430	79.4	64.0	83.6	4
3	Democratic Republic 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	885	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: UNCTADstat and World Bank.

**Exhibit 6: Fuel-dependent countries**

Rank	Country	GDP/capita (PPP at current prices, 2009) US\$	Mineral dependence 1996 %	Mineral dependence 2005 %	Mineral dependence 2010 %	Increase in mineral dependence 1995-2010 pp
1	Angola	5,812	93.6	96.3	98.6	5
2	Iraq	3,548	84.6	97.1	98.4	14
3	Brunei	–	91.1	92.9	97.4	6
4	Libya	16,502	93.6	95.4	96.1	2
5	Equatorial Guinea	31,779	60.9	94.1	94.6	34
6	Algeria	8,172	77.8	98.4	94.3	16
7	Azerbaijan	9,638	63.5	76.9	91.0	28
8	Chad	1,300	0.0	90.4	90.8	91
9	Nigeria	2,203	93.4	97.2	90.5	-3
10	Qatar	91,379	84.6	84.7	90.2	6
11	Yemen	2,470	96.2	92.1	90.1	-6
12	Kuwait	–	92.6	90.6	89.9	-3
13	Sudan	2,210	0.0	85.5	88.5	88
14	Gibraltar	–	11.4	12.3	85.0	74
15	Saudi Arabia	23,480	83.5	88.3	84.3	1
16	Venezuela	12,323	77.3	83.4	84.2	7
17	Iran	11,558	79.7	85.3	81.8	2
18	Congo	4,238	85.4	87.2	81.3	-4
19	Gabon	14,419	79.5	78.9	78.5	-1
20	Netherlands Antilles	–	78.4	76.9	76.3	-2

Source: UNCTADstat and World Bank.





## Countries at risk of the resource curse

The relatively recent and rapid rise in mineral dependence, particularly among low- and middle-income countries that depend heavily on non-fuel minerals, would suggest that more countries are at risk of the resource curse. But which countries are most vulnerable to these challenges?

To answer this question, we analysed both the economic and institutional development of the countries because both of these dimensions play a critical role in a country's ability to transform mineral resources into sustainable human development. First, we assessed the direction and strength of relationships between mineral dependence and economic and institutional development.<sup>3</sup> We then mapped out the relative vulnerability of mineral-dependent countries to the resource curse, based on weighted indices of their economic and institutional development (see 'About our study', page 5, for our methodology).

Overall, our analysis reveals that more than 20 low- and middle-income countries are particularly vulnerable to the resource curse. In the following chapter we discuss what governments, donors and others can do in these countries to help turn the resource curse into a blessing.

### **Dependence on non-fuel minerals is associated with economic development**

We found a clear negative correlation between non-fuel, mineral dependence and GDP per capita, as shown in Exhibit 7. Although this correlation is not indicative of a causal relationship, it shows that countries with a high dependence on non-fuel minerals are more likely to have lower economic development than other countries, measured by GDP per capita.

Excluding Botswana and Chile – both of which have well-established and long-running mining sectors – the average, annual GDP per capita of the top-20, non-fuel, mineral-dependent countries was \$3,200 in 2009. The countries with the lowest GDP per capita included the Democratic Republic of Congo (GDP per capita: \$319), Sierra Leone (\$808) and Mozambique (\$885).

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Our finding that a higher proportion of states reliant on mining are low- and middle-income countries compared to fuel-dependent states helps explain why industry associations such as the ICMM representing the mining sector are taking a more active role in seeking to address the resource curse agenda compared to representatives of the oil and gas sector, including the International Petroleum Industry Environmental Conservation Association (IPIECA).

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<sup>3</sup> We use Spearman's rank correlations to account for the non-normal distribution of our variables.

**Exhibit 7: Correlations between GDP per capita and mineral dependence**

Year	Mining (Non-fuel minerals)	Fuel
1996	-0.141	-0.033
2005	-0.193	-0.013
2009	-0.169	0.029

Source: UNCTADstat for mineral dep. data, World Bank for GDP data.

**Exhibit 8: Correlations between institutional development and mineral dependence**

Year	Mining (Non-fuel minerals)	Fuel
1996	-0.229	-0.321
2005	-0.209	-0.260
2009	-0.198	-0.285

Source: UNCTADstat for mineral dep. data, World Bank for GDP data.

**High dependence on any mineral is associated with poor governance**

Having looked at correlations between mineral dependence and economic development, we analysed the relationship between mineral dependence and institutional development, using an indicator that aggregates the six World Bank's World Governance Indicators (WGI) to create an overall measure of institutional strength of a country. As mentioned earlier (see 'About the study'), these indicators include voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; and control of corruption.

We found a significant negative correlation between overall institutional development and both non-fuel and fuel dependence. (See Exhibit 8.) This finding is consistent with evidence that there are many fuel-dependent countries with high levels of GDP per capita but with persistent weaknesses of democratic governance and state accountability, such as Equatorial Guinea, Libya and Russia.

Given the above findings that high mineral dependence is associated with lower levels of economic and institutional development, we proceeded to 'map' mineral dependent countries on the basis of their economic and institutional development. The intention is not to prescribe distinct policy prescriptions for different categories of countries, but rather to identify the relative challenges of managing mineral wealth faced by countries at different levels of economic and institutional development.

Based on these two variables we generated two matrices, one for non-fuel, mineral dependent countries and the other for fuel-dependent countries, as seen in Exhibits 9 and 10 respectively:<sup>4</sup>

- Beginning with the right-hand halves of the matrices, these are countries with relatively high levels of economic and institutional development. More government resources and effective bureaucracies make these countries relatively well-equipped to manage resource wealth. Many of these countries, such as Australia and Botswana, also have long-established mining sectors and therefore significant experience in dealing with these issues. However, even for these countries political and economic challenges become more prominent as the levels of mineral dependence increases, particularly for countries in the top right-hand quadrant. Witness the explicit talk about nationalising the mines in South Africa by a would-be contender to Jacob Zuma, and the role of heated windfall tax debates in unseating Kevin Rudd, ex-Prime Minister of Australia.
- Turning to the left-hand sides of the matrices, these are countries with lower levels of economic and institutional development and therefore more limited capacity for managing mineral wealth. They tend to lack the economic resources to invest in infrastructure and capacity building programmes to strengthen links between extractives and the rest of the economy. They also face enormous pressures to spend resource windfalls immediately (pro-cyclically), often to pay for recurring expenditures rather than investing in productive assets. Weak governance ensures that more conservative actors within parliament or the public have limited insight and influence over government's usage of resource revenues. These countries are often heavily dependent on donor aid, compounding the risk of macroeconomic resource-curse effects.
- The countries most at risk from the resource curse are located within the top-left quadrants of each of the matrices. These countries are critically reliant on minerals exports for foreign exchange earnings and therefore most vulnerable to the vagaries of international commodity markets. They are also most severely constrained in terms of economic resources and effective institutions. These countries have limited industrial diversification that would enable either 'upstream' supply industries to develop or 'downstream' value addition. When non-mineral industries are small, the effect of growth in mineral sectors is likely to crowd out other sectors further, as the limited number of skilled individuals move from the non-mineral to the mineral sector (see next chapter).

The countries most at risk of the resource, in the top-left quadrant, include:

- *Non-fuel, mineral-dependent countries:* Bolivia, Burkino Faso, the DRC, Ghana, Guyana, Laos, Mali, Mauritania, Mongolia, Papua New Guinea, Tanzania and Zambia.
- *Fuel-dependent countries:* Algeria, Angola, Azerbaijan, Cameroon, Chad, Cote d'Ivoire, Iran, Iraq, Nigeria, Sudan, Timor-Leste and Yemen.

In the next chapter, we look at measures that can be taken to avoid or reduce the potential negative consequences of over-dependence on minerals.

<sup>4</sup> We exclude countries for which GDP or governance data was not available in 2009. For non-fuel minerals dependent countries, this excludes nine countries (Nauru, Montserrat, French Polynesia, North Mariana Islands, Cuba, Cook Islands, New Caledonia, Bahrain and Somalia). For fuel-dependent countries this excludes seven countries (Kuwait, Gibraltar, Netherlands Antilles, Bahrain, Myanmar, Aruba, Congo and Bermuda).

Exhibit 9: Economic and institutional development of non-fuel, mineral-dependent countries

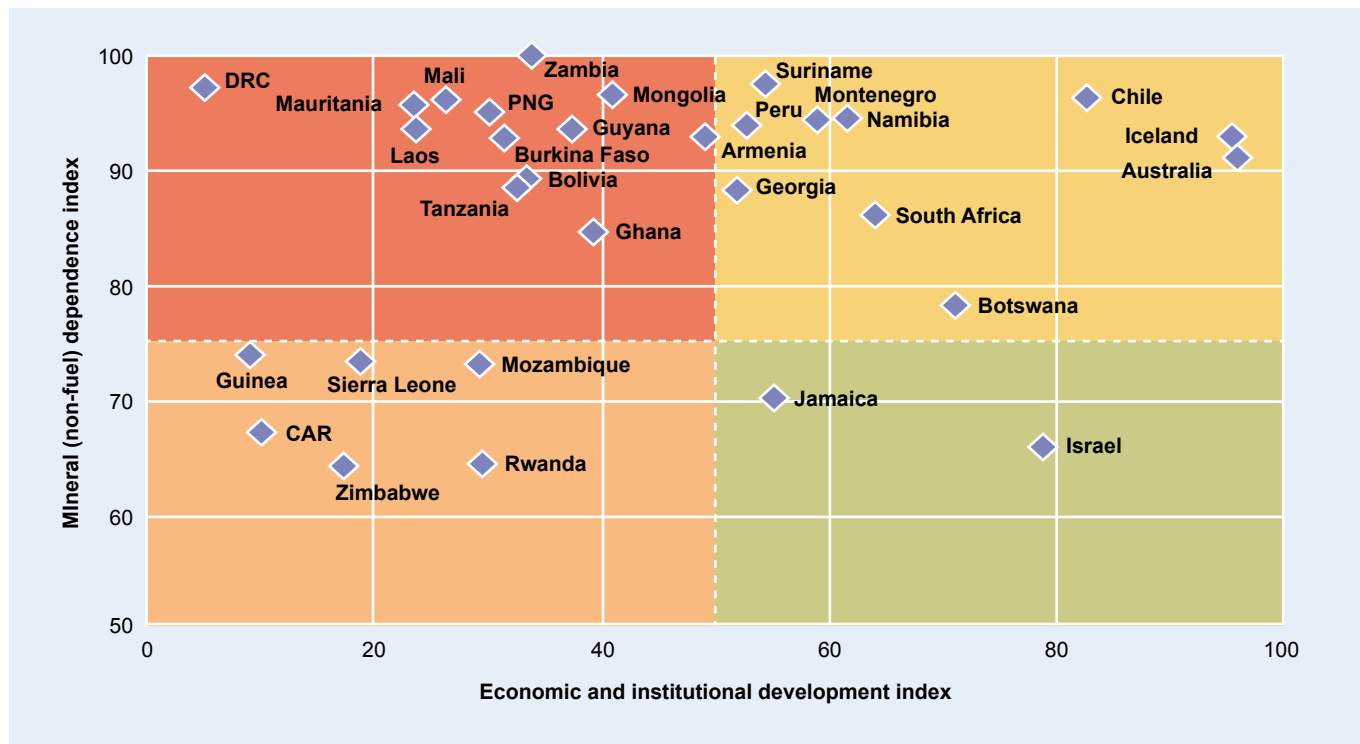
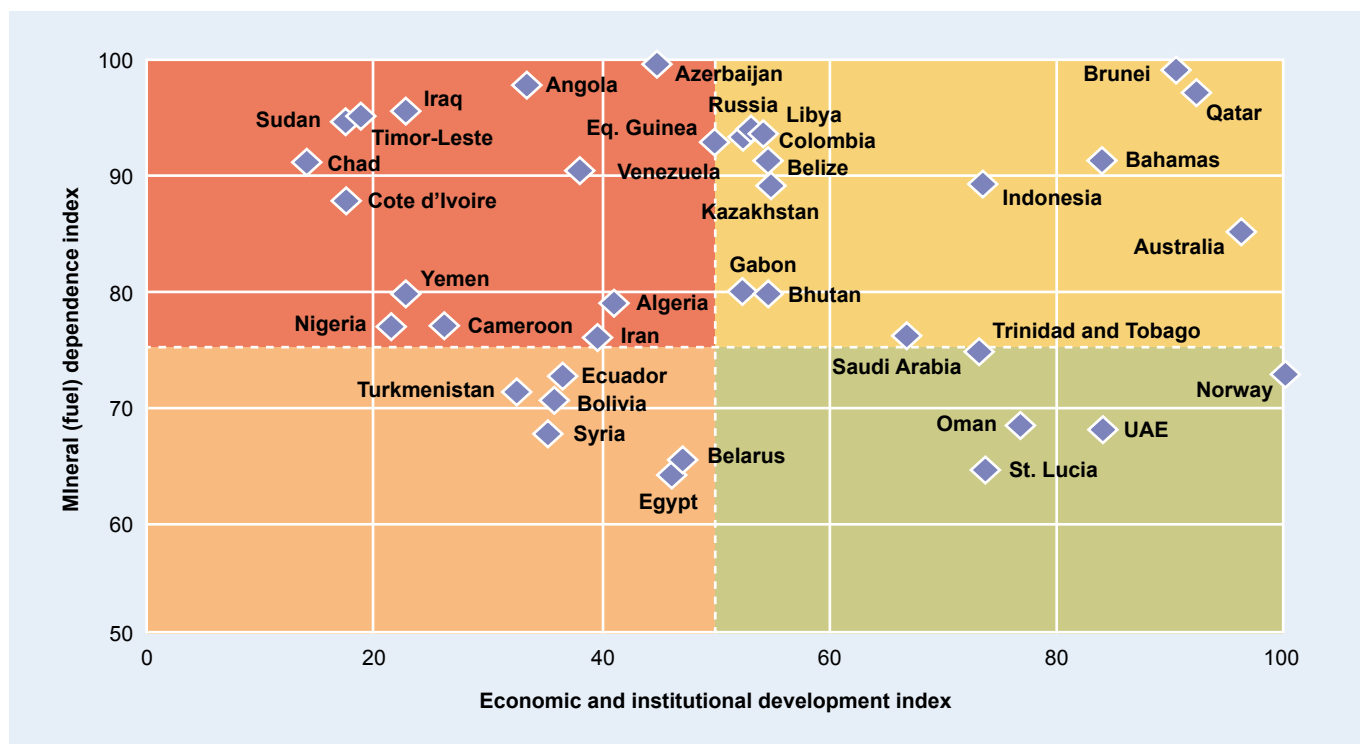


Exhibit 10: Economic and institutional development of fuel-dependent countries



# Policy implications for at-risk countries

Governments, donors, industry and non-government stakeholders all have a strong interest in helping countries avoid the resource-curse trap. Indeed, there is evidence that the recent boom in mineral dependence is taking place within an environment that recognises previous policy mistakes, based on a better understanding of both benefits and costs of minerals extraction. For example, a growing number of countries are seeking validation of their compliance with the Extractive Industries Transparency Initiative (EITI).<sup>5</sup> Elsewhere, the International Finance Corporation has developed Performance Standards for environmental and social safeguards for large-scale extractive industry operators, which have been adopted by project financing banks the Equator Principles which now cover some three-quarters of global project finance.

The private sector has become more aware of the long-term challenges to investment posed by a failure to address the resource curse issues, and is more actively engaged in this agenda (though thus far limited to the mining sector). OPM's work to develop the ICMM Mining: Partnerships for Development toolkit is one such initiative. This framework for understanding and communicating the broader economic and social impacts of mining – at the national and local levels – has now been applied in nine countries.<sup>6</sup> It aims to strengthen the debate and identify opportunities for partnerships to address the economic and institutional capacity gaps faced by so many mineral-dependent countries.

Nonetheless, many countries remain precariously dependent on a handful of mineral commodities, rendering them vulnerable to mismanagement of these resources as well as exogenous shocks, such as falls in international commodity prices. The challenges facing each country will inevitably vary depending on the countries' institutional and economic features, as well as on their distinct local political, economic and historical contexts. However, there are several broad steps that all countries can take to reduce the risk of falling victim to the resource curse:<sup>7</sup>

## 1. Understand and manage the broader macroeconomic impacts

Large inflows of foreign exchange into a small, developing economy can easily have strong negative macroeconomic impacts. Appreciation of the local currency is one of the most detrimental of these, and results from the exchange of large, often dollar-denominated, receipts into illiquid local currencies. Even where exchange rates are fixed, the adverse economic impacts remain: the increased spending puts upward pressure on the so-called real exchange rate (RER) by driving price inflation and higher costs for local producers. These higher costs undermine the competitiveness of exporting sectors that employ many more people than mining, such as manufacturing and agriculture.

A sharp spike in demand for skilled or semi-skilled people also risks 'crowding out' nascent manufacturing sectors in developing countries, as people move away from manufacturing to the higher-paying mineral sector. Importantly, many least developed countries are also highly aid-dependent, and some of those with mineral resources are now receiving significant foreign exchange flows both from minerals and from aid, exacerbating the risk of RER appreciation.

The challenge for governments and other stakeholders in mining is to understand the broader economic impacts. An economic life cycle approach can help manage expectations and alert policy makers to the large future inflows they will need to manage.<sup>8</sup> Companies, in turn, can help by proactively engaging with public finance institutions to share production and revenue forecasts.

<sup>5</sup> See [www.eiti.org](http://www.eiti.org)

<sup>6</sup> The latest completed country case study was Laos, see bibliography for full reference.

<sup>7</sup> For a more detailed overview of these issues and how countries have sought to address them, please see OPM's literature review undertaken in developing the ICMM's REI analytical framework (see bibliography).

<sup>8</sup> In 2009 OPM developed an innovative life-cycle approach to understanding the economic impacts of mining, applied to the Tanzanian gold mining sector (see bibliography). This framework has since been integrated into the ICMM Mining: Partnerships for Development toolkit.

## 2. Use mineral receipts to invest in productive assets.

Managing large resource wealth places a range of demands on government functions, including ministries, the treasury, revenue authorities and the central bank. Even when a country complies with the EITI, and information about what companies actually *are* paying becomes public, there is often limited capacity among revenue authorities to discern what companies *should* be paying. This makes it easy for companies to engage in transfer pricing – notably, overstating costs or understating revenues – in order to reduce taxable income. The lack of effective public finance management systems in many poorer countries, coupled with enormous popular demands for increased government spending, can easily result in profligacy and pro-cyclical spending.<sup>9</sup>

To secure the broad benefits of mineral wealth, governments should use the returns from their extractive industries to invest in productive assets such as infrastructure, rather than recurrent government expenses such as salaries or ‘white elephants’. ‘Future funds’ that aim to smooth spending over time should also be considered, but careful attention needs to be paid to political economy issues, such as the role of interest groups calling for increased current spending.<sup>10</sup>

## 3. Integrate mining more closely with other economic activities

Economic diversification is an important objective for many mineral dependent countries. Although modern mining is capital intensive and therefore uses relatively little direct employment, it uses large quantities of consumable inputs ranging from petrochemicals and compressors to valve heads and engineering works. If this demand can be met by locally owned and operated companies, the total *induced* employment benefits from mining may be several times larger than benefits from direct employment.

To unlock these social and economic benefits, policy makers need to integrate mineral industries more closely with existing economic activities. As the ICMM’s seven-year REi programme highlighted, the most effective way for governments to achieve this objective is by building partnership with the key stakeholders, including the extractive industry companies, local suppliers, donors and NGOs. For example, several companies such as Vale – the second largest mining company by market capitalisation – are creating their own integrated value chains, including railroads and ports, that could be used to accelerate government’s development plans. Similarly, donors and companies could work with governments to identify and address obstacles faced by local suppliers, for example by providing funding and technical assistance or vocational education initiatives.

The ICMM Mining: *Partnerships for Development* toolkit, published in June 2011, includes a detailed guide for identifying and building partnerships between stakeholders (see bibliography). OPM has so far applied this approach in six countries, mapping economic and social partnership across six areas: regional development, local content, revenue management, poverty reduction, social investment and dispute resolution.

9 See Velasco (2011) and ICMM (2008) in the bibliography.

10 As illustrated by the Chad-Cameroon pipeline. See Pegg (2009) in the bibliography.

#### 4. Understand and communicate the local economic and social impacts

Mining (less so oil and gas) generates much-needed jobs, and provides incomes for people supplying goods and services to these companies. It may also be associated with serious negative impacts at the local level that can easily spiral out of control, including inflation and immigration. Inflation arises because demand generated by mining for inputs often outstrips supply, which fails to respond within small and underdeveloped local markets. Around small communities and networks of towns, with oft-neglected infrastructure connecting them, supply responses are slow. This results in price inflation that is highly localised and economically disruptive. It reduces real incomes across-the-board, hitting the poorest and most vulnerable the hardest. At the same time, communities suffer from high immigration as people are lured by the prospect a job in the mine, leading to pressures on local public services that cash-strapped local governments struggle to cope with.

The main challenges here are associated with location and timing. First, the negative impacts are focused at the local level, in the form of displacement, pollution, immigration etc. Second, these impacts often take place before the production has actually begun, and thus before any taxes or royalties have been paid by the company. Some argue that pre-payment of royalties is one solution, but others highlight the risks of deterring investors from investing in countries with already-volatile policy environments and low administration capacity.

Initiatives such as the Natural Resource Charter seek to promote auctions of mineral reserves as a way to capture some rents at an early stage of the mineral value chain. However, there is no guarantee that the proceeds from these auctions will reach local governments.<sup>11</sup> Even if funds do reach them, local governments and communities often lack the capacity to effectively implement social projects. Donors and companies could help build the necessary capacity, recognising that a stronger local government is in everybody's interest – without it companies risk being seen as 'de facto' governments in the eyes of local communities.

#### 5. Reduce potential social tensions by managing expectations

The fundamental mismatch between local expectations and what a mine can actually deliver in terms of benefits is a driver of much of the social tensions witnessed around resource projects. Local conflicts can easily escalate to national-level political battles, threatening the continued commitment from investors. Companies and governments both have an interest in managing such expectations by establishing and sustaining dialogue with communities as well as local and central government. This will help the firm to communicate openly and honestly the forecast for number of jobs to be created, the skills required, and the taxes paid. All participants have to be realistic and recognise, for instance, that net benefits for the community will be more limited if (as in northern Tanzania) large-scale mining comes to displace the livelihoods of large numbers of artisanal miners.

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<sup>11</sup> An additional issue with respect to auctioning is that many minerals e.g. gold and copper are not suited to auctions. This is because significant costs have to be incurred by an exploration company before deposits can be assured, and companies unlikely to find the investment worthwhile unless they are given rights to the minerals they find.



## 6. Introduce accountability mechanisms

Accountability in institutional and governance frameworks are needed at each stage of the extractives value chain, from awarding the licences and monitoring environmental impacts through to revenue collection, spending and closure. Policies are ineffective unless accompanied by careful attention to implementation, including well-resourced and well-incentivised inspectorates. The large and 'bumpy' nature of fiscal receipts from extractive industries make them more likely to be affected by government corruption and their unexpected nature makes them more easily distributed through patronage networks. The EITI is helping to address this issue – often successfully – but remains a one-issue initiative.

The NRC is leading an agenda to increase accountability across the extractives value chain more broadly, and one possibility being discussed is to base it on the multi-stakeholder model of the EITI (where 5 government representatives, 5 from civil society and 5 from the companies meet regularly to check progress in EITI implementation). This is a promising pathway, but one that is fraught with dangers (co-opted civil society, lacking understanding of highly technical issues, and questions about enforcement.)<sup>12</sup> The recently announced new Guinea Mining Code is one to watch: the code aims to apply the EITI's approach to multi-stakeholder oversight to the full spectrum of mining policies, through the establishment of a 'Commission National des Mines' comprising government NGOs and unions.

## Concluding remarks

So what is the way forward? Current global economic uncertainties aside, the long-term growth of large emerging markets is likely to keep prices for oil, gas and other minerals relatively high. This represents a major opportunity for less-developed countries, yet the challenges of managing minerals remain large. For many countries these challenges may be even bigger than in the past, as governments in poor mineral-dependent countries reduce their dependence on donor aid, and with it the oversight and checks on accountability that come with such programmes.

At the heart of the issue is the fact that the economic and social impacts of mineral extraction are complex, multi-faceted, and easily politicised. Debates about extractive industries are often highly polarised and tend to focus on an overly narrow set of issues, usually taxation and sometimes just on royalties. Building consensus around the broader set of impacts and priority mitigation measures is a necessary first step towards identifying the roles and responsibilities of governments, industry and donors. The ICMM MPD toolkit provides one such framework for bringing together diverse stakeholders to debate these impacts, with the aim of promoting more nuanced – and ultimately more pro-development – policy and mining practices. The key point is that in this process many actors have a role to play: neither governments nor companies can 'go it alone'. Only by working together can they ensure that mineral dependence is more likely to be a blessing than a curse.

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<sup>12</sup> It is often claimed that the EITI has been so successful largely because of its simplicity.

# Appendix

## All non-fuel, mineral-dependent countries

Rank	Country	GDP/capita (PPP at current prices, 2009) US\$	Mineral dependence 1996 %	Mineral dependence 2005 %	Mineral dependence 2010 %	Increase in mineral dependence 1995-2010 pp
1	Botswana	13,384	58.7	86.5	83.7	25
2	Zambia	1,430	79.4	64.0	83.6	4
3	Democratic Republic 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	885	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
21	Montenegro	13,086	0.0	0.0	46.8	47
22	Guyana	3,240	37.4	29.7	46.6	9
23	Laos	2,255	1.2	16.8	44.6	43
24	Iceland	36,795	10.6	19.0	42.0	31
25	Tanzania	1,362	3.9	36.4	40.7	37

Source: UNCTADstat and World Bank.

Rank	Country	GDP/capita (PPP at current prices, 2009) US\$	Mineral dependence 1996 %	Mineral dependence 2005 %	Mineral dependence 2010 %	Increase in mineral dependence 1995-2010 pp
26	Burkina Faso	1,187	7.6	2.0	40.7	33
27	Australia	39,539	24.5	27.4	40.3	16
28	Cook Islands	–	26.8	22.3	39.1	12
29	New Caledonia	–	42.2	28.8	37.9	-4
30	South Africa	10,278	20.8	33.9	37.4	17
31	Central African Republic	757	59.4	44.8	35.8	-24
32	Bahrain	–	40.1	32.0	35.8	-4
33	Bolivia	4,419	32.3	19.3	34.6	2
34	Montserrat	–	0.2	6.4	34.1	34
35	Georgia	4,774	8.0	21.1	33.7	26
36	Israel	27,656	31.9	38.6	33.5	2
37	Somalia	–	0.0	5.4	33.4	33
38	Rwanda	1,136	3.4	39.8	27.4	24
39	Zimbabwe	–	14.5	37.0	26.8	12
40	Ghana	1,552	33.1	18.4	25.4	-8

Source: UNCTADstat and World Bank.

## All fuel-dependent countries

Rank	Country	GDP/capita (PPP at current prices, 2009) US\$	Mineral dependence 1996 %	Mineral dependence 2005 %	Mineral dependence 2010 %	Increase in mineral dependence 1995-2010 pp
1	Angola	5,812	93.6	96.3	98.6	5
2	Iraq	3,548	84.6	97.1	98.4	14
3	Brunei	–	91.1	92.9	97.4	6
4	Libya	16,502	93.6	95.4	96.1	2
5	Equatorial Guinea	31,779	60.9	94.1	94.6	34
6	Algeria	8,172	77.8	98.4	94.3	16
7	Azerbaijan	9,638	63.5	76.9	91.0	28
8	Chad	1,300	0.0	90.4	90.8	91
9	Nigeria	2,203	93.4	97.2	90.5	-3
10	Qatar	91,379	84.6	84.7	90.2	6
11	Yemen	2,470	96.2	92.1	90.1	-6
12	Kuwait	–	92.6	90.6	89.9	-3
13	Sudan	2,210	0.0	85.5	88.5	88
14	Gibraltar	–	11.4	12.3	85.0	74
15	Saudi Arabia	23,480	83.5	88.3	84.3	1
16	Venezuela	12,323	77.3	83.4	84.2	7
17	Iran	11,558	79.7	85.3	81.8	2
18	Congo	4,238	85.4	87.2	81.3	-4
19	Gabon	14,419	79.5	78.9	78.5	-1
20	Netherlands Antilles	–	78.4	76.9	76.3	-2
21	Timor-Leste	805	0.0	60.1	74.6	75
22	Turkmenistan	7,242	74.7	89.1	74.1	-1
23	Kazakhstan	11,510	32.9	70.1	71.7	39
24	Russian Federation	18,932	43.1	61.8	69.1	26
25	Trinidad and Tobago	25,572	50.3	70.2	68.0	18
26	Norway	56,214	54.7	67.7	64.1	9
27	Colombia	8,959	35.9	39.2	56.7	21

Source: UNCTADstat and World Bank.

Rank	Country	GDP/capita (PPP at current prices, 2009) US\$	Mineral dependence 1996 %	Mineral dependence 2005 %	Mineral dependence 2010 %	Increase in mineral dependence 1995-2010 pp
28	Ecuador	8,268	36.3	59.5	56.2	20
29	Oman	–	79.2	84.9	55.0	-24
30	Cameroon	2,205	36.3	49.4	49.2	13
31	Bolivia	4,419	13.1	47.8	43.3	30
32	United Arab Emirates	57,744	75.8	62.0	42.8	-33
33	Bahamas	–	0.0	23.5	38.6	39
34	Syria	4,730	69.6	46.9	35.5	-34
35	Belize	6,628	1.9	0.4	34.5	33
36	Bahrain	–	27.0	43.9	32.9	6
37	Myanmar	–	0.2	33.1	32.7	32
38	Côte d'Ivoire	1,701	15.4	27.7	32.6	17
39	Aruba	–	94.5	92.9	32.4	-62
40	Bhutan	5,113	31.0	30.9	31.1	0
41	Indonesia	4,199	0.0	27.7	29.6	30
42	Saint Lucia	9,605	0.0	52.9	29.0	29
43	Australia	39,539	16.9	25.6	28.9	12
44	Egypt	5,673	47.6	51.3	28.7	-19
45	Belarus	13,040	7.8	34.8	28.1	20

Source: UNCTADstat and World Bank.

## Countries' combined fuel and non-fuel, mineral dependence

Rank	Country	GDP/capita (PPP at current prices, 2009) US\$	Mineral dependence 1996 %	Mineral dependence 2005 %	Mineral dependence 2010 %	Increase in mineral dependence 1995-2010 pp
1	Angola	5,812	98.8	99.5	99.7	1
2	Iraq	3,548	84.9	97.3	99.1	14
3	Algeria	8,172	78.4	98.9	98.4	20
4	Brunei	–	91.2	92.9	97.5	6
5	Libya	16,502	93.6	95.9	97.0	3
6	Equatorial Guinea	31,779	60.9	94.1	95.5	35
7	Sudan	2,210	4.0	88.5	94.2	90
8	Nigeria	2,203	93.6	97.4	91.7	-2
9	Azerbaijan	9,638	65.2	80.6	91.3	26
10	Chad	1,300	0.1	90.5	90.9	91
11	Kuwait	–	93.3	91.5	90.9	-2
12	Qatar	91,379	84.9	85.0	90.8	6
13	Yemen	2,470	96.5	92.8	90.8	-6
14	Democratic Republic of the Congo	319	83.1	86.6	90.5	7
15	Congo	4,238	87.8	92.8	90.3	3
16	Venezuela	12,323	83.0	87.7	87.9	5
17	Mongolia	3,522	60.3	74.1	87.5	27
18	Gibraltar	–	29.7	17.7	86.6	57
19	Guinea	1,048	81.6	89.3	86.4	5
20	Iran	11,558	81.2	87.4	85.5	4
21	Gabon	14,419	83.4	84.4	85.3	2
22	Saudi Arabia	23,480	84.3	88.8	85.2	1
23	Kazakhstan	11,510	52.7	84.9	84.8	32
24	Zambia	1,430	83.1	64.7	84.2	1
25	Botswana	13,384	58.8	86.6	84.0	25

Source: UNCTADstat and World Bank.

Rank	Country	GDP/capita (PPP at current prices, 2009) US\$	Mineral dependence 1996 %	Mineral dependence 2005 %	Mineral dependence 2010 %	Increase in mineral dependence 1995-2010 pp
26	Netherlands Antilles	–	83.1	77.9	80.2	-3
27	Suriname	–	72.3	66.9	79.1	7
28	Bolivia	4,419	45.4	67.1	77.9	32
29	Russian Federation	18,932	53.0	69.0	75.6	23
30	Turkmenistan	7,242	75.6	89.4	75.3	0
31	Timor-Leste	805	0.0	60.6	74.7	75
32	Mauritania	1,929	36.3	49.3	72.2	36
33	Peru	8,629	54.9	67.2	72.2	17
34	Mozambique	885	7.4	81.7	72.0	65
35	Papua New Guinea	2,281	55.1	66.0	71.6	16
36	Trinidad and Tobago	25,572	50.7	70.6	70.8	20
37	Norway	56,214	61.7	73.7	70.5	9
38	Australia	39,539	41.5	53.0	69.2	28
39	Bahrain	–	67.1	75.8	68.6	2
40	Oman	–	80.6	86.0	67.8	-13
41	French Polynesia	–	69.2	55.3	67.2	-2
42	Chile	14,311	47.9	58.5	66.7	19
43	United Arab Emirates	57,744	79.8	72.2	64.6	-15
44	Colombia	8,959	40.1	43.9	63.8	24
45	Jamaica	7,633	50.2	75.9	63.5	13
46	Laos	2,255	1.6	27.8	62.0	60
47	Nauru	–	73.1	25.7	60.9	-12
48	Northern Mariana Islands	–	3.6	4.5	58.9	55
49	Ecuador	8,268	39.1	60.1	57.7	19
50	Montenegro	13,086	0.0	0.0	56.9	57

Source: UNCTADstat and World Bank.

Rank	Country	GDP/capita (PPP at current prices, 2009) US\$	Mineral dependence 1996 %	Mineral dependence 2005 %	Mineral dependence 2010 %	Increase in mineral dependence 1995-2010 pp
51	Mali	1,186	9.6	37.8	55.4	46
52	Sierra Leone	808	31.1	58.9	55.0	24
53	Namibia	6,410	37.4	41.6	53.9	16
54	Armenia	5,279	26.0	42.2	53.5	28
55	Cameroon	2,205	42.1	54.2	52.8	11
56	Cuba	–	16.5	41.3	50.7	34
57	South Africa	10,278	29.1	43.8	47.5	18
58	Guyana	3,240	37.4	29.7	46.6	9
59	Bhutan	5,113	34.3	39.3	44.8	11
60	Iceland	36,795	10.7	20.4	43.1	32
61	Tanzania	1,362	4.3	40.4	43.0	39
62	Bahamas	–	15.4	26.6	41.9	26
63	Burkina Faso	1,187	23.0	2.1	40.7	18
64	Indonesia	4,199	0.0	36.4	40.2	40
65	Syria	4,730	70.5	49.2	39.9	-31
66	Cook Islands	–	27.0	22.3	39.1	12
67	Egypt	5,673	53.5	54.2	38.6	-15
68	Myanmar	–	8.1	37.3	38.1	30
69	New Caledonia	–	42.2	29.9	38.0	-4
70	Central African Republic	757	59.6	46.2	36.6	-23
71	Georgia	4,774	26.9	24.3	35.7	9
72	Aruba	–	94.8	93.8	35.6	-59
73	Canada	37,808	17.9	27.2	35.6	18
74	Belize	6,628	2.1	0.4	34.5	32
75	Somalia	–	0.0	6.0	34.2	34

Source: UNCTADstat and World Bank.



Rank	Country	GDP/capita (PPP at current prices, 2009) US\$	Mineral dependence 1996 %	Mineral dependence 2005 %	Mineral dependence 2010 %	Increase in mineral dependence 1995-2010 pp
76	Montserrat	–	0.2	20.1	34.1	34
77	Israel	27,656	32.4	38.7	33.7	1
78	Côte d'Ivoire	1,701	16.1	28.2	33.4	17
79	Senegal	1,817	29.1	22.6	32.4	3
80	India	3,296	17.7	30.3	32.0	14
81	Kyrgyzstan	2,283	20.9	44.2	31.4	10
82	Saint Lucia	9,605	0.3	53.6	31.3	31
83	Zimbabwe	–	16.4	37.8	31.1	15
84	Niger	690	39.1	32.5	30.5	-9
85	Uzbekistan	2,875	15.5	32.1	30.4	15
86	Bulgaria	13,870	16.8	25.0	30.1	13
87	Liberia	396	50.3	3.6	29.5	-21
88	Albania	3,817	14.5	13.8	29.0	15
89	Benin	1,508	5.4	23.2	28.9	23
90	Belarus	13,040	8.8	35.3	28.8	20
91	Brazil	10,367	12.4	16.5	28.8	16
92	Rwanda	1,136	3.4	41.4	28.4	25
93	Ghana	1,552	36.4	26.0	28.1	-8
94	Togo	850	38.8	23.2	28.1	-11
95	Bosnia and Herzegovina	8,578	9.6	31.8	26.8	17

Source: UNCTADstat and World Bank.

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# About the Author

## Dan Haglund

Dan Haglund is an economist focused on the extractive industries. Dan is Acting Manager of OPM's Extractive Industries Portfolio, covering the various work streams on mining, oil and gas. This includes providing applied policy advice, impact assessments and political economy analyses for donors and governments (funded mainly by the World Bank and DFID) as well as the private sector (through ICMM as well as private clients).

Dan's PhD thesis at the University of Bath explored the dynamics of fiscal and regulatory policy-making in the Zambian mining sector. This led to a series of articles in peer-reviewed journals as well as other publications, focusing on mining sector policy and broader China-Africa relations.

Prior to his doctorate, Dan spent four years working in investment banking in London, with responsibilities that included complex financial modelling of infrastructure projects. He is fluent in English, Spanish and Swedish, his native language, and speaks intermediate Mandarin.

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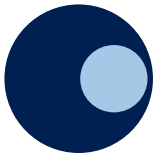
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