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Dependence on extractive industries in lower-income countries

The statistical tendencies

Alan Roe¹ and Samantha Dodd²

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Abstract: This paper synthesizes statistical information evidencing the proposition that extractive industries are of great significance in many low- and middle-income developing economies. It examines the scale of the current dependence of low- and middle-income economies on both types of extractive resources: metals, and oil and gas. The paper also assesses how country levels of dependence have changed in the past twenty years, showing that there has been a clear upward trend. The paper outlines how the upward trend has continued in many countries despite the recent commodity price collapse, and assesses some of the consequences of that collapse.

Keywords: development, oil, gas, exports, dependence

JEL classification: B2, O1, Q3, Q4

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¹ UNU-WIDER, Warwick University, and Oxford Policy Management, London, UK, corresponding author: alan.roe14@gmail.com; ² Behavioural Insights Team, London, UK.

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Information and requests: publications@wider.unu.edu

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Katajanokanlaituri 6 B, 00160 Helsinki, Finland

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1 Introduction

The central proposition of this paper is that extractive industries—minerals (metals and other minerals) plus oil and gas¹—today play a highly significant role in the economic situations of many low- and middle-income developing economies. This being the case, it is important to understand better the various dimensions of that role; to design approaches and policies that can enhance the positive contributions of extractives; to improve the approaches that can mitigate the potential negative impacts; and generally to embrace the extractives sector as a key contributor to long-run economic and social development. In adopting such an approach, this paper does not seek to deny the multiple arguments that together constitute the so-called ‘resource curse’ paradigm. Nor does it take an excessively rose-tinted view of the potential developmental benefits of extractives. Rather, it asserts the core fact that extractives are important and therefore need to be embraced more fully (than is commonly the case) in debates about broader economic and social development.

The purpose of this paper is to synthesize some statistical and other relevant facts to evidence the central proposition that extractive industries are indeed of great significance in many low- and middle-income developing economies. There are four sub-components of this central proposition that are addressed in the subsequent sections of the paper, namely:

- Section 2: How great today is the statistical dependence on extractive industries in low- and middle-income developing countries?
- Section 3: Has that level of statistical dependence changed over time—in fact, over the past two decades, since 1996?
- Section 4: Has the level of dependence changed as a result of the sharp drop in the prices of extracted commodities in the past 3–4 years, i.e. since the end of the so-called ‘super cycle’?
- Section 5: What can we say about the likely future implications of extractives dependence given both the current softness of prices and some obvious global structural changes such as the phasing-down of global dependence on fossil fuels?²

2 Current levels of dependence of extractives

2.1 Minerals

The ICMM publication *The Role of Mining in National Economies* (ICMM 2014) provides data on various measurable aspects of the contribution of mining (but not oil and gas) for every economy in the world (214 countries in total) for the year 2012.³ By combining the data for three key

¹ It is readily accepted that some of the analysis of the book might also be applied to other natural resource industries such as forestry.

² The answers to these questions that we are able to provide at this stage rely a great deal on work that has previously been done by ourselves and others under the auspices of the International Council of Mining and Metals (ICMM)—see ICMM (2012, 2014). For this present paper we have produced only partial updates to that published work.

³ Since this paper was written, ICMM has published the third edition of this publication (ICMM 2016), which updates the statistical results on the MCI to the year 2014. These results would marginally alter some of the findings in Section

indicators, that publication provided an updated version of what it terms the Mining Contribution Index (MCI).⁴ The ranking of the MCI results for all 214 countries shows that among the top 50 countries, no fewer than 31 are either low-income (14 countries) or lower-middle-income (17 countries), as classified by the World Bank.⁵ There are also 4 higher-middle-income countries (Botswana, Suriname, Mongolia, and Namibia) among the 50 countries recording the highest levels of overall mineral dependence. So, even if we were to focus only on minerals and ignore oil and gas, there are some 35 relatively low-income countries where extractive activity is of very great significance.

The decomposition of the MCI data into two of its three component parts (exports and production) reveals a further important point: that *the most important countries in terms of production* (both US\$ value and shares of total world production) *are almost all high-income countries* (notably Australia, Chile, Russia, the USA, and Canada) or higher-middle-income countries (notably Brazil, China, and South Africa). Although a few lower-income countries, such as Mauritania, Guyana, Guinea, and Zimbabwe, have production levels that are high relative to their levels of GDP, their *absolute* levels of production are small relative to those of the richer economies. By contrast, the list of the *most significant countries in terms of export contribution* (mineral exports as a percentage of total exports) *is dominated by low- or lower-middle-income countries*. For example, in 2012, Botswana, Zambia, Eritrea, and Guinea had particularly high mineral export shares of 91.6 per cent, 69.2 per cent, 60.5 per cent, and 60.1 per cent, respectively. Only 3 of the top 20 countries on this indicator were classified as high-income.⁶ Table 1 lists all 37 countries that had a mineral export share greater than 30 per cent. All but 5 of these countries (shaded rows)—so 32 countries in total—were in the low- or middle-income categories.

2 of this paper (which are based on the MCI data for 2012) but do not change the basic propositions presented there, or the analysis of the later sections, which, consistently with the later ICMM publication, uses export data up to 2014.

⁴ The three indicators were (i) exports of minerals including coal as a share of total merchandise exports in 2012; (ii) the percentage point change in that same indicator measured between 2007 and 2012; and (iii) the total production of metallic minerals including coal expressed as a percentage of GDP. The revised version published in 2016 now uses four indicators rather than three.

⁵ We here use the Bank's most recent classification, which differs slightly from the one that would have applied in 2012—the year to which the MCI data relate.

⁶ ICMM (2014: table 2).

Table 1: Mineral export dependence in 2012

	Country	Classification	Minerals incl. coal as % of total
1	Nauru	Small Island State	95.9
2	Botswana	Upper-middle	91.7
3	Mongolia	Upper-middle	83.1
4	Dem. Rep. of the Congo	Low	81.5
5	Suriname	Upper-middle	75.7
6	Zambia	Lower-middle	69.2
7	French Polynesia	High	64.6
8	Mauritania	Lower-middle	62.9
9	Chile	High	61.6
10	Eritrea	Low	60.5
11	Peru	Upper-middle	60.1
12	Guinea	Low	60.1
13	Guyana	Lower-middle	58.8
14	Tajikistan	Lower-middle	58.5
15	Australia	High	57.3
16	Korea, Dem. People's Rep. of	Low	54.4
17	Namibia	Upper-middle	53.4
18	Papua New Guinea	Lower-middle	51.3
19	Sierra Leone	Low	50.6
20	Mozambique	Low	47.5
21	Burkina Faso	Low	46.3
22	Sudan	Low	45.8
23	Montserrat	?	45.7
24	Montenegro	Upper-middle	44.7
25	Armenia	Lower-middle	44.5
26	Lesotho	Lower-middle	44.5
27	Central African Republic	Low	44.4
28	Mali	Low	42.3
29	Lao People's Dem. Rep.	Lower-middle	39.6
30	Rwanda	Low	39.1
31	Jamaica	Upper-middle	39.1
32	South Africa	Upper-middle	38.8
33	New Caledonia	High	37.8
34	Zimbabwe	Low	37.8
35	Iceland	High	37.7
36	United Republic of Tanzania	Low	35.3
37	Lebanon	Upper-middle	32.5

Source: Authors' calculations based on data from UN (available at: <https://comtrade.un.org/data/>).

2.2 Oil and gas

For oil and gas dependence we can assess the situation (also for 2012) by using the detailed UNCTAD data on exports that are available for 215 countries. Those data show that no fewer than 48 countries had oil and gas exports in that year greater than 30 per cent of their total merchandise exports.⁷ These countries are listed in Table 2, which again also shows their World Bank classification (low-income, lower- or upper-middle-income, or high-income).

⁷ This compares with 47 countries in 2011.

Table 2: Oil and gas export dependence in 2012

	Country	Classification	Oil and gas % of total
1	Iraq	Upper-middle	98.8
2	Algeria	Upper-middle	98.4
3	Angola	Upper-middle	98.3
4	Libya	Upper-middle	97.3
5	Timor-Leste	Lower-middle	97.1
6	Brunei Darussalam	High	96.2
7	Equatorial Guinea	High	95.0
8	Chad	Low	93.7
9	Nigeria	Lower-middle	93.5
10	Azerbaijan	Upper-middle	93.4
11	Qatar	High	91.4
12	Kuwait	High	90.9
13	Congo	Low	88.2
14	Yemen	Lower-middle	85.9
15	Saudi Arabia	High	85.2
16	Aruba	High	81.9
17	Venezuela	High	81.2
18	Gabon	Upper-middle	78.7
19	Gibraltar	High	73.7
20	Oman	High	71.2
21	Iran (Islamic Republic of)	Upper-middle	70.4
22	Russian Federation	High	70.3
23	Kazakhstan	Upper-middle	69.9
24	Norway	High	69.8
25	Bahamas	High	66.0
26	Colombia	Upper-middle	65.7
27	Trinidad and Tobago	High	64.9
28	Turkmenistan	Upper-middle	62.6
29	Ecuador	Upper-middle	57.8
30	United Arab Emirates	High	57.4
31	Bolivia (Plurinational State of)	Lower-middle	50.9
32	Cameroon	Lower-middle	50.4
33	Bahrain	High	41.5
34	Malta	High	41.2
35	Korea, Dem. People's Rep. of	Low	40.1
36	Myanmar	Lower-middle	39.3
37	Cyprus	High	38.1
38	Greece	High	37.0
39	American Samoa	Upper-middle	36.7
40	Egypt	Lower-middle	36.0
41	Mozambique	Low	35.8
42	Niger	Low	35.6
43	Belarus	Upper-middle	35.6
44	Sudan	Low	34.2
45	Indonesia	Lower-middle	33.3
46	Guam	High	32.9
47	Saint Lucia	Upper-middle	31.8
48	Ghana	Lower-middle	30.5

Source: Authors' calculations based on data from UN (available at: <http://unctadstat.unctad.org/EN/>).

It should be noted that 19 of the countries listed are classified as high-income (shaded rows), which means that the remaining 29⁸ countries are either low- or middle-income.

It is noteworthy also that only three countries appear in *both* Table 1 (minerals) and Table 2 (oil and gas). These are the Democratic Republic of Korea, Mozambique, and Sudan.⁹ Thus the combining of the two tables would show that in 2012 there were no fewer than 58 low- and middle-income countries (32 plus 29 minus 3) that could be said to be highly dependent on extractive industries—at least in the dimension of their export trade.

3 Changes in extractives dependence since 1996

Unfortunately, the full MCI data have been produced only for the years back to 2012. So, in order to examine changes in dependence over an extended period, we once again need to rely mainly on the UNCTAD export trade data. Changes over time were assessed by looking first at just the 58 low- and middle-income countries identified in Tables 1 and 2¹⁰ and comparing their levels of export dependence on extractives in 1996, 2012, and 2014 (the latest year for which UNCTAD data are available). The shaded rows of Table 3 show the results of this over-time comparison, with the percentage point changes (1996–2012 and 1996–2014) given in the last two columns. We have supplemented the list of 58 countries with data for a further 9 countries (in bold type), where the joint contribution of minerals and oil and gas exports brings the 2014 level of export dependence above the 30 per cent cut-off that was used for both Table 1 and Table 2. These additional countries are Liberia, Madagascar, Togo, India, Kyrgyzstan, Senegal, Uzbekistan, Fiji, and Panama. Finally, we have shown a few countries (in italic type) that have large exports of extractives but do not quite attain the 30 per cent cut-off point. The results are shown for both metals and for the total of metals and oil and gas.

The results of the comparisons are clear and unambiguous. The final two columns of Table 3 show that for most of the countries listed there was a strong and positive increase in their levels of dependence on the export of extractives from 1996 onwards. Between 1996 and 2012, no fewer than 63 of the 72 countries listed saw increases in their export dependence ratios,¹¹ the percentage point increases being as high as 94 per cent (Chad), 76 per cent (Sudan), 64 per cent (Mozambique), and 54 per cent (Lao). Only 9 countries saw a decline in the ratio in that period (figures shown in white on black). The simple average increase over that 16-year period was 18 percentage points.

For the longer period, from 1996 to 2014, the changes were still predominantly upwards but slightly smaller in magnitude: the simple average increase across all the countries was 17 percentage points. In that period, 10 of the 72 countries listed saw falls in their levels of extractives dependence (white on black), but 62 countries saw increases.¹²

⁸ This compares with 30 in 2011.

⁹ Interestingly, there were also three (different) overlap countries in 2011: Bahrain, Bolivia, and Guinea.

¹⁰ For some of these countries the over-time comparison was not possible because of missing data in the earlier year.

¹¹ When the comparison is run from 1996 to 2011 (rather than 2012), 58 of the total of 68 countries saw increases.

¹² For the comparisons from 1996 to 2011, these numbers change to 11 countries seeing falls and 57 countries seeing increases.

Table 3: Changes in extractives export dependence since 1996

	Income	Country	Minerals as % of total			Minerals incl. coal and oil & gas as % of total			Change 1996 to 2012 (percentage points)	Change 1996 to 2014 (percentage points)
			1996	2012	2014	1996	2012	2014		
1	Low	Benin	1%	21%	12%	5%	37%	26%	31%	21%
2	Low	Burkina Faso	8%	46%	50%	23%	46%	57%	23%	33%
3	Low	Central African Republic	56%	44%	45%	56%	45%	46%	-12%	-10%
4	Low	Chad	0%	0%	0%	0%	94%	94%	94%	94%
5	Low	Dem. Rep. of the Congo	72%	81%	78%	83%	92%	93%	9%	10%
6	Low	Eritrea	62%	61%	36%	63%	61%	36%	-2%	-27%
7	Low	Guinea	76%	60%	53%	81%	87%	92%	7%	11%
8	Low	Korea, Dem. People's Rep.	9%	16%	15%	11%	56%	50%	44%	39%
9	Low	Liberia	49%	24%	43%	50%	41%	44%	-9%	-7%
10	Low	Madagascar	8%	18%	34%	11%	20%	36%	9%	25%
11	Low	Mali	8%	42%	47%	10%	43%	50%	33%	40%
12	Low	Mozambique	6%	36%	42%	8%	72%	68%	64%	61%
13	Low	Niger	21%	22%	21%	40%	57%	57%	17%	17%
14	Low	Rwanda	3%	39%	45%	3%	47%	55%	44%	52%
15	Low	Sierra Leone	28%	51%	46%	29%	51%	46%	22%	17%
16	Low	Togo	33%	28%	18%	40%	43%	34%	3%	-6%
17	Low	United Republic of Tanzania	4%	35%	33%	4%	37%	34%	32%	30%
18	Low	Zimbabwe	15%	27%	19%	17%	38%	31%	22%	14%
19	Lower-middle	Armenia	25%	45%	47%	27%	50%	52%	23%	25%
20	Lower-middle	Bhutan	3%	15%	16%	23%	36%	27%	12%	4%
21	Lower-middle	Bolivia	30%	30%	27%	43%	81%	81%	38%	38%
22	Lower-middle	Cameroon	5%	5%	3%	40%	5%	57%	-36%	16%
23	Lower-middle	Congo	2%	4%	8%	87%	92%	92%	5%	5%

24	Lower-middle	Côte d'Ivoire	1%	6%	6%	16%	35%	26%	19%	10%
25	Lower-middle	Djibouti	6%	17%	17%	30%	23%	25%	-6%	-4%
26	Lower-middle	Egypt	5%	9%	7%	56%	45%	35%	-11%	-22%
27	Lower-middle	Ghana	28%	18%	21%	33%	48%	55%	15%	22%
28	Lower-middle	Guyana	37%	58%	52%	37%	59%	52%	21%	14%
29	Lower-middle	India	16%	11%	12%	18%	30%	31%	12%	14%
30	Lower-middle	Indonesia	6%	7%	6%	32%	41%	35%	9%	3%
31	Lower-middle	Kyrgyzstan	7%	17%	26%	22%	31%	37%	9%	15%
32	Lower-middle	Lao People's Dem. Rep.	1%	39%	30%	2%	55%	45%	54%	43%
33	Lower-middle	Lesotho	4%	44%	38%	4%	44%	38%	41%	34%
34	Lower-middle	Mauritania	36%	63%	59%	36%	72%	68%	36%	31%
35	Lower-middle	Myanmar	8%	18%	19%	8%	58%	35%	49%	27%
36	Lower-middle	Nigeria	0%	1%	1%	94%	94%	95%	0%	1%
37	Lower-middle	Papua New Guinea	24%	51%	39%	55%	69%	70%	14%	15%
38	Lower-middle	Senegal	10%	13%	16%	29%	34%	36%	5%	7%
39	Lower-middle	Sudan	4%	46%	25%	4%	80%	88%	76%	84%
40	Lower-middle	Tajikistan	30%	59%	49%	33%	60%	51%	27%	18%
41	Lower-middle	Uzbekistan	10%	19%	35%	16%	26%	52%	10%	36%
42	Lower-middle	Yemen	1%	3%	3%	94%	89%	91%	-5%	-3%
43	Lower-middle	Zambia	76%	69%	69%	80%	70%	71%	-10%	-9%
44	Upper-middle	Albania	9%	12%	8%	15%	38%	27%	23%	12%
45	Upper-middle	Algeria	1%	0%	0%	78%	99%	98%	20%	20%
46	Upper-middle	American Samoa	0%	3%	5%	0%	40%	5%	40%	5%
47	Upper-middle	Angola	5%	1%	2%	99%	100%	100%	1%	1%
48	Upper-middle	Azerbaijan	2%	1%	1%	64%	94%	94%	30%	30%
49	Upper-middle	Belarus	1%	1%	1%	9%	36%	34%	27%	25%
50	Upper-middle	Botswana	81%	92%	92%	81%	92%	92%	11%	11%
51	Upper-middle	Brazil	12%	17%	16%	12%	28%	26%	16%	14%
52	Upper-middle	Bulgaria	10%	17%	15%	16%	34%	27%	17%	11%

53	Upper-middle	Colombia	4%	7%	4%	40%	73%	70%	33%	30%
54	<i>Upper-middle</i>	<i>Cuba</i>	16%	22%	20%	17%	33%	28%	16%	11%
55	Upper-middle	Ecuador	3%	2%	5%	39%	60%	56%	21%	17%
56	Upper-middle	Fiji	9%	9%	6%	10%	34%	31%	25%	21%
57	Upper-middle	Gabon	4%	6%	7%	83%	85%	72%	2%	-11%
58	Upper-middle	Iran	1%	5%	6%	81%	75%	71%	-6%	-10%
59	Upper-middle	Iraq	0%	0%	0%	85%	99%	98%	15%	13%
60	Upper-middle	Jamaica	50%	39%	48%	50%	62%	69%	12%	19%
61	Upper-middle	Kazakhstan	20%	14%	9%	53%	84%	87%	31%	34%
62	Upper-middle	Lebanon	11%	32%	26%	11%	35%	30%	24%	19%
63	Upper-middle	Libya	0%	1%	2%	94%	98%	97%	5%	3%
64	<i>Upper-middle</i>	<i>Malaysia</i>	1%	3%	3%	9%	23%	25%	14%	16%
65	Upper-middle	Mongolia	57%	75%	64%	58%	86%	93%	29%	35%
66	Upper-middle	Namibia	38%	53%	38%	40%	54%	40%	15%	0%
67	Upper-middle	Panama	3%	3%	5%	9%	15%	32%	7%	23%
68	Upper-middle	Peru	48%	60%	54%	55%	72%	66%	17%	11%
69	Upper-middle	Saint Lucia	0%	2%	2%	0%	34%	33%	34%	33%
70	Upper-middle	South Africa	30%	33%	33%	41%	42%	43%	1%	2%
71	Upper-middle	Suriname	69%	76%	23%	73%	85%	37%	12%	-36%
72	Upper-middle	Turkmenistan	1%	0%	1%	75%	63%	89%	-12%	15%

The shaded countries are those from Tables 1 and 2 above.

Bold type indicates countries where the joint minerals plus oil and gas export contributions bring the dependence ratio above 30 per cent by 2014.

Italic type indicates countries that have large exports of extractives but do not quite attain the 30 per cent cut-off point.

Figures in white on black in the final two columns indicate a decline.

Source: Authors' calculations based on data from UN (available at: <http://unctadstat.unctad.org/EN/>).

Among the 18 *low-income* countries that are listed, 15 saw an increase in dependence ratio up to 2012 and 14 saw an increase up to 2014.

Of the 25 *lower-middle-income* countries, 20 saw an increase and 1 no change (Nigeria) to 2012, and the same 21 countries saw an increase to 2014.

The conclusion from this set of simple over-time comparisons is quite clear: dependence on the extractive industries has increased in the 18-year period between 1996 and 2014 in low- and middle-income countries, which are the main concern of this paper. The high level of dependence that we identified in Section 2 for the year 2012 was largely sustained until 2014 and has been the result of an extended period of change from 1996 onwards, during which the general tendency has been for greater, rather than reduced, dependence.

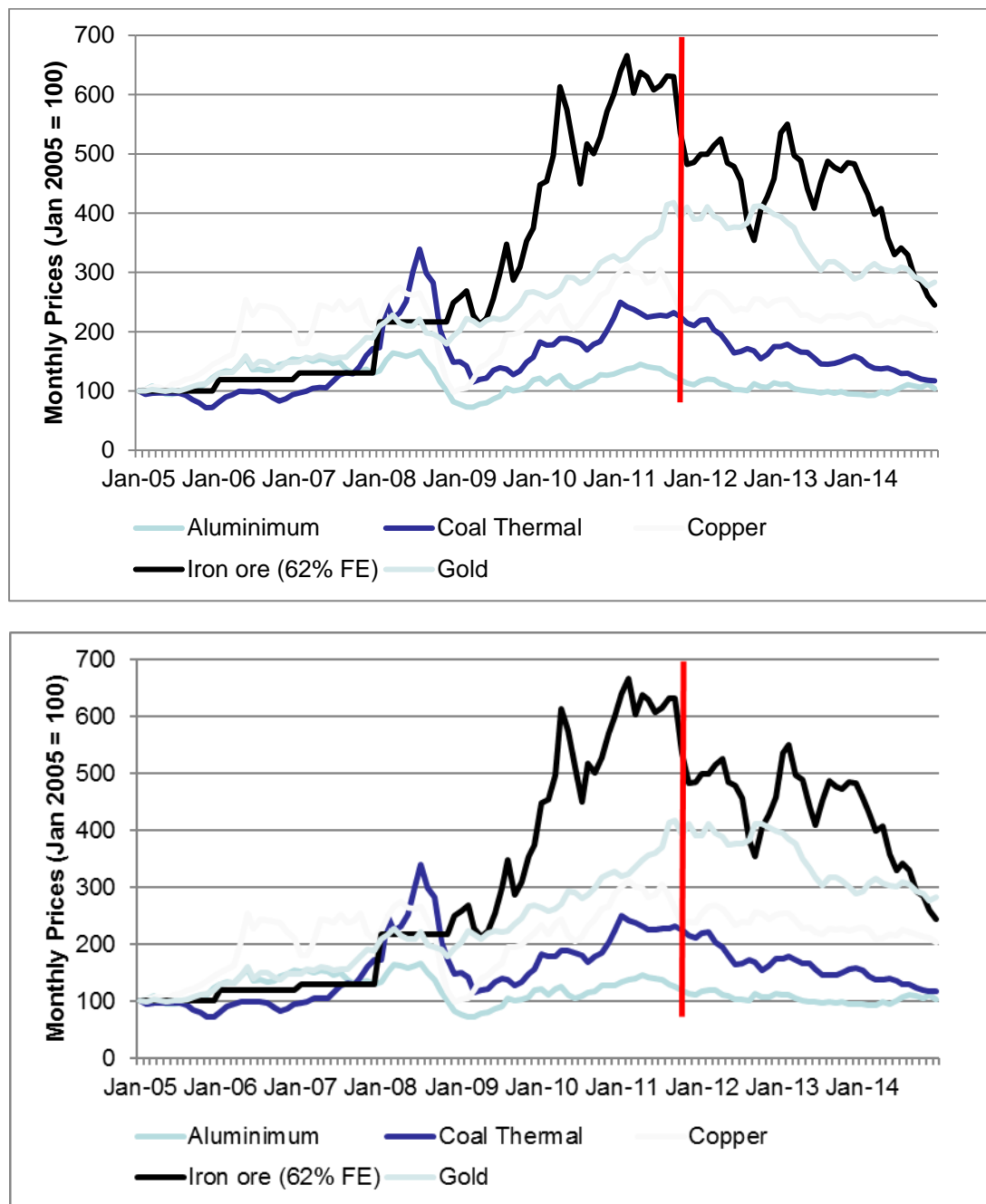
However, we need to be aware of certain limitations of this analysis: in particular, it is for the moment based predominantly on export trade data and it extends only to 2014. Correction for these limitations would be likely to strengthen the main conclusions for several reasons. First, there are a number of newer extractive countries, such as Afghanistan, Kenya, and Uganda, for which the 2014 UNCTAD data do not yet capture the increases in dependence ratios that seem likely to occur in the next few years. By 2014, Afghanistan and Kenya, for example, had export dependence ratios of 19 per cent and 12 per cent, respectively, and these seem certain to rise in future years. Second, there are some very important extractives producers that are not statistically important in the export markets. These include principally China (15.8 per cent of world metal production in 2012), Brazil (8.5 per cent), and India (3.4 per cent). The inclusion of these large producers in the data sets would obviously strengthen our main conclusion.

4 The impact of the end of the commodity price cycle

It is difficult to date precisely the point at which the so-called ‘super cycle’ of commodity prices ended. As shown in Figure 1, the prices of different metal commodities headed south around 2011, but did so at various dates and with various degrees of associated volatility. But it is clear, in the case of metals at least, that the downward tendency of prices was well established by 2012. The same is true of the crude oil price (Brent oil prices hit a high of US\$127 a barrel in April 2011 as the conflict in Libya shut down its supplies). It is too early to say what longer-term effect the price falls of the past four years will have on the levels of extractives dependence in the countries we have identified. Although significant extractives capacity has been mothballed, it is not clear how much may eventually be closed or how much planned new investment will eventually have to be cancelled. For some metals, including copper, the price falls to date have arguably been offset by lower production costs and have affected only the very highest-cost producers.¹³

¹³ For example, a March 2015 press release by SNL Metals noted that the copper price had fallen to a level just above the 9th decile of high-cost producers, which indicated, they argued, that the copper price would need to fall further before significant capacity became vulnerable to closure. Also ‘the [...] spot price of copper averaged only US\$5,700/t in February, but remains comfortably above SNL’s prediction of this year’s average mined cost of 168c/b, calculated on a co-product basis.’

Figure 1: Monthly commodity prices for metals

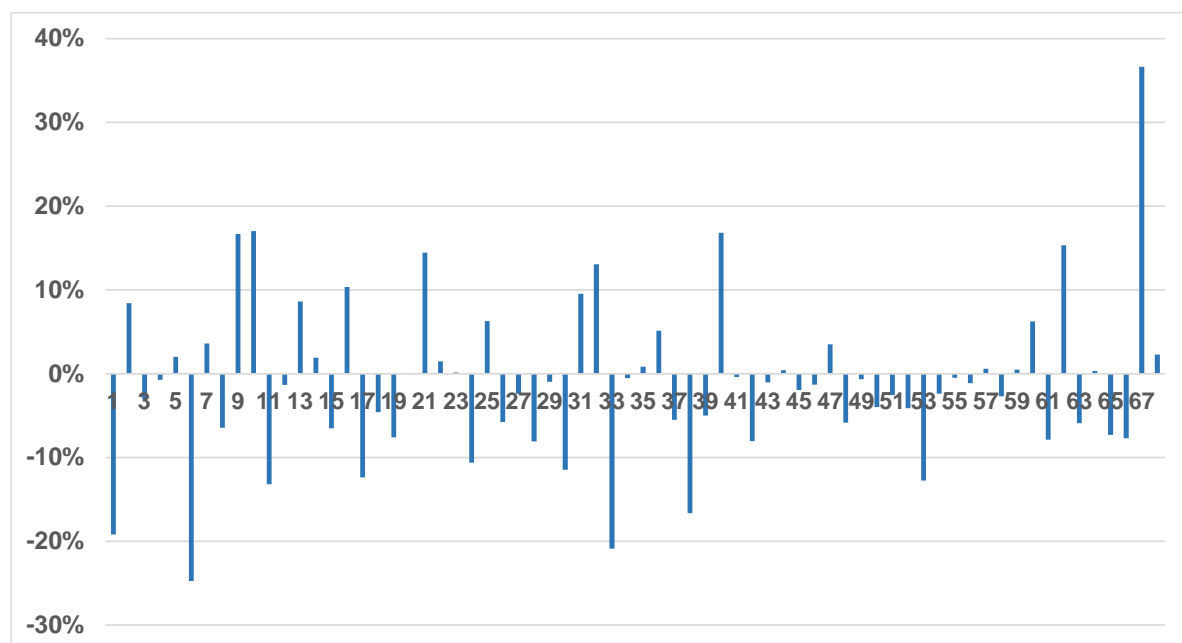


Source: SNL Metals.

Data such as those shown in Table 3 enable us to tell merely an initial and partial story about the impact of the price collapse on the levels of extractive industry dependence. We have used 2011 as the assumed start date of the commodity price collapse, although in reality the actual start date was somewhere between 2011 and 2012. Data comparable to those shown in Table 3 were compiled for 68 countries¹⁴ for both 2011 and 2014 and then compared. The results of this for these 68 countries are shown in Figure 2.

¹⁴ These 68 countries emerged from the 2011 data in the same way that the 72 countries in Table 3 emerged from the 2012 data (see the explanations in Section 3 above).

Figure 2: Change in export dependence—extractives, 2011–2014 (%)



Source: Authors' calculations.

The results of this limited experiment are ambiguous. Using the new data, 42 of the 68 countries did experience some decline in measured export dependence between 2011 and 2014. In 9 country cases, this decline was large, at more than 10 percentage points.¹⁵ In the other 33 cases of decline, the decline was quite small. By contrast, in 26 country cases there was no decline—rather an increase in measured dependence with quite substantial percentage point increases in many cases. These results suggest that the commodity price collapse did indeed disrupt the previously strong upward tendency in extractives dependence evidenced in the earlier part of this paper. However, that disruption was not general across all countries and a significant number among the 68 saw an ongoing and often strong increase in their levels of dependence. We will need to await the similar data up to 2016 to see whether this somewhat ambiguous pattern has persisted.

5 Implications of high extractives dependence

The final section of this paper is intended to provide an assessment of the some of the implications for low- and middle-income countries of the high levels of extractives dependence that the paper has identified. The material presented here is highly derivative from the published work of others and is intended mainly to support a broader debate on the topic. The discussion is sub-divided between the short-term consequences and the longer-term perspective.

¹⁵ These nine countries were Eritrea (25%), Myanmar (21%), Benin (19%), Syrian Arab Republic (17%), Gabon (13%), Mali (13%), Tanzania (12%), Egypt (11%), and Lao People's Dem. Rep. (11%).

5.1 Short-term consequences

Several papers have been published in the past three years or so assessing the implications for developing economies of the sharp drop in the prices of commodities in general but extractive products in particular.¹⁶ Thomas Lassourd and David Manley of the Natural Resources Governance Institute (NRGI) have identified 10 significant economic and political consequences.¹⁷ Foremost among these are the significant losses of *fiscal revenue* and the associated painful fiscal adjustment that many extractives-dependent economies now face. They note that these pressures apply also to some richer economies, such as Saudi Arabia and Norway, that have large, established reserve funds, which can absorb some of the pressures. This mitigating factor, however, is not applicable to all extractives-dependent countries or indeed to most of the low- and middle-income economies that are our main concern: the authors mention the cases of Yemen (a low-income country with a projected fiscal deficit of 10 per cent of GDP) and Venezuela (a high-income country with inflation of over 200 percent and a projected fiscal deficit of almost 20 per cent of GDP).¹⁸ Further, anticipating a later paper in this series (Solimano forthcoming), it is well known that some countries (notably Chile) have strong counter-cyclical fiscal arrangements in place that can mitigate some of the consequences of lower prices, but most countries do not.

As a consequence of lower prices for their extractive exports, many dependent economies can also expect depreciating *exchange rates* and higher rates of *inflation* in addition to the inevitable impact on real incomes that lower prices will cause. The lower prices are also likely to affect prospective income, as many of the early-stage exploratory investments in certain lower-income countries are delayed or even abandoned. Lassourd and Manley (2015) mention important prospective investments in the cases of Guinea (iron ore), Mozambique (oil and gas), Uganda (oil), and Tanzania (natural gas), but there are many others. ICMM (2016) provides evidence of an 80 per cent decline in exploration spending by major mining companies between 2012 and 2015.

However, not all of the consequences are necessarily negative and some opportunities are also referred to. Foremost among these are the opportunities that are presented by much lower fuel prices to reduce or eliminate longstanding but fiscally costly fuel subsidies: an example of a country where this opportunity is being seized is Indonesia. It might be added that Tanzania has been fortunate in timing in that its new near-shore gas came on stream in late 2015 and is already fuelling new gas-fired power generation near Dar es Salaam that is enabling the government to reduce its dependence on high-cost imported feedstocks and so reduce associated large fiscal subsidies (a parallel paper in this series by Olle Östensson and Anton Löf discusses this example in more detail¹⁹). Lassourd and Manley (2015) also suggest that a period of low fuel prices provides an opportunity for governments to introduce or raise carbon taxes and other measures to discourage fossil fuel consumption and encourage the greater uptake of renewables.

Finally, they draw attention to a range of *political* consequences that could arise from lower prices. For example, lower prices could either mitigate or exacerbate political repression in countries like

¹⁶ For example, Zhenbo Hou et al. (2015). However, as an indication of how quickly things have changed, another ODI paper, published as relatively recently as August 2012, was still mainly concerned with the very *high* prices (for oil) and predicting that ‘in terms of real GDP, African countries may suffer up to a 3% loss from a doubling of oil prices’ (Cantore et al. 2012).

¹⁷ Lassourd and Manley (2015).

¹⁸ These are the figures quoted by the authors and are not necessarily the most up-to-date figures. In the case of Venezuela, there has been no formal IMF Article IV review since 2004. See also Roe (2016).

¹⁹ See also Roe (2016).

Azerbaijan, and ongoing resource-related conflicts in Libya, South Sudan, and Iraq. Potentially, lower resource revenues available for governments ‘to buy social peace’ might spark conflict in countries such as Bahrain, where they argue that the leaders have used resource revenues to keep a lid on growing discontent. More generally, ‘a decline in natural resource prices will reduce the incumbency advantages held by the leaders controlling the tap’ (Lassourd and Manley 2015).

The manner in which these potential impacts will apply in practice is obviously country- and case-specific. For example, countries dependent on gold mining have faced smaller fiscal and other economic problems because of the relative strength of the gold price. But few if any of the 72 most extractives-dependent economies that this paper has identified will be able to escape all of the consequences. So there is undoubtedly a very large agenda of work needed in most of those countries to address the situation that they are now experiencing—and will continue to experience for as long as commodity prices remain relatively low.

5.2 The longer-term perspective

The purpose here is to identify some of the (positive) longer-term aspects of resource dependence for the type of country we have identified. The ideas are based squarely on the detailed analysis published in December 2013 by the McKinsey Global Institute. Although this study was published before the commodity price slump intensified, many of its broad findings remain relevant to the majority of the 72 countries we have identified.

McKinsey (2013b) identified four main drivers of what it terms ‘resource market dynamics’. These are:

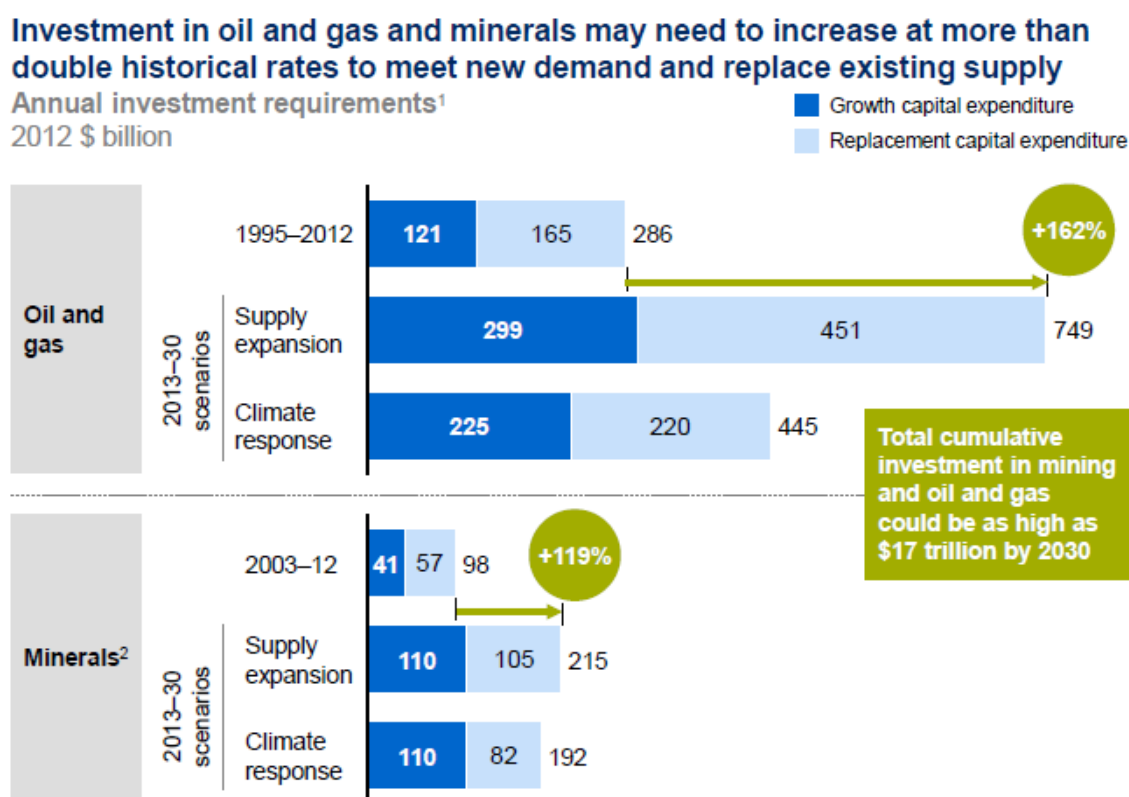
- The growing levels of global market demand for resources, including minerals and oil and gas (evidenced also by an earlier study, McKinsey 2013a)²⁰
- The gradual shift of the sources of supply to more challenging locations—many in less-developed countries
- The environmental pressures that will both raise the costs of mining and constrain outputs (especially of carbon-intensive fuels)
- The technology improvements that will allow more efficient and lower-cost extraction and extraction in more difficult sites.

The influences of these various component drivers on future levels of demand for extractive products, the outputs of such products, and the costs of producing them are to an extent offsetting. Overall, however, the perspective that McKinsey presents is one that will require investment in mineral and oil and gas extraction of between US\$11 trillion and US\$17 trillion cumulatively by 2030. This is 65 per cent higher than the historical annual rate of investment in these sectors, even when it allows for the reducing effects of climate change initiatives. Figure 4 summarizes McKinsey’s various historical and projected data on the investments needed in these sectors both to replace existing supplies and to provide net new capacity. This is done using two alternative scenarios. The first assumes a supply change that allows for ‘business-as-usual’ improvements in resource productivity (e.g. more efficient vehicles). The second builds in larger supply reductions

²⁰ As one aspect of this, McKinsey draws on OECD forecasts that the numbers of global middle-class consumers will increase by 3 billion over the next 20 years. The research defines ‘middle-class’ as having daily per capita spending of US\$10 to US\$100 in PPP terms and is based on a 2010 paper by Homi Kharas (2010). Increased income inequality would likely add to the estimated number of middle-class consumers. A faster rate of change in energy efficiency would somewhat dilute the estimated impact on resource needs.

due not only to productivity improvements but also to changes in the energy supply mix towards the greater use of renewables.²¹

Figure 4: Investments in oil and gas, and minerals, 1995–2030



Source: Exhibit 5 in McKinsey Global Institute (2013b: 31).

It needs to be recognized that these McKinsey scenarios were constructed at a time when the decline in commodity prices was only in its early stages (2012/13). The large declines in some prices since then will have affected the realism of those scenarios, but to what extent we do not know. However, as we can see from Figure 3, we would need to reduce the smaller of the two projected investment amounts (the scenario that factors in climate change responses) by almost 40 per cent in the case of oil and gas before it would become equal to the 1995–2012 annual average investment (i.e. from US\$445 billion to US\$286 billion) and by almost 50 per cent in the case of minerals before it would become equal to the 2003–2012 annual average (i.e. from US\$192 billion to US\$98 billion). Any re-running of the McKinsey scenarios would be unlikely to reduce the projected figures by such large percentage amounts.²² So it seems safe to assume that a feasible scenario to 2030 would still show the necessary levels of future new investment to be high relative to the historical averages. Since the historical period used in the McKinsey analysis (1995–2012) coincides with the period for which we have shown extractives dependence in many low- and middle-income countries to have risen significantly (Table 3), it is a further reasonable assumption that that level of dependence will be sustained until 2030 and may even increase further.

²¹ McKinsey (2013b: appendix 1).

²² Further, we can expect that lower prices and their consequences will in some cases erode the earlier enthusiasm for climate change adjustments. A current example is very high energy prices in the UK, which threaten the survival of domestic steel production (an intensive user of fossil fuels), that these have now been shown to create.

This being the case, there are substantial potential opportunities for the developing countries that produce minerals and/or oil and gas. In terms of investment, McKinsey (2013b) suggests that in its ‘potential upside’ case, up to US\$3 trillion of the total global investment in scenario 1 could be expected to be invested in low- and low-middle income countries (cumulatively by 2030). This would represent a tripling of the levels of investment in the extractives sectors seen in those countries since 1995. Even in its lower, ‘base case’, scenario the cumulative investment in these countries could be at an annual rate 50 per cent higher than in the past twenty years. McKinsey further estimates that on some assumptions this investment and the growth that it could sustain could lift some 540 million more people out of poverty—a figure higher than the poverty reduction achieved in China in the previous twenty years.²³

If one accepts the McKinsey investment scenarios (or something close to them), the *necessary* conditions for this dramatic gain in investment and living standards can be expected to be in place over the next few years. However, the *sufficient* conditions (in terms of governance arrangements, supporting infrastructure, etc.) are certainly not guaranteed to be available to deliver the full pay-off that seems to be possible. Indeed, one of the central purposes of this and other papers in this series is to explore in some detail what these further conditions might be and how they might be enhanced through the work of a range of actors—government, companies, donors, and others.

In the partial absence of these further conditions, one needs to take on board the warning notes also voiced by the McKinsey study. This showed that between 1995 and 2011 (broadly the period over which we have reviewed the change in extractives dependence), some 52 per cent of the lower-income resource-driven countries of the world had failed to make significant progress in catching up with the incomes of higher-income countries.²⁴ The slightly more positive insight was that, of the 77 per cent of resource-driven countries with below-average per capita income (of US\$10,000) in 1995, 48 per cent did achieve some catch-up.

6 Conclusions

The statistics outlined in this paper highlight several important facts that have significant implications for many low- and middle-income countries. Three points are particularly salient. First, although high-income countries dominate extractives production figures, countries with the highest levels of export dependence on extractives are predominantly low- and middle-income countries. Second, export dependence has shown a clear upward trend, with sustained increases in most countries over the last two decades. Finally, although the overall trend since the end of the commodity super cycle is somewhat ambiguous, this upward trend has nevertheless continued in many countries despite the recent commodity price collapse.

High levels of export dependence in many low- and middle-income countries, coupled with lower commodity prices, have serious economic and political implications for these countries. The primary economic concerns over the short and medium term are loss of fiscal revenue, exchange rate depreciation, higher inflation, and a reduction in real income. While the principal economic impacts are negative, lower prices do open up the possibility of reform of costly fuel subsidies and the introduction of carbon taxes, both of which would be positive developments. Political

²³ McKinsey (2013b: 33, exhibit 7).

²⁴ McKinsey (2013b: 34, exhibit 8).

implications are more ambiguous; it is unclear whether the reduced prices will exacerbate or mitigate political repression and (current and potential future) resource-related conflicts.

Projected trends in investment suggest that, despite reduced commodity prices, investment in extractive industries over the next 15 years is likely to be high relative to historical averages. This suggests that, over the longer term, dependence on extractives in low- and middle-income countries may increase further. Increased investment could lead to improved living standards. However, this outcome is contingent upon the decisions and actions of a range of actors, including government, companies, and donors.

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