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## Research Report

# Indebted: How to support countries heavily reliant on oil and gas revenues to secure long-term prosperity

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**ODI**

Report

# Indebted: how to support countries heavily reliant on oil and gas revenues to secure long-term prosperity

**Shandelle Steadman, Ipek Gençsü, Shakira Mustapha, Sarah Colenbrander and Judith Tyson**

**June 2023**



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# Acronyms/Glossary

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<b>COP</b>	Conference of the Parties
<b>G20</b>	Group of Twenty
<b>GDP</b>	Gross domestic product
<b>IEA</b>	International Energy Agency
<b>IMF</b>	International Monetary Fund
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>JETP</b>	Just Energy Transition Partnership
<b>LIC</b>	Low-income country
<b>LMIC</b>	Lower-middle income country
<b>NGFS</b>	Network for Greening the Financial System
<b>NRGI</b>	Natural Resources Governance Institute
<b>ODA</b>	Official Development Assistance
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>RBL</b>	Resource-backed loans
<b>RGI</b>	Resource Governance Index
<b>SLB</b>	Sustainability-linked bonds
<b>SOE</b>	State-owned enterprise
<b>UMIC</b>	Upper-middle income country
<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>V20</b>	Vulnerable Twenty Group



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# Executive summary

Average global temperatures are already 1.1°C above pre-industrial levels, with profound impacts on food and water security, human health and economic productivity (Pörtner et al., 2022). Limiting global warming to 1.5°C above pre-industrial temperatures – the global target agreed by all nations to minimise the extent of climate change – is incompatible with new oil, gas or coal projects anywhere in the world (IEA, 2021a). Furthermore, achieving this temperature target demands a rapid phaseout of fossil fuel production (Calverley and Anderson, 2022).

The stark reality is that many countries rely on fossil fuel extraction and exports as a major source of revenue to deliver public services and repay government debt. Many of these countries already face other major – and related – challenges to achieving their development goals, including high levels of macroeconomic instability, weak governance, large infrastructure gaps and powerful incumbents resistant to phasing out fossil fuel production. Phasing out oil and gas production could have profound consequences for citizens' living standards in these contexts. Furthermore, due to a reliance on export revenues to service debts (rather than investment in expanding and diversifying productive capacity), these countries risk being locked into a cycle of indebtedness and fossil fuel dependency. This poses a challenge to securing a timely and just energy transition.

This report examines the relationship between a country's oil and gas dependency and the level, composition and cost of government debt; how this influences the incentives and commitment to phase out oil and gas production in line with global climate goals; and what can be done to enable future prosperity for these countries given the necessity for rapid, global decarbonisation. We explore the interaction between oil and gas prices and public finances over a 11-year period (2010–2020) for a sample of 21 low- and middle-income countries highly dependent on oil and gas revenue.<sup>1</sup> We offer new insights into the distinctive fiscal characteristics of oil- and gas-dependent countries, and how these can exacerbate resource dependency (rather than stimulating economic diversification) and fuel expensive indebtedness (rather than expanding the resource envelope for public services and infrastructure).

The rise in indebtedness among low- and middle-income countries cannot be attributed narrowly to oil and gas dependency: many countries without oil and gas reserves are also facing a debt crisis (Cohen and Harnoys-Vannier, 2023). There are positive factors at play that explain why many low- and middle-income countries were able to borrow more, such as improved public financial management and historically low global interest rates. There are also negative factors, particularly shocks that countries need to respond to through borrowing, including environmental disasters, the Covid-19 pandemic and the repercussions

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1 We selected countries for which fossil fuels account for either a significant share of exports or oil/gas rents are large relative to the size of the economy. The 21 countries in our sample are Algeria, Angola, Azerbaijan, Bolivia, Chad, Colombia, Republic of Congo, Ecuador, Egypt, Gabon, Iran, Kazakhstan, Mozambique, Myanmar, Nigeria, Papua New Guinea, Timor-Leste, Turkmenistan, Uzbekistan, Venezuela and Yemen. For more information about the country selection and methodology, see Section 3.

of the Russian invasion of Ukraine, which have hit lower-income countries especially hard. This report does not test for causality to determine the specific factors driving indebtedness. However, by examining the links between oil and gas dependency and debt, reviewing trends in the data, and drawing on relevant literature on resource governance, our findings demonstrate that oil and gas production *exacerbates* rather than ameliorates fiscal risks. While many commodity exporters face similar challenges, climate change means that the risks associated with oil and gas production are particularly stark – both in terms of the physical impacts of higher average temperatures and the prospects of disappearing export markets leading to fiscal and macroeconomic instability.

It is also important not to cast debt as the villain. If governments borrow judiciously for productive investments, they can expand the economy and generate cash flows so that they can repay their debt. Debt also allows governments to spread the costs of long-term investments over the generations that will enjoy the benefits, enhancing equity. However, unsustainable levels of debt pose a major threat to both development and climate goals. High and growing debt service burdens mean that governments do not have enough fiscal space for other critical expenditures, including health, education and social protection. Governments are also less able to make investments that would boost productivity and diversify economic activity, such as in power generation, transport and digital connectivity.

The debt crisis also poses a threat to countries' ability to respond to the climate crisis. While low-carbon, climate-resilient development yields many benefits in terms of public health, food and energy security, resource efficiency and – of course – climate change mitigation and adaptation, these

pathways typically have higher upfront costs and therefore higher financing needs (Mountford et al., 2018). High levels of indebtedness constrain a country's ability to mobilise the resources necessary for climate-compatible development, thereby risking lock-in to pollution and maladaptation. Fortunately, it is possible for countries to break their fossil fuel production dependency and debt challenges. Following our analysis, we propose a set of solutions to address indebtedness and climate crisis.

## The vicious cycle of indebtedness and oil and gas dependency

**The governments of our sample countries typically increased borrowing when oil and gas prices were high** (which boosts the credit ratings of countries with large reserves, and thus their capacity to borrow in international debt markets) **and when they were low** (to avoid imposing the full cost of declining revenues on their citizens). In most of our sample countries, we found that revenues declined and expenditure was cut when energy prices fell between 2010 and 2020. But expenditure cuts were rarely in proportion to the revenue decline. Expenditure was only cut by more than the decline in revenues in four out of the 21 countries: Angola, Venezuela, Mozambique and Chad. This has led to larger fiscal deficits and more borrowing in most countries when oil and gas prices fell. Our results also show that international bond issuances expanded significantly in several of our sample countries during periods of high oil and gas prices, increasing their total 'external debt stock' – the portion of a country's debt borrowed from foreign lenders and that must be paid in foreign currency.

**Government debt relative to the size of the economy has been on an upward trend in most fossil fuel revenue-dependent countries.**

Low-income countries in our sample saw gross debt more than doubled between 2010 and 2020, from an average of 37% of GDP to 86%. Between 2010 and 2020, five countries had an increase in gross debt as a percentage of GDP of over 50 percentage points – Angola, Republic of Congo, Gabon, Mozambique and Venezuela. Only Myanmar’s gross debt decreased in this period. Debt appeared to increase most rapidly following the dramatic fall in oil and gas prices in 2014. Between 2014 and 2016, gross debt as a percentage of GDP grew by 30 percentage points or higher in six of our sample countries – the five previously mentioned plus Iran.

**Not only has debt increased as a share of GDP, but the relative share of more expensive debt has grown for almost every country in our sample.** On average, the proportion of external government debt that was provided on concessional terms declined from 27% in 2010 to 16% in 2020. The term ‘concessional’ describes finance that is extended on terms substantially more generous than non-concessional debt, typically from bilateral and multilateral sources. While a few countries have increased the share of concessional debt, most have not. Some of this more expensive debt comes from borrowing from bilateral and multilateral creditors at commercial terms, but many have turned to private creditors, most notably Bolivia (whose borrowing from private creditors increased 85-fold) and Chad (a 75-fold increase). Papua New Guinea, Ecuador and Mozambique saw a 10-fold increase. As countries service this debt (by repaying the principal plus interest), the shift to more expensive forms of debt is reflected in their higher debt service payments. Since 2014, more than 50% of debt service payments of our sample of low-income countries have gone towards repaying non-concessional debt from a combination of bilateral, multilateral and private creditors. The percentage

is even higher for LMICs and UMICs in our sample: in 2018–2020, 89% and 98%, respectively, of debt service payments went towards servicing non-concessional debt.

**Debt servicing accounts for a growing proportion of foreign exchange earnings from exports.** Over the last 10 years, the upper-middle income countries in our sample have seen the share of export revenue going to debt servicing rise from 4% to 8%. This is due to several factors: the increasing debt stock, the shift to more expensive sources of debt and the decline in oil and gas revenues over time. The trend is far more pronounced for Mozambique, the only low-income country in our sample for which this data is available, where the share of export revenue going to debt servicing rose from 3% to 13%.

**Finally, the gap between oil and gas rents on the one hand and debt service payments on the other is narrowing.** As many countries rely on oil and gas rents (a government’s total earnings from their oil and gas production) to service their debt, it is becoming increasingly difficult to do so. Between 2010 and 2019, oil and gas rents decreased in all sample countries – with a major drop in 2014 – except for Myanmar and Papua New Guinea, while debt service payments increased. Between 2010 and 2019, the gap between rents and debt servicing had narrowed in all countries except Myanmar. In seven countries, debt service payments exceeded rents in 2019 (this was the case in only three countries in 2010). This again highlights that, as debt service payments rise, countries will be less incentivised to move away from fossil fuel production, as they would instead prefer to increase production to increase rents.

**As our analysis shows, the high level of dependency on oil and gas revenue makes the phase-out of fossil fuel production seem**

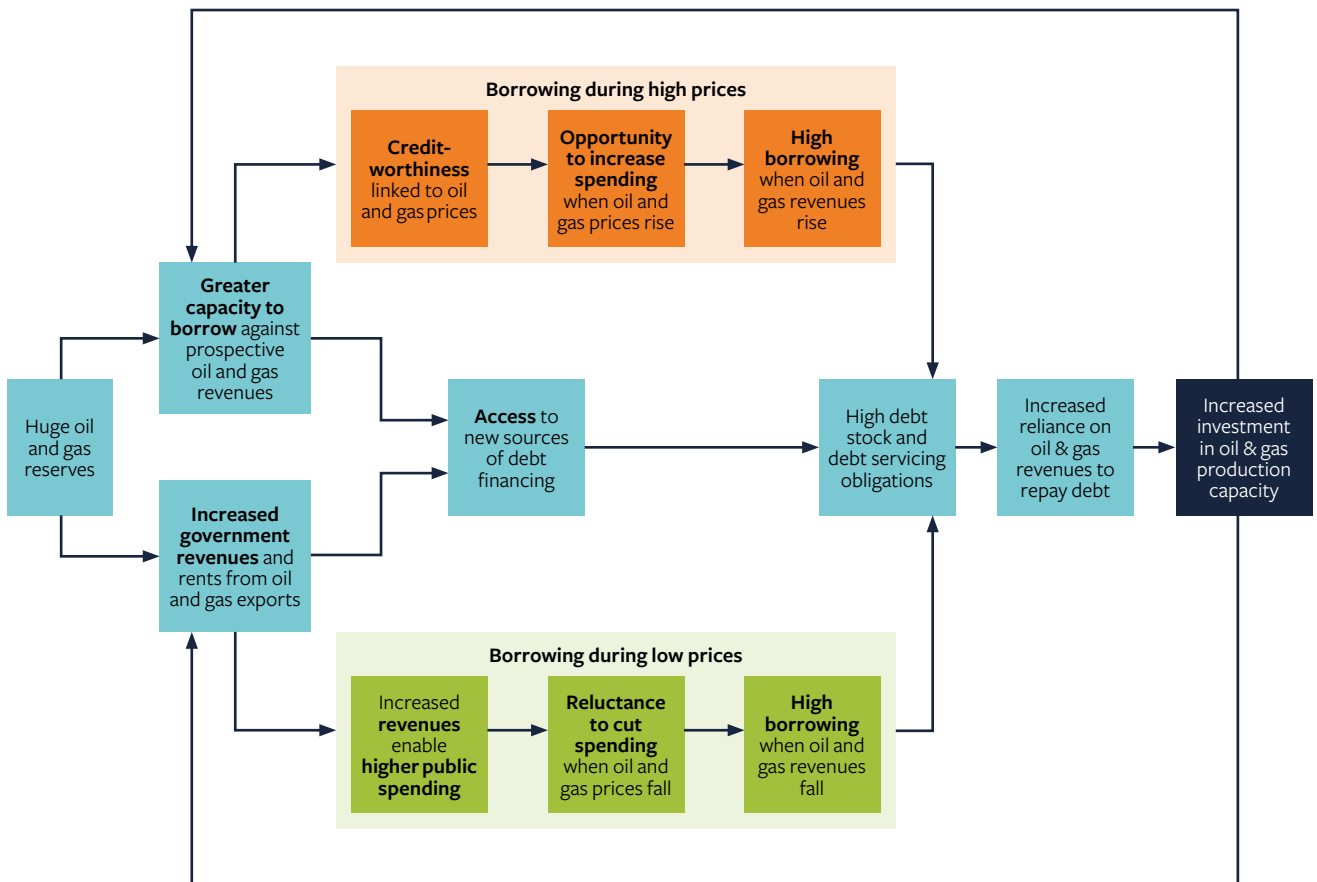
**fiscally irresponsible – despite the urgency of responding to climate change.**

Figure ES.1 summarises some of the key fiscal channels and factors that have driven indebtedness in fossil fuel-rich countries over the last decade: improved creditworthiness during periods of high commodity prices has enabled borrowing (even if production has not yet commenced from oil and gas reserves); a reluctance to cut spending during periods of low commodity prices has fuelled borrowing; weak adherence to fiscal rules during shocks and stresses has undermined responsible public financial management; and the changing composition of countries’ creditors has reduced the affordability of debt.

**Joined-up solutions to indebtedness and climate crisis**

Innovative solutions and strategies are emerging in response to both the debt and climate crises, which can potentially offer politically and economically feasible pathways to phase out fossil fuel production while reducing governments’ debt burden. A combination of domestic action and international support, based on countries’ capabilities and circumstances, can help break the cycle of fossil fuel dependency and borrowing, and enable countries to find more fiscally and environmentally sound financing streams to meet their development and climate needs.

**Figure ES1** How oil and gas production locks nations into indebtedness and further dependency



Source: Authors

**Historical responsibility for climate change sits with high- and upper-middle income countries<sup>2</sup> whose governments and financial institutions hold most of low- and middle-income countries' public debt**, notably China, Japan, the Netherlands, United States, Germany, France, UK, Russia, Austria and Saudi Arabia (Knoema, 2021). Meanwhile, 54 low- and middle-income countries currently face high levels of debt distress (of which seven are in our sample), preventing them from realising either their national development priorities or working towards international climate goals. This is a notable increase on the 27 countries experiencing debt distress or at high risk of debt distress in 2015 (Chabert et al., 2022). Most of these countries are not major fossil fuel producers, including the two that have already defaulted (Sri Lanka and Zambia).

**International creditors need to urgently and collectively offer systemic debt relief or – better yet – debt forgiveness for debtor countries struggling with mounting fiscal and climate-related challenges.** Various actors are calling for decisive action to reform the global debt architecture to enable the investments needed for achieving sustainable development and climate goals around the world. The V20 Group, representing 58 of the world's most systemically climate-threatened economies, under Ghana's presidency of the Group, has outlined reforms on how to make debt work for climate and ensure a world economy fit-for-climate and supportive of its most vulnerable groups. The Paris Club of major creditors, non-Paris club member China and private sector creditors are exploring options for debt restructuring and debt relief with several countries, including Zambia, Ethiopia, Ghana and

Sri Lanka. Perhaps most promisingly, the IMF, World Bank and India (which currently holds the G20 Presidency) are convening a new Global Sovereign Debt Roundtable to agree common principles and approaches for debt restructuring to make the process more effective, time-bound and transparent. The Summit for a New Global Financial Pact, taking place in Paris in June 2023, as well as the Climate Action Summit, the Climate Ambition Summit and the SDG Summit to be held later in the year, are important opportunities to advance the global debt reform agenda.

**In addition to these initiatives and efforts, more transformative solutions are necessary in the face of soaring indebtedness and its human and environmental consequences.**

Given the changing composition of debt highlighted above, it is important that private creditors participate in such systemic debt relief and debt forgiveness initiatives so that taxpayers in high-income countries do not end up cross-subsidising the repayment of private debt – but there are significant barriers to engaging them. In any case, economic recovery and sustainable debt management of debtor countries are in the long-term commercial interest of their private creditors.

**International creditors must begin to adopt financing arrangements that incentivise oil- and gas-rich countries to phase out rather than expand fossil fuel production.** Shifting the international financial architecture in this way will demand a series of incremental reforms, many of which have already been mooted. Promising opportunities include:

<sup>2</sup> Countries responsible for the largest cumulative emissions between 1850 and 2021 include the United States (with 20.3% of the global total), China (11.4%), Russia (6.9%), Brazil (4.5%) and Indonesia (4.1%), followed by Germany, India, the UK, Japan and Canada (Evans, 2021).

- **Bilateral and multilateral donors should align all Official Development Assistance (ODA) and export credits with the temperature targets of the Paris Agreement.** As flagged above, achieving net-zero emissions from the energy sector by 2050 implies that no new oil and gas fields can be approved, and that the international oil supply falls from 91 million barrels per day in 2020 to 24 million in 2050 (IEA, 2021a). If bilateral and multilateral creditors commit to lending and bond purchasing in line with these constraints, concessional finance for fossil fuel production in low- and middle-income countries will rapidly disappear. Oil and gas will therefore have to compete with clean energy sources on a relatively level playing field (although already benefiting from a century of investment in fossil infrastructure).
  - **Central banks are in the process of changing their capital adequacy ratios to manage climate change-related risks to financial institutions and financial stability.** The Network for Greening the Financial System's (NGFS) is currently leading the process of developing global standards for capital adjustments and stress testing for climate risks for financial institutions. The aim is to incentivise them to proactively manage climate risks at an institutional level, incentivise green finance and address systemic financial stability risks that are likely to arise from climate change. It will increase capital requirements – and, hence, increase the cost and potentially reduce the investment appetite – for investments in fossil fuel production (Chenet et al., 2021; NGFS, 2022a; NGFS, 2022b). Continued development and execution of these measures is essential, including overcoming the challenges that are specific to developing countries, such as scarce and poor-quality data, limited expertise and the need to adapt approaches to lower levels of financial development (AfDB, 2021; NGFS, 2022a; NGFS, 2022b).
  - **Private creditors could accept restructuring of existing debt into sustainability-linked bonds (SLBs) and green bonds.** However, restructuring of private debt faces significant challenges. The increased diversity of creditors in the last decade means comprehensive debt restructuring is complex. Private investors are focused on their fiduciary responsibilities to address their investors' self-interest and their participation in debt restructuring processes has been patchy. The G20 Common Framework (CF) was established as a collective forum to negotiate debt restructuring but has been largely ineffective. These barriers will need to be addressed if substantial progress is to be made in this regard, including establishing more effective collective negotiation forums for creditors and creating active incentives for private investors to restructure debt to address climate needs (Georgieva and Pazarbasioglu, 2021).
- The measures proposed above can help to increase the cost of borrowing for oil and gas production and reduce the cost of borrowing for greener investment, and thus begin to break the cycle of indebtedness and dependency.** But on their own, they will not be sufficient to help fossil fuel-producing countries plan, finance and deliver a better future for their citizens. International development and climate finance have a catalytic role to play in supporting structural economic transformation in many of these countries. However, to date it has fallen short: concessional finance has been too slow, resource-intensive and fragmented to meaningfully support countries make a step change towards low-carbon, climate-resilient development (Hadley et al., 2022).
- Over the last two years, a promising new approach to provide international support to national energy transitions has emerged:



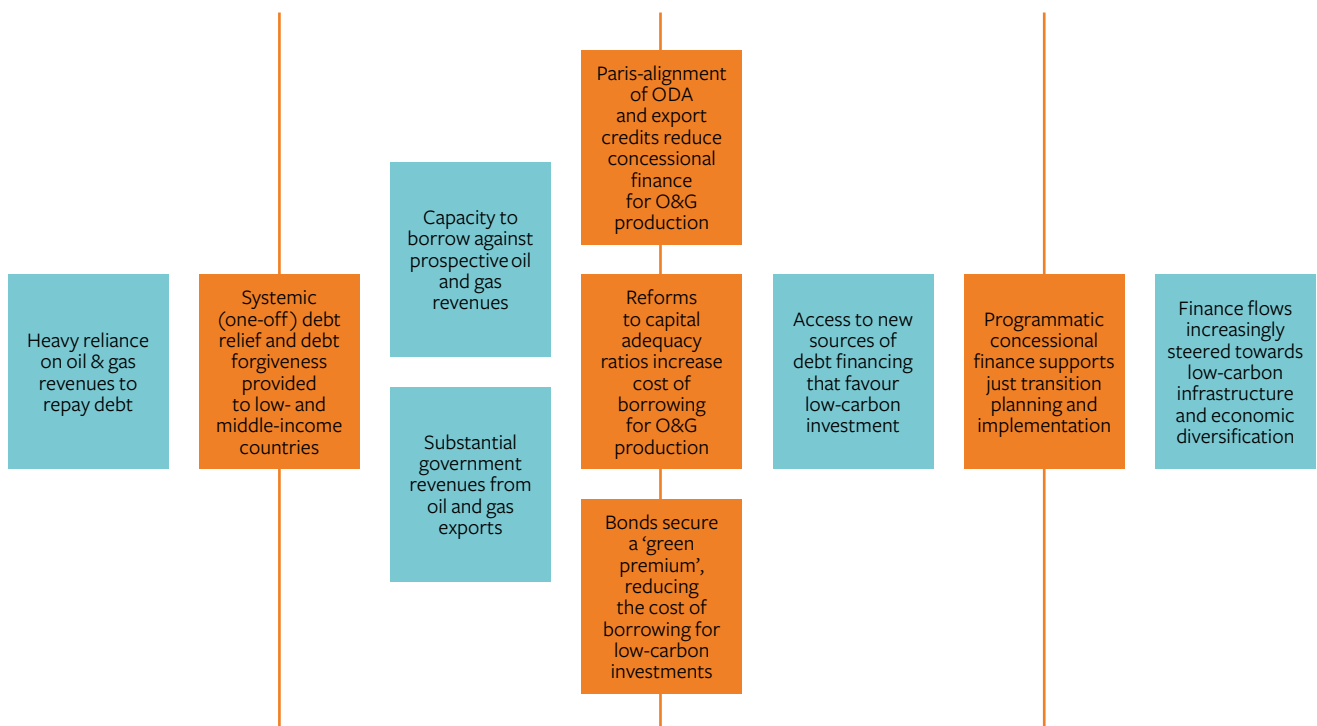
the Just Energy Transition Partnership (JETP) between South Africa and five international partners, the European Union (EU), France, Germany, the UK and the US. Through this deal, announced at COP26 in 2021, the international community committed around \$8.5 billion to support South Africa to decarbonise its power generation sector and stimulate investment in green industry. JETPs have also been announced to support decarbonisation of the power sector in Indonesia and Viet Nam. Despite the complexity of establishing large-scale transformational programmes, if designed and delivered well, these initiatives have the potential to secure the political will and mobilise affordable finance at the scale needed to drive system change. It is also important to note that, to date, the JETPs that have been announced have largely tackled coal-fired power

generation, rather than fossil fuel production. A much more ambitious effort would be required to support oil- and gas-dependent economies in navigating their energy transitions.

**International financial reform and support alone will not be sufficient to break the cycle of oil and gas dependency and indebtedness.**

Two other essential shifts must occur. First, the high levels of demand for oil and gas globally need to be addressed if we are to truly signal the end of the fossil fuel era and an expected fall in prices in the coming years. For this, wealthy countries must show their commitment to rapidly reaching net-zero emissions by putting in place bolder policies to cut down fossil fuel use across their economies, incentivising instead clean energy alternatives and much higher levels of energy efficiency.

**Figure ES2** Interventions by the international community to support countries break the vicious cycle of oil and gas dependency and indebtedness



Second, institutional reforms to improve domestic resource governance and public financial management are essential to reduce rent-seeking, ensure resource revenues are used productively and prepare for energy transition risks. Economic diversification makes good economic sense for oil and gas revenue-dependent economies, because it makes them less reliant on a commodity subject to volatile prices and shrinking markets. Using oil and gas revenues to finance productive investments in mass transit, power generation and promising industries offers the scope to expand the economy, create jobs and upskill the workforce, in comparison to, for example, subsidising fuel consumption, which disproportionately benefits higher-income households.

This study has focused on countries that are highly dependent on oil and gas production and export for public revenues. However, many countries have successfully weaned themselves off commodity dependence, demonstrating that it is possible for low- and middle-income countries to achieve structural economic change. Such a profound economic transition demands far-sighted economic planning, strategic investment in human and physical capital and institutional reforms to improve resource governance and public financial management. Bold domestic leadership is essential. At this critical juncture of rising poverty, soaring indebtedness and climate crisis, the international community must work with highly indebted countries reliant on oil and gas revenues to help them craft and implement a vision for a more prosperous and resilient future.



# 1 Introduction

With average global temperatures now 1.1°C above pre-industrial levels, the catastrophic impacts of climate change are already apparent. The years 2014 to 2021 were the hottest since modern record-keeping began in 1880 (NASA, 2022). Countries all over the world are experiencing devastating shocks and stresses, including sustained droughts, extreme heatwaves, dangerous storms and severe flooding – all exacerbated by changing precipitation patterns and record-breaking temperatures. Climate change impacts will only increase in frequency and severity as average temperatures continue to rise. The Intergovernmental Panel on Climate Change (IPCC) warns that a global increase of 2°C would expose an additional 420 million people to extreme heat, up to 270 million additional people to water scarcity and 350 million more people to nutrition risks, relative to limiting warming to 1.5°C above pre-industrial levels (IPCC, 2018). With current policies and actions, humanity is currently on track for 2.6–2.9°C of warming (Climate Action Tracker, 2022).

Limiting global warming to 1.5°C will require humanity to peak emissions before 2025, reduce emissions by 43% in 2030 compared to 2019 levels and ultimately achieve net-zero carbon emissions in the early 2050s (IPCC, 2022). Given that the energy sector currently contributes approximately three-quarters of greenhouse gas emissions, a transformation in how energy is produced, consumed and transported is therefore necessary to meet emissions reduction targets (IEA, 2021a). The International Energy Agency (IEA) finds that achieving net-zero energy by 2050 is incompatible with new oil, gas or coal projects anywhere in the world, but still sees fossil fuels accounting for over 20% of total energy supply in 2050 (IEA,

2021a). Other analyses that depend less heavily on carbon capture, utilisation and storage (CCUS) – technologies that are currently unproven and uneconomical on the scale needed for the IEA's scenarios – suggest that there is an urgent need for the rapid and complete phase-out of fossil fuel production, led by higher-income countries. Calverley and Anderson (2022) find that wealthier producer nations need to completely phase out oil and gas production by 2034, whereas middle-income and the poorest countries need to do so by 2043 and 2050, respectively.

While climate change is the primary reason for a global energy transition, many countries and communities see other compelling reasons to reduce their dependence on fossil fuels. On the *consumption* side, the inefficient burning of fossil fuels for power generation, industry and transport is strongly associated with toxic air pollution, one of the primary causes of premature morbidity all over the world (Vohra et al., 2021). Countries without substantial fossil fuel reserves have reason to be concerned about their energy security, as Russia's weaponisation of oil and gas has starkly demonstrated.

On the *production* side, many countries with large fossil fuel reserves suffer from the so-called 'resource curse', where large public rents generated without taxation of citizens are subject to potential elite capture, which can lead to weak institutions and governance (Bulte et al., 2005; Mehlum et al., 2006; Isham et al., 2005). There is ample evidence that such countries have higher levels of corruption and inequality if they did not already have robust democratic institutions upon discovery of the reserves (Bhattacharyya and Holder, 2010; Busse and Gröning, 2013;

Hartwell et al., 2019). The empirical evidence on the ‘resource curse’ is mixed on the causal links between natural resource abundance, weak institutions and poor development outcomes (Akacem et al., 2020), but the trends are clear. In oil- and gas-producing nations, the costs and benefits of the extractive industry are often borne unequally, with communities living around oil and gas fields suffering from severe environmental pollution and degradation, with commensurate impacts on their health and livelihoods.

Lastly, both producers and consumers suffer from extreme volatility in oil and gas prices. The fall in demand for oil products during the Covid-19 pandemic and the resulting collapse in prices caused considerable losses for oil and gas companies and had significant fiscal effects on resource-dependent oil-exporting countries (OECD, 2020). Meanwhile, energy supply shortages resulting from Russia’s invasion of Ukraine and the EU’s commitment to wean itself off Russian oil and gas (IEA, 2021b) have led to significant increases in energy prices and increased uncertainty about energy affordability and security in oil- and gas-importing countries (McKinsey and Company, 2022).

While the net benefits of a global energy transition may be clear, many countries, businesses and communities face net costs and losses associated with fossil fuel phase-out. In particular, low- and middle-income countries that are highly dependent on oil and gas exports are facing tremendous challenges – economically, politically and socially. These countries rely heavily on revenues from the sale of oil and gas to fund public services and infrastructure construction, as well as frequently to subsidise food, energy and other consumption. Therefore, reducing oil and gas production could have profound consequences for people’s living standards – both positive and negative – in these contexts (Calverley

and Anderson, 2022). In the aftermath of the Covid-19 pandemic and amidst ongoing food and energy price shocks, many low- and middle-income countries are still in precarious positions with incomplete economic recovery and high levels of debt (World Bank, 2022c). Specifically, 54 low- and middle-income countries currently face high levels of debt distress and, accordingly, fiscal constraints that prohibit them from either realising their national development priorities or working towards international climate goals. This is a notable increase from the 27 countries that experienced debt distress or at high risk of debt distress in 2015 (Chabert et al., 2022).

Many oil- and gas-dependent economies were already vulnerable to shocks and stresses (OECD, 2020). Many of these countries borrowed heavily to maintain public services and subsidise consumption during the Covid-19 pandemic and food price spike, even though public revenues had often fallen during this period; many are expected to continue borrowing given that high oil and gas prices have increased the value of their reserves and therefore their creditworthiness. Such countries will become even more dependent on export revenues to pay debts and maintain their creditworthiness. If the resources borrowed are not used prudently, these countries risk being locked into a cycle of indebtedness and fossil fuel dependency; indeed, many may have been locked into this cycle for some time. Such macroeconomic and fiscal conditions pose an immense challenge to securing a just energy transition, both within those countries and at a global scale. However, there has been limited analysis of the relationships between oil and gas production, borrowing and the implications for carbon lock-in.

This report explores the relationship between oil and gas dependence and a country’s debt burden,

where repayments are potentially reliant on fossil fuel revenues. In particular, it examines how a country's oil and gas dependency interacts with the level, composition and cost of government debt. By better understanding these links, it is possible to identify ways to break the cycle of reliance on oil and gas exports and increasing debt burdens, and to plan for the energy transition in line with climate goals in a timely and just manner.

It is important to recognise that debt is not inherently a problem. If governments borrow judiciously and use the resources for productive investments, they can expand their economy and generate cash flows so that they can repay the debt. Debt also allows governments to spread the costs of long-term investments over the generations that will enjoy the benefits, enhancing equity. Thus, borrowing is an essential fiscal tool. However, using debt to support consumption and building unsustainable levels of debt pose a major threat to both development and climate goals. High and growing debt service burdens mean that governments do not have enough fiscal space for other critical expenditures on health, education or social protection. Governments are also less able to make productive investments that would boost productivity and diversify economic activity, such as investments in power generation, transport systems and digital connectivity.

The debt crisis also poses a threat to the ability of countries to respond to the climate crisis. While low-carbon, climate-resilient development yields many benefits in terms of public health, food and energy security, resource efficiency and – of course – climate change mitigation and adaptation, these pathways typically have higher upfront costs and therefore higher financing needs (Mountford et al., 2018). High levels of indebtedness constrain a country's ability to

mobilise the resources necessary for climate-compatible development, thereby risking lock-in to pollution and maladaptation.

At this point, it is also important to acknowledge the profound injustices associated with climate change. Higher-income countries have typically achieved this status through burning fossil fuels and changing land systems, which has generated wealth but also released the greenhouse gases that cause climate change. In 2021, China, the United States, the EU27, India, Russia and Japan accounted for 62.4% of global GDP and 67.8% of global carbon emissions (Crippa et al., 2022). Many of these countries have historically been major polluters: the 20 largest cumulative emitters (1850–2021) include the United States (with 20.3% of the total global cumulative emissions), China (11.4%), Russia (6.9%), Germany, the UK, Japan and Canada (Evans, 2021). These countries can use their wealth to insulate themselves from the worst impacts of climate change, for example, through funding risk-reducing infrastructure and services. Meanwhile, lower-income countries typically have much lower per capita emissions: they bear much less responsibility for climate change, but will be more vulnerable to its impacts because they do not have the resources and capabilities necessary for adaptation. A handful of such countries might be on the list of the largest cumulative emitters, including Brazil, India and Indonesia, but this is a function of population rather than economic size.

This injustice plays out starkly with respect to the current debt and climate crises. Historical responsibility for climate change lies substantially with many of the high- and upper-middle income countries whose governments and financial institutions hold most of the public debt of low- and middle-income countries, notably China, Japan, the Netherlands, the United States, Germany, France, the UK, Russia, Austria and Saudi Arabia (Knoema,

2021). Private investors in OECD countries continue to own and benefit from most of the world's oil and gas production assets (Semieniuk et al., 2022). Despite these gross injustices, both the costs of runaway climate change and the inevitable energy transition in key export markets prevent low- and middle-income countries from pursuing business-as-usual development. It is therefore important to understand how indebted oil- and gas-dependent economies can navigate this process and secure a just transition at home.

The rest of the report is structured as follows. Section 2 examines the potential links between oil

and gas dependency and debt. Section 3 outlines the methodology for selecting countries and indicators, as well as the limitations of the data. Section 4 assesses the links outlined in Section 2 by examining trends and correlations between fossil fuel prices and various governance and fiscal variables between 2010 and 2020 for the 21 countries in our sample (unless otherwise stated). Section 5 discusses the possible options and mechanisms for addressing barriers related to high debt burdens that undermine countries' fossil fuel transition and offers recommendations for policy-makers in fossil fuel-rich countries, as well as international financing bodies and regulators.

## 2 Potential links between oil and gas dependency and debt

This section discusses the potential channels through which oil and gas dependency can contribute to the build-up of public debt and/or influence the cost of borrowing, thereby further increasing national reliance on the fossil fuel industry. The focus is on low- and middle-income countries, which are more likely to be trapped in commodity dependence (UNCTAD, 2021). Consequently, a key underlying assumption throughout this section is that many oil- and gas-dependent developing economies are not sufficiently diversified, and thus are unable to quickly find alternative sources of revenue to repay external government debt. This is a robust assumption given the extensive literature documenting that many resource-rich developing countries have not reinvested resource revenues to secure economic transformation and diversification<sup>3</sup> (van der Ploeg and Poelhekke, 2009; Stevens et al., 2015; UNCTAD, 2021). This in turn has potential repercussions for debt through various channels, as explained below. Evidence for these causal pathways is explored empirically in Section 4 and in the case studies in Appendix 1.

It is important to clarify that we do not test for *causality* to determine the specific factors driving indebtedness, which was beyond the scope of this study. However, we are examining the links between oil and gas dependency and

debt, reviewing trends in the data and drawing on relevant literature on resource governance, to draw conclusions on the relationship between oil and gas production and unsustainable levels of debt. While these are challenges facing many commodity exporters, climate change means that the risks associated with oil and gas production are particularly stark – both in terms of the physical impacts of higher average temperatures and the prospects of disappearing export markets leading to fiscal and macroeconomic instability.

### **There is a direct link between the control of oil and gas reserves and an entity's capacity to borrow.**

A key factor that prospective lenders typically use to assess the creditworthiness of a sovereign government, state-owned entity or private company that controls significant oil and gas reserves is the market price of oil and gas (S&P Global Ratings, n.d.). This is because the entity's ability to service debt is linked to the revenues it can generate from the sale of oil and gas, which are higher when prices rise and lower when they fall. However, commodity markets experience large and unpredictable price fluctuations, as explained in Box 1. The creditworthiness of oil- and gas-dependent countries accordingly rises and falls with resource prices.

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3 There are exceptions, with Costa Rica, Malaysia and Indonesia managing to break the so-called 'resource curse' and develop a strong manufacturing sector.

## Box 1 Commodity price ‘super-cycles’

Commodity prices are subject to ‘super-cycles’ where markets see price increases and decreases of large magnitude and over prolonged periods (Erten and Ocampo, 2012; World Bank, 2022c). They are a central policy issue for commodity-dependent developing countries as they act as fundamental disruptors of economic growth (Alberola-Ila et al., 2017; Fernández et al., 2020).

Recent decades have seen two such ‘super-cycles’ – from 2003 to the global financial crisis in 2008, and from 2010 to 2016. There has also been a surge in prices from 2021, in what some commentators see as the start of a new super-cycle. During these cycles, price changes are very material. For example, between 2003 and 2008 the real prices of energy and metals more than doubled, and between 2021 and 2022 the prices of crude oil and gas more than doubled in less than six months (Figure 1).

**Figure 1** Crude oil price index (1991–2022)



Data source: IMF Primary Commodity Price System

These cycles are typically driven by fundamental changes in global supply and demand. For example, the 2010–2016 cycle was driven by rapid industrial development and urbanisation in China, India and other emerging economies (Erten and Ocampo, 2012). The latest ‘cycle’ from 2021 is driven by rising demand at the end of the Covid-19 pandemic combined with reduced supply due to the war in Ukraine (World Bank, 2022c).

Some countries operate countercyclical policy responses – policies which counteract the general direction of the economy during a boom – in relation to commodity super-cycles, such as accumulating fiscal reserves or expanding sovereign wealth funds (which can, for example, provide financing for national infrastructure or private sector development). However, for developing countries, prudent long-term approaches can be superseded by other priorities such as short-term fiscal needs. The most recent cycle may encourage policy responses that would support a green transition, such as energy efficiency measures, investment in zero-carbon energy and promotion of more efficient production and consumption. However, policy has to date concentrated on trade restrictions, price controls and subsidies (World Bank, 2022c).

A minority of commercial banks and institutional investors use independent mechanisms to assess creditworthiness, but most depend on credit ratings developed by a handful of independent agencies using standardised methodologies, including assessments of prospective oil and gas revenues based on market prices. These credit ratings provide international investors with a rapid, standardised way to assess and price debt, and are particularly important for borrowing in international capital markets. Prospective lenders may also take into account the currencies used to purchase fossil fuels, and any mismatch to liabilities such as international borrowing in hard currencies (such as the US dollar, euro or Japanese yen). Fortunately, for oil- and gas-dependent countries, fossil fuels are typically purchased in US dollars (the ‘petrodollar’), the currency in which most international borrowing, including Eurobonds, is denominated (see, for example, Flandreau and Sussman, 2003; Eichengreen, 2002). The rise of resource-backed loans reinforces the link between fossil fuel reserves and borrowing capacity. Creditors seek collateral (assets pledged as security for repayment of a loan, to be forfeited in event of default) to help mitigate actual or perceived risks associated with the borrower or transaction (Mihalyi et al., 2020). Resource-rich countries can use their reserves or future streams of income from those reserves as collateral. There is growing evidence that expansions of lending to LICs by non-Paris Club creditors,<sup>4</sup> particularly China and private creditors, has been underpinned by resource-backed loans (e.g., Angola and Chad

(Mihalyi et al., 2020; Bräutigam and Gallagher, 2014). These loans have been heavily criticised as they are often hidden from public view and removed from government books (ibid.). Where these loans use a country’s oil and gas resources as collateral governments are unlikely to cut back on production; indeed, doing so may violate the terms of the debt contract.

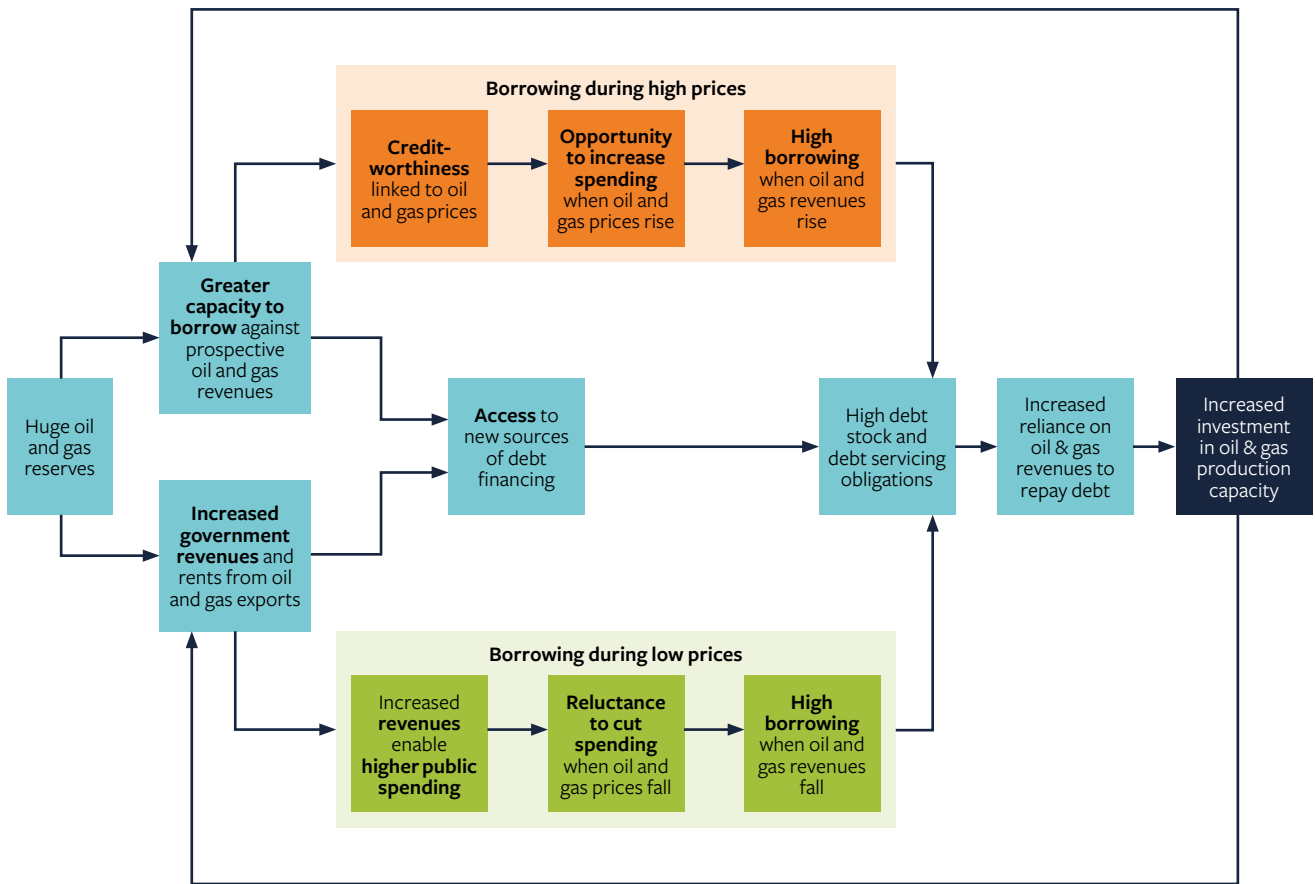
**The link between creditworthiness and oil and gas prices enables governments to borrow more during booms, such that increased revenues may lead to an increased debt burden rather than an improved fiscal position. Governments are reluctant to cut spending and investment during slumps, so they may borrow more to maintain expenditure.**

Governments in low- and middle-income countries that have abundant natural resources tend to have procyclical fiscal policies (Coulibaly and Kouame, 2019; Herrera et al., 2019; Bova et al., 2016). Instead of using windfalls to repay debt in ‘good times’, they tend to borrow more to expand spending and investment. When oil and gas prices and revenues fall, such programmes quickly become unsustainable. While some governments may engage in painful fiscal adjustments, such as large expenditure cuts, others may borrow more to fund spending that is too politically contentious to cut, thus adding to a country’s debt burden. As illustrated in Figure 2, oil- and gas-dependent economies frequently see rising levels of indebtedness both when prices are high and when they fall.

4 The Paris Club refers to a group of officials from major creditor countries whose role is to find coordinated and sustainable solutions to the payment difficulties experienced by debtor countries. The permanent members include Australia, Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Italy, Japan, South Korea, the Netherlands, Norway, Russia, Spain, Sweden, Switzerland, the UK and the US.



**Figure 2** How oil and gas production can lock nations into indebtedness and commodity dependency



Source: Authors

This procyclical bias in fiscal policy is stronger in economies with weak fiscal institutions (Herrera et al., 2019; IMF, 2011). Algeria, Nigeria and Venezuela, for example, have fallen prey to over-optimistic spending habits during fossil fuel booms, using current and expected profits to finance social or politically motivated projects (UNDP, 2015). In contrast, Chile and Norway demonstrate that prudent macroeconomic management, fiscal rules and fiscal stabilisation mechanisms (such as sovereign wealth funds) can be critical in avoiding painful adjustments when fossil fuel prices drop (Bova et al., 2016).

**Risks and loans associated with oil and gas production go beyond a government’s own balance sheets. State-owned enterprises and public and private financial institutions may also be highly exposed or indebted, with the risks transferred to government in a crisis.**

State participation in oil, gas and mining is often exercised through state-owned enterprises (SOEs), whereby governments take a direct ownership stake in oil, mineral or gas ventures, either as the sole commercial entity or in partnership with private companies (Manley and Heller, 2019).



While some SOEs are well-managed and profitable, others are not efficient or agile because they face less market discipline and weaker oversight than private companies (Heller and Mihalyi, 2019; Eller et al., 2011) – particularly those that are publicly listed. Their legal mandates may include expanding or maintaining fossil fuel production; their incentives may include meeting political agendas or maintaining sizable discretionary spending. Both may encourage SOEs to take on large amounts of debt. Despite an accelerating global energy transition, the capabilities, mandates and incentives of oil and gas SOEs can therefore lead them to borrow heavily to invest in ventures that may prove economically unviable, i.e. stranded assets. The government may ultimately be expected to repay such debts and liabilities, even when they are not formally guaranteed by the state (Manley and Heller, 2019).

The financial sector is also an important actor in oil and gas production, frequently providing loans that enable extraction and processing. However, lending to oil and gas companies typically follows and reinforces the economic cycle, just like spending and investment by resource-rich governments. The lending of private banks and institutional investors to the oil and gas sector expands when prices increase and contracts when prices decrease. This is a function of the way that oil- and gas-dependent countries' and companies' creditworthiness responds to price changes, but also of rising demand to finance expanded production and speculative exploration during periods of high oil and gas prices (Domanski et al., 2015). Such 'boom and bust' credit cycles mean that volatility in oil and gas markets is transmitted to the broader economy. In down cycles, bad debts accumulate, leading banks to reduce lending to all sectors. This can constrain investment by private firms and demand from households, with damaging long-term effects on economic

growth and diversification (Domanski et al., 2015; Christensen, 2016). Governments may also need to provide fiscal support to households and firms during such downturns, increasing spending even as oil and gas revenues fall.

**The links between oil and gas dependency and rising indebtedness can begin to form even before production has begun: the so-called 'presource curse'.**

The 'presource curse' arises when the promise of imminent resource riches leads government borrowing to balloon upon the discovery of new reserves but before production actually starts (Cust and Mihalyi, 2017; Ruzzante and Sobrinho, 2022). The discovery leads the government to increase its expenditure and investment on the assumption that, once production comes on stream, savings and current accounts will turn positive and thus allow the government to pay off the accumulated debt. In the interim, that government runs trade and current account deficits and borrows abroad (Arezki et al., 2017). However, overly optimistic projections about the costs and levels of production coupled with distorted political incentives (i.e. politicians may want to buy electoral support in order to remain in power) mean that revenues may not be sufficient to restore public finances. Thus, oil and gas discoveries can stimulate permanently higher government debt and increase the risk of debt distress, especially in countries with weaker political institutions and governance (Ruzzante and Sobrinho, 2022).

Much of the evidence for the presource curse predates the rapid improvements in the cost competitiveness of clean energy alternatives and national commitments to reach net-zero by mid-century. The scenarios that inform oil- and gas-rich governments' fiscal choices are

therefore even more likely to overestimate long-term oil and gas revenues than in past decades (Xiao et al., 2021). Recent oil and gas discoveries, for example, in Algeria, Brazil, Egypt, Guyana, Malaysia, Namibia and Senegal, are therefore

more likely to fuel indebtedness than comparable discoveries in the past, given that the clean energy transition is decreasing global demand, but not checking producer governments' spending and investment aspirations.

### 3 Methodology

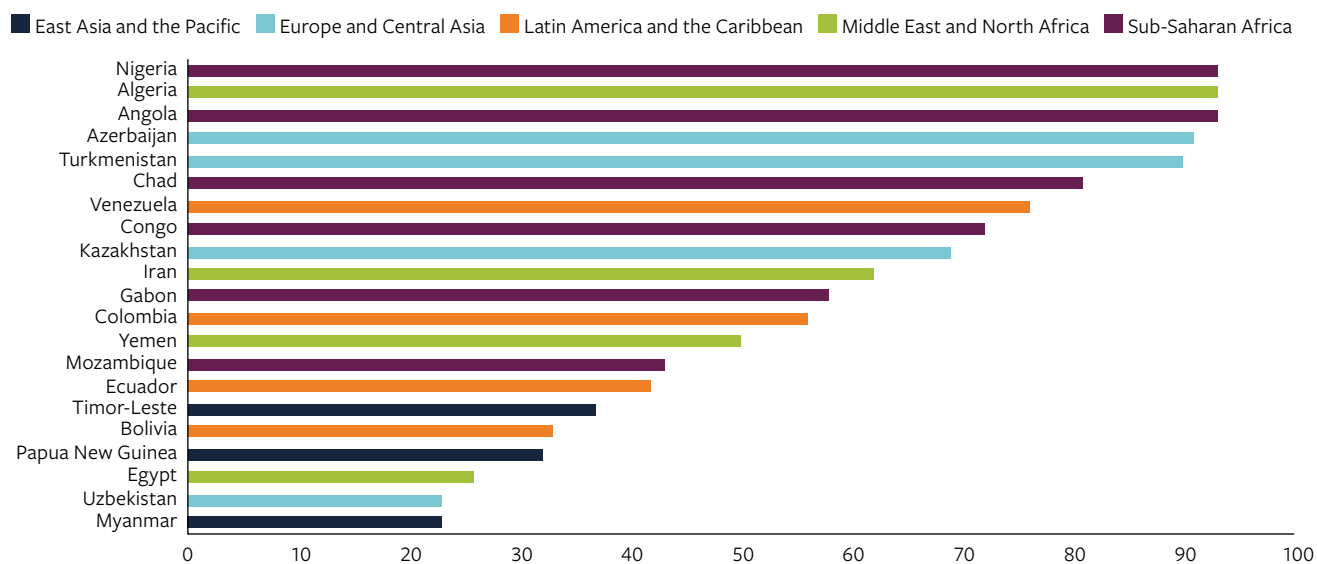
For the purpose of this report, fossil fuel-dependent countries are defined as countries with economies heavily reliant on the revenues generated from the production and export of fossil fuels. Given the lack of definitive and comparable data on the total oil and gas revenues of governments around the world, we use three indicators as proxies to identify fossil fuel-dependent countries:

- fossil fuel exports as a share of merchandise exports;
- oil rents as a percentage of GDP; and
- natural gas rents as a percentage of GDP.

For each indicator, we list the top 24 developing and transition countries, as shown in Table A2.1 in

Appendix 2.<sup>5</sup> Some countries appeared in the top 24 of multiple indicators, resulting in a combined list of 35 countries, as shown in Table A2.2 in Appendix 2. Since a major focus of this paper is on the link between fossil fuel dependency and debt, we further reduced the list of 35 countries based on the availability of data for debt stock, debt service and other key fiscal indicators. Due to data limitations for some countries, 21 countries, consisting of both developing countries and countries with economies in transition, were shortlisted to be used in this study. Figure 3 shows the shortlisted countries and their fossil fuel exports as a share of merchandise exports. Further details on the shortlisted countries, such as their income classifications, are provided in Table A2.3 in Appendix 2.

**Figure 3** Fuel exports of selected countries as a share of merchandise exports, 2018/2019



Data source: UNCTAD State of Commodity Dependence, 2021; UNCTADStat

5 The United Nations Department of Economic and Social Affairs (UNDESA) World Economic Situation and Prospects (WESP) classifies all countries into three broad groupings: developed economies, economies in transition and developing economies, which reflects basic economic country conditions.

Multiple indicators were used to ensure that the sample included countries with different forms of fossil fuel dependency. The resulting list is largely consistent with related studies looking at fossil fuel exporters at risk of stranded assets (e.g. Calverley and Anderson, 2022; Coffin et al., 2021; Fitch Ratings, 2021). However, the necessary exclusion of countries for which data is unavailable may mean that the remaining sample is not fully representative. The links discussed in Section 2 are assessed by examining trends and correlations using available data for the 21 countries. It is important to note that, for the purpose of this report, we do not test for causality as this requires an empirical strategy that is beyond the scope of this study.

To empirically examine the theoretical links outlined in Section 2, we use data to represent the potential channels through which oil and gas dependency can contribute to an increase in public debt.

We focus on the following sets of variables to examine trends in the data as follows:

- **Quality of governance and institutions** using the Resource Governance Index (RGI), which measures the quality of governance in the oil and gas sectors in 2017. Although the RGI was updated in 2021, only three countries in our sample were included in the update. The RGI composite score covers a large number of issues, from the allocation of extraction rights to the management of the revenue generated by oil and gas. We use graphs to examine trends in the data, in order to determine whether the governance of the oil and gas sectors is a challenge for our sample of oil- and gas-dependent countries.
- **Macro-fiscal indicators** from the IMF World Economic Outlook, specifically government revenue and expenditure, and government debt as a percentage of GDP. We examine the links between key indicators and energy prices. For energy prices, we use the IMF Primary Commodity Price System's energy price index (which includes crude oil, natural gas, coal price and propane indices) as our proxy for oil and gas prices. This is highly correlated with the spot crude price index (which is a simple average of the Brent, West Texas Intermediate and the Dubai Fateh spot prices). This allows us to investigate whether countries in our sample borrow both during times of high and low energy prices, and if there is rising indebtedness throughout.
- **Creditor composition of external government debt stock and service** in terms of bilateral, multilateral and private creditors from the World Bank's International Debt Statistics. Comparable data is unavailable for domestic debt. The data on total external debt service is contrasted with countries' ability to obtain foreign exchange through exports of goods and services. We examine trends in graphs to highlight how the composition changes over time.
- **Debt service on external debt** from the World Bank's International Debt Statistics. The theory suggests that the ability to service debts is linked to oil and gas revenues, which are higher when prices rise and lower when they fall. By using data on debt service payments, oil and gas rents and energy prices, we investigate this relationship.
- **Access and cost of international private finance** as indicated by credit ratings and international sovereign bond issuances.

## 4 Findings

### 4.1 Quality of governance and institutions

Our data confirms that effective governance of the oil and gas sectors is a persistent challenge, especially for low- and middle-income countries. Except Colombia, for which the overall quality of resource governance was scored as ‘satisfactory’ in 2017 (sixth in a sample of 55 countries<sup>6</sup>) and improved to ‘good’ in 2021 (third in a sample of 13 countries<sup>7</sup>), resource governance in the remaining countries in our sample was assessed as ‘weak’, ‘poor’ or ‘failing’ by Natural Resources Governance Institute (NRGI). For the three countries from our sample included in the 2021 update, all their scores improved out of a total score of 100: Colombia went from 71 to 76, Azerbaijan from 47 to 56 and Nigeria from 42 to 53. The reasons behind these improvements were the following:

- In **Colombia**, progress was made in the management of local impacts (driven by improvements in regulations on environmental impact assessments and mitigation plans) and the award of licences (NRGI, 2021a). Colombia also performs well on transparency in royalties administration. Nonetheless, there is room for improvement in terms of the disclosure of information from state-owned enterprises.
- **Azerbaijan**’s score rose due to the adoption of fiscal rules and improvements in the legal framework of the State Oil Fund of the Republic of Azerbaijan (SOFAZ), the country’s sovereign wealth fund (NRGI, 2021b). However, the governance of licencing and local impacts remains weak.

- **Nigeria** improved due to the inclusion in the assessment, for the first time, of the Nigerian Sovereign Investment Authority (NSIA), which manages Nigeria’s sovereign wealth fund. NSIA has strong rules and disclosures governing the fund (NRGI, 2021c). In addition, the state-owned Nigeria National Petroleum Corporation (NNPC) began to disclose more detailed information on fossil fuel sales. Nonetheless, significant governance challenges hamper improvements in other critical areas. Of particular concern is the lack of disclosure of public officials’ financial interests in extractive companies and the limited disclosure of significant beneficial ownership information.

At a more granular level, the weak fiscal governance of resource revenues in our sample is confirmed when we look at the revenue management subcomponent of the NRGI composite score. This subcomponent covers national budgeting, subnational resource revenue sharing and sovereign wealth funds. Of the 55 countries scored in 2017, Colombia had the highest score, 85 out of 100. The remaining countries in our sample scored below 60. Notably, despite being an upper-middle income country, Turkmenistan has the lowest score in both NRGI indicators (composite and revenue management). Although its 2008 Law on Hydrocarbon Resources contains some basic fiscal rules, the government fails to disclose information on how these will be met. Additional shortcomings in 2017 include the tax authority not being audited, and data on government finances and oil and gas revenue collection being unavailable. The 2017 assessment

6 The top five were Norway, the UK, Canada, the US and Brazil.

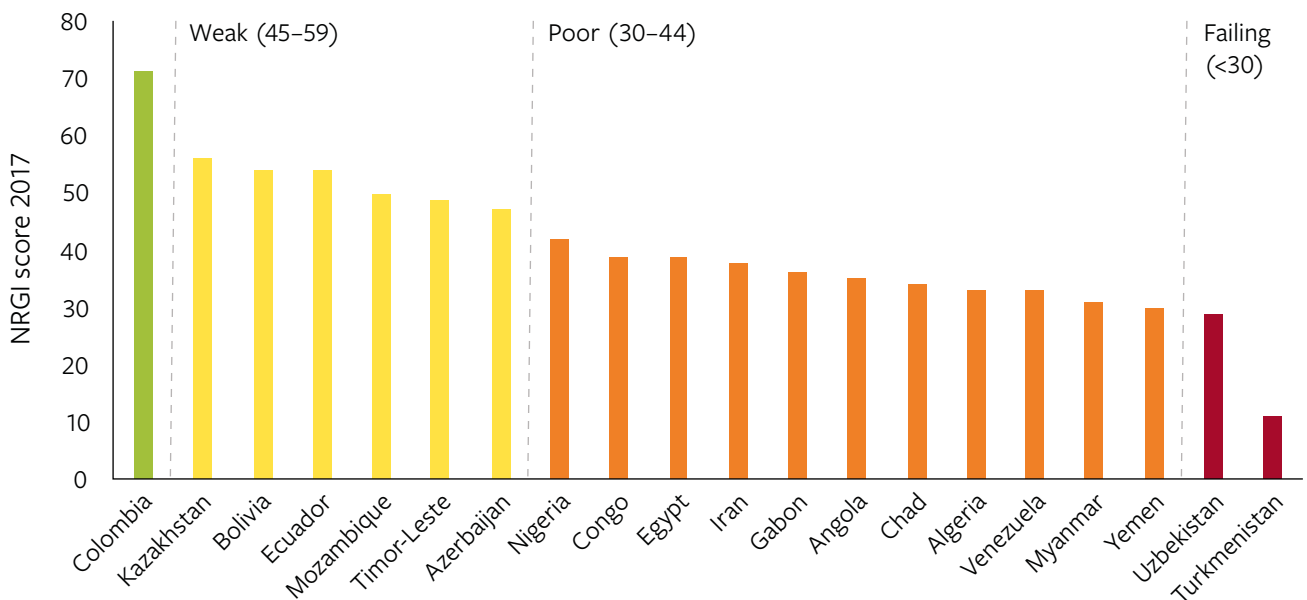
7 The top two were Senegal and Ghana.

also highlighted the weak governance of the state-owned gas company, Turkmengas State Concern, in terms of financial reporting and transparency around government transfers, production and fossil fuel sales.

The experience of Mozambique highlights the devastating economic, political and social consequences of a weak framework for managing resource wealth and weak transparency and accountability more broadly. Following the discovery of large reserves of natural gas in the mid-2000s, the government borrowed large amounts<sup>8</sup> against future revenues (its public debt roughly tripled) despite significant uncertainty regarding the timing and size of revenues (NRGI, 2017; Ruzzante and Sobrinho, 2022). In 2016 it

emerged that loans to three SOEs from three major international banks (Credit Suisse, VTB and BNP Paribas) had been guaranteed by the government without parliamentary approval in 2013 and 2014, equivalent to around 12% of GDP. Some \$1.3 billion of this was undisclosed until the international media reported it in 2016. These loans breached IMF and World Bank policies and resulted in the suspension of budget support by both institutions and other development partners. Following the scandal, Mozambique entered a protracted economic downturn and its external debt risk rating was downgraded to ‘in debt distress’. The government is currently implementing measures to address the debt problem and pave the way for more prudent management of natural resources in the future.

**Figure 4** Resource Governance Index country scores (composite), 2017

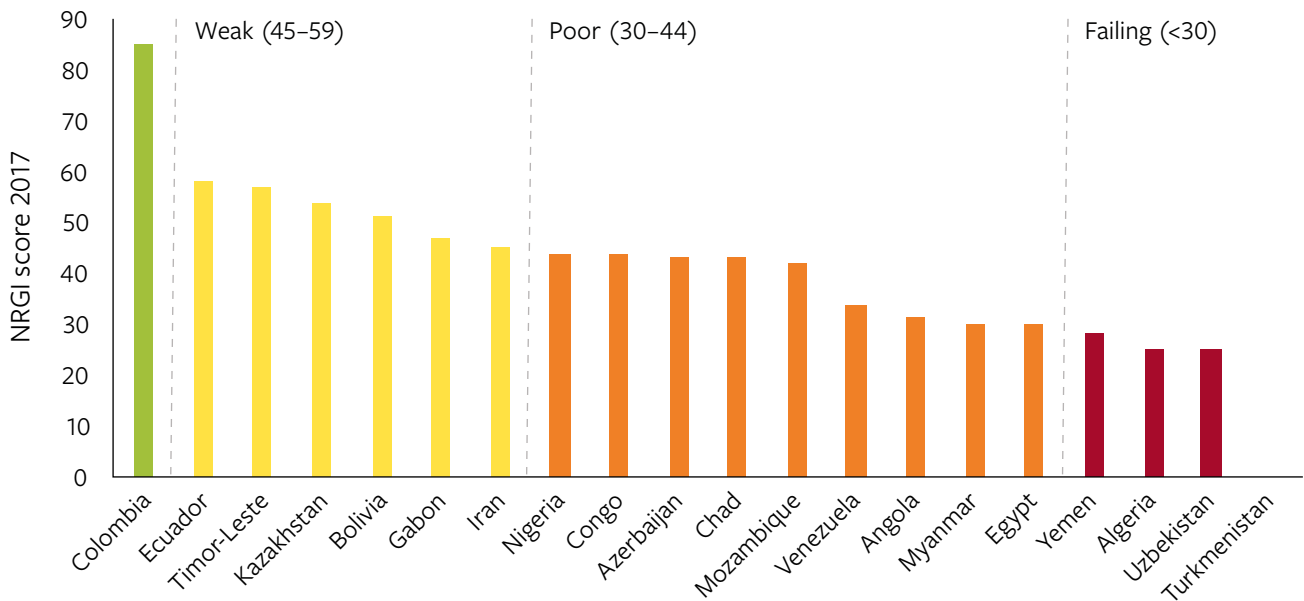


Data source: Natural Resource Governance Institute

Note: Excludes Papua New Guinea from our sample of 21 countries (due to lack of data).

<sup>8</sup> Mozambique’s debt build-up was also driven by other factors, including depreciation of the Metical, natural disasters and efforts to address insecurity.

**Figure 5** Resource Governance Index country scores (revenue management), 2017



Data source: Natural Resource Governance Institute

Note: Excludes Papua New Guinea from our sample of 21 countries. Turkmenistan’s score is ‘o’.

## 4.2 Fiscal performance

Oil and gas prices and fiscal outcomes are strongly correlated, especially during price downturns (as shown in Figures 6, 7 and 8). During the oil and gas price boom at the start of the sample period in 2010, revenue and expenditure were relatively high as a share of GDP. Government expenditure ratios increased by 8 percentage points or more between 2010 and 2014 in Republic of Congo (26 percentage points), Mozambique (13 percentage points), Bolivia (12 percentage points), Myanmar (10 percentage points), Papua New Guinea (9 percentage points) and Ecuador (8 percentage points).

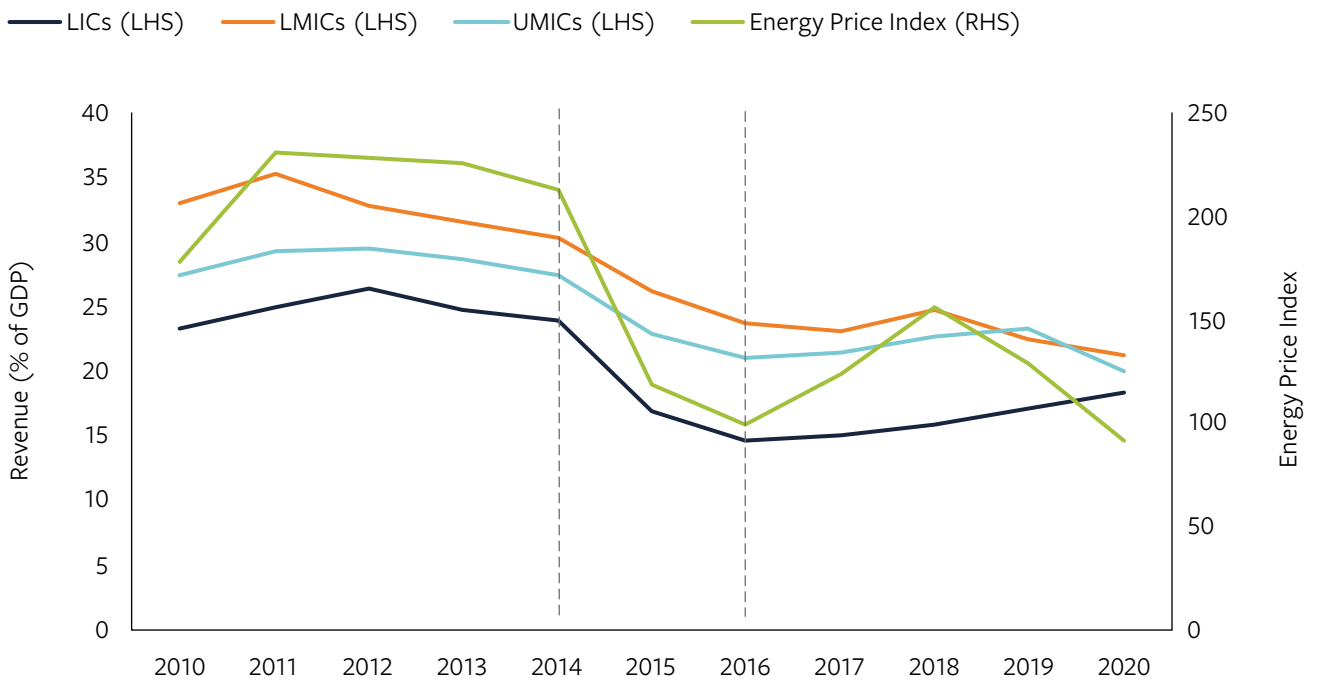
When prices fell between 2014 and 2016, public expenditure was cut in most countries in the sample<sup>9</sup> as a result of reduced fossil fuel revenues. Revenue decreased by more than 8 percentage points in six countries: Timor-Leste (-17 percentage points), Yemen (-16 percentage points), Angola (-13 percentage points), Gabon (-13 percentage points), Republic of Congo (-12 percentage points) and Venezuela (-11 percentage points). On the expenditure side, cuts exceeded 8 percentage points in five countries in the sample: Angola (-14 percentage points), Venezuela (-12 percentage points), Yemen (-12 percentage points), Mozambique (-11 percentage points) and Chad (-8 percentage points).

<sup>9</sup> The exceptions are Algeria, Iran, Timor-Leste and Kazakhstan.

Among these five, Venezuela is the only upper-middle income country. In the remaining six sample UMICs the decline was more modest, with an average of 1.3 percentage points. The more recent decline in fossil fuel prices between 2018 and 2020 did not result in expenditure cuts, though this is likely because governments had to respond to the Covid-19 pandemic. In fact, expenditure (as a share of GDP and also in absolute terms) increased in most countries

during this period. Expenditure cuts during periods of low fossil fuel prices were rarely as large as the revenue decline, leading to higher fiscal deficits despite various fiscal rules (see Box 2). In fact, expenditure was only cut by more than revenue declined in four of the 21 countries – Angola, Venezuela, Mozambique and Chad (see Figure A4.1 in Appendix 4, which shows the changes in revenue and expenditure between 2014 and 2016).

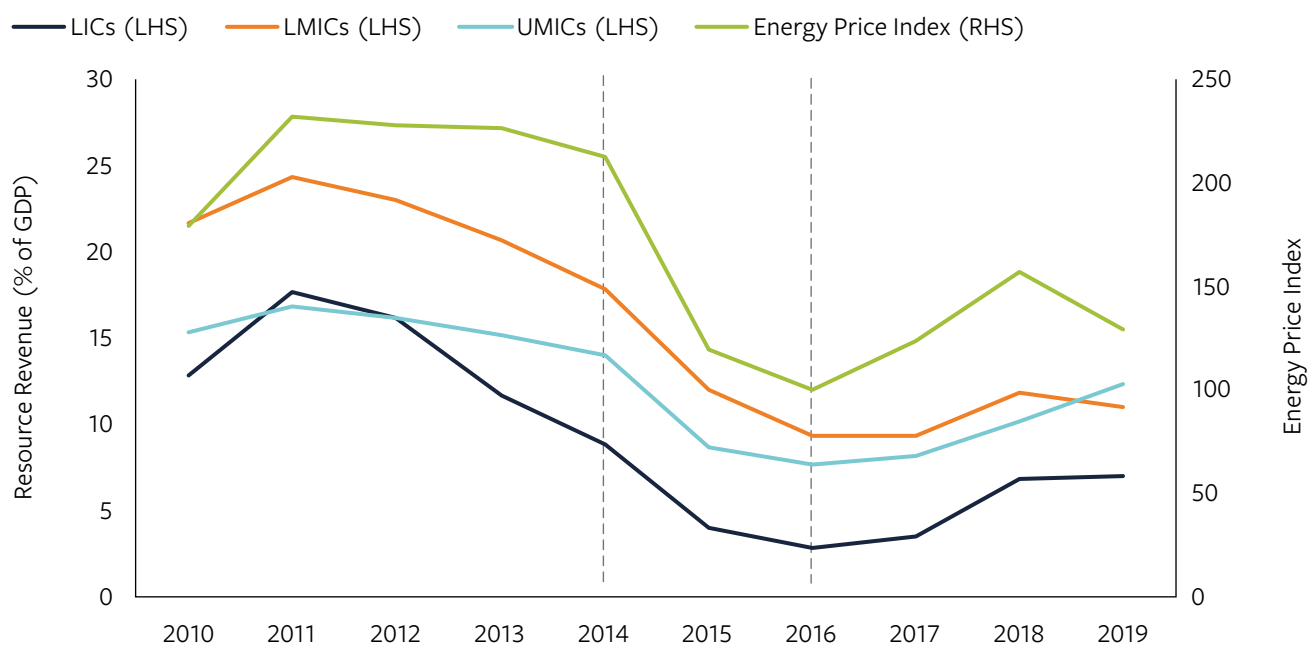
**Figure 6** Government revenue (% of GDP), 2010–2020



Data source: IMF World Economic Outlook, IMF Primary Commodity Price System



**Figure 7** Resource revenue (% of GDP), 2010–2019

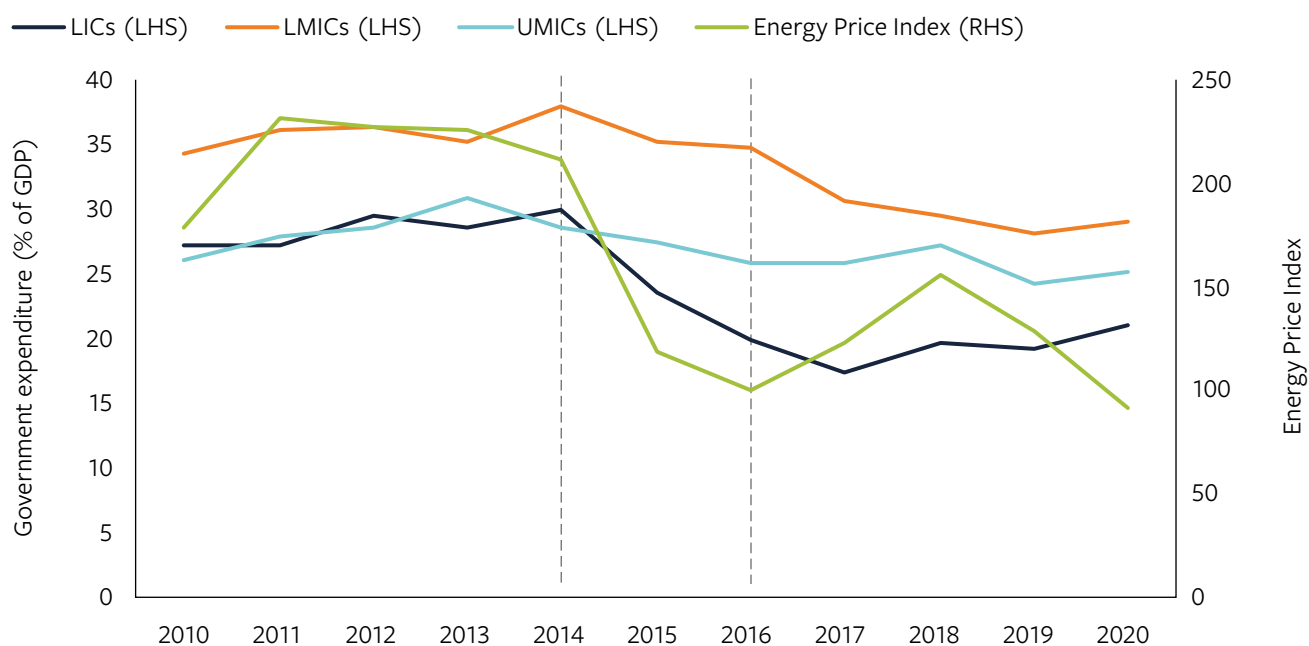


Data source: UNU-WIDER Government Revenue Dataset (GRD); IMF Primary Commodity Price System

Notes:

1. Excludes Ecuador, Iran, Mozambique, Myanmar, Turkmenistan, Uzbekistan, Venezuela and Yemen due to lack of data.
2. Data for Azerbaijan 2016 sourced from Republic of Azerbaijan: 2016 Article IV Consultation; data for Bolivia 2018 sourced from Bolivia 2021 Article IV Consultation; data for Chad 2018–2019 sourced from Chad: Staff Report for the 2019 Article IV Consultation; data for Kazakhstan 2019 sourced from Republic of Kazakhstan: 2021 Article IV Consultation.

**Figure 8** Government expenditure (% of GDP), 2010–2020



Source: IMF World Economic Outlook; IMF Primary Commodity Price System

Many countries suspended their fiscal rules during the pandemic to provide support to households and firms (Davoodi et al., 2022). The widespread activation of escape clauses showed that rules do not have to be rigid and countries have the flexibility to respond to large shocks within a well-defined framework. A key policy

challenge is whether and how countries should develop a transition path to reinstate the fiscal rules. For example, Colombia has announced a new framework for a gradual return to the fiscal rule limits, after the country suspended the rules temporarily during the pandemic.

## Box 2 Fiscal rules during the fossil fuel price shock

Following the 2014 decline in fossil fuel prices, 2015 and 2016 were characterised by severe budgetary challenges in many oil- and gas-dependent countries. To counteract the impact of volatile energy prices, several countries in our sample introduced fiscal rules or established resource funds. However, with the exception of Colombia, which adopted a fiscal rule in 2011 and followed it during the fossil fuel price shock, deviations have been frequent and persistent (Caselli et al., 2022):

- **Rule compliance:** Colombia adopted a fiscal rule in 2011 and followed it during the fossil fuel price shock.
- **Rule suspended:** Venezuela's fiscal rule has been modified 17 times since its adoption in 2000 with negligible public awareness of those changes and little compliance. In practice, fiscal rules are no longer being implemented.
- **Failure to comply:** Republic of Congo breached its debt limit in 2015 and defaulted on its debt the following year. It remains in debt distress, which means it cannot repay its creditors on the agreed terms and timeframes.
- **Rule modified:** Ecuador amended the public debt calculation in 2016 to use consolidated rather than aggregate debt figures, leading to a substantial drop in reported debt and providing additional space for public borrowing within the fiscal rule limits. Previously, public debt was close to the fiscal rule limit (40% of GDP).

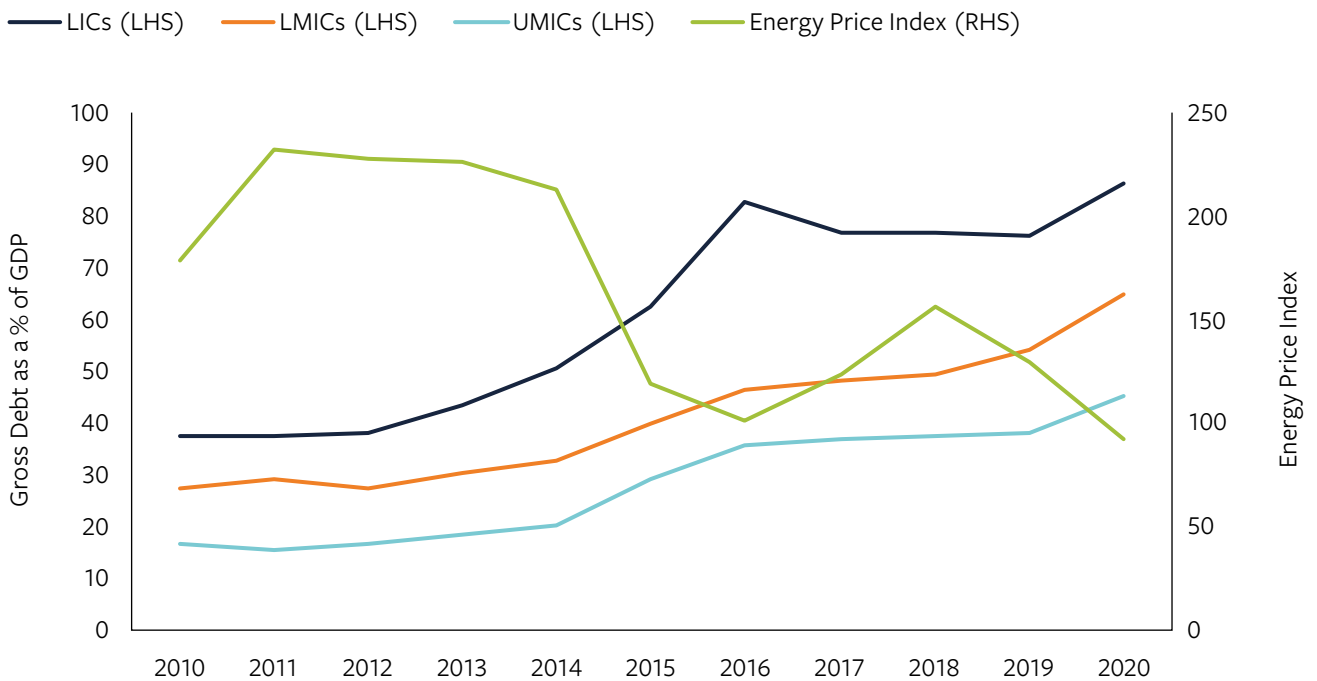
Source: Adapted from Mihalyi and Fernandez (2018)

Higher fiscal deficits have been financed mainly by taking on further debt obligations. As shown in Figure 9, gross government debt relative to GDP was on an upward trend for most of the period 2010–2020, especially after the dramatic fall in fossil fuel prices in 2014 and was facilitated by historically low global interest rates (discussed below). Although it is beyond the scope of this paper to provide an in-depth analysis of public debt dynamics, all 21 countries in our sample experienced a surge in debt ratios following the decline in oil prices in 2014 and the deterioration of their public finances.

However, there is a significant variation in the magnitude of this increased debt ratio between 2014 and 2016 among the 21 countries, as follows:

- 30 percentage points or higher for six countries: Angola, Republic of Congo, Gabon, Iran, Mozambique and Venezuela;
- between 20 and 30 percentage points for one country: Yemen;
- between 10 and 20 percentage points for four countries: Algeria, Azerbaijan, Chad and Ecuador; and
- less than 10 percentage points in the remaining 10 countries: Bolivia, Colombia, Egypt, Kazakhstan, Myanmar, Nigeria, Papua New Guinea, Timor-Leste, Turkmenistan and Uzbekistan.

**Figure 9** General government gross debt as a percentage of GDP and energy price index (2010–2020)



Data source: IMF World Economic Outlook; IMF Primary Commodity Price System

Note: UMICs average excludes Venezuela as an outlier.

**Figure 10** Government revenue, expenditure and gross debt as a percentage of GDP (all fossil-fuel dependent countries in sample), 2010–2020

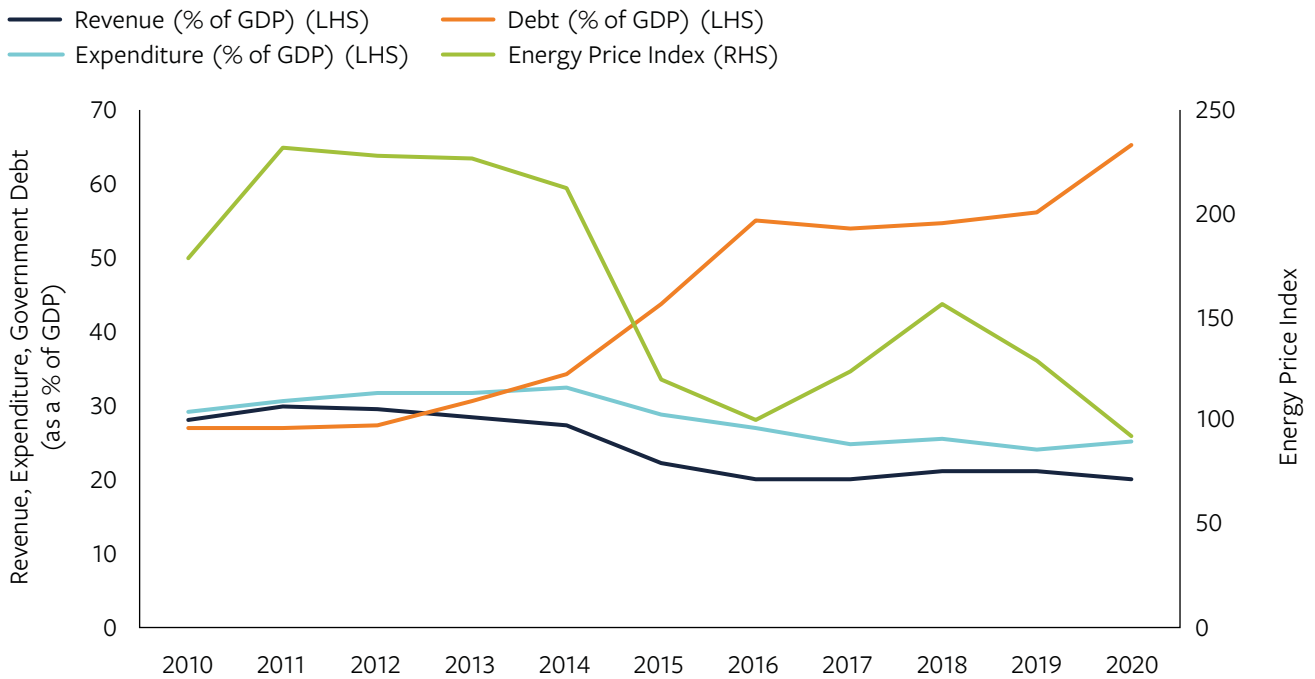


Figure 10 shows the relationship between all fiscal variables using an average for all countries in the sample. It shows that, when oil prices fell during 2014–2016, both revenue and expenditure began to decrease. At the start of the period, revenue and expenditure were almost equal, suggesting that countries had enough revenue to cover expenditure. However, during 2014–2016, revenue began to fall more than expenditure was being cut. At this point, debt burdens increased significantly to finance fiscal deficits.

The results of this section suggest that the public finances of low- and middle-income countries that depend on oil and gas revenues are extremely vulnerable to energy price shocks, which in turn

has contributed to higher debt burdens and a narrowing gap between countries' oil and gas rents and their debt service payments. A less pronounced surge in public debt levels was also experienced in countries that are not dependent on oil and gas revenues. In sub-Saharan Africa, for example, public debt levels increased in resource-poor and resource-rich countries between 2012 and 2018, but the increase in public debt was more pronounced in oil-dependent countries (Calderón and Zeufack, 2020). Excluding Nigeria, the public debt level of oil-rich countries in sub-Saharan Africa increased by more than 40 percentage points, while the pace of public debt increase was slower for resource-poor countries (18 percentage points of GDP) (ibid.).

### 4.3 Creditor composition of external debt

This section examines the creditor composition of external government debt<sup>10</sup> between 2010 and 2020 for 20 countries in our sample.<sup>11</sup> It considers the following five types or sources of debt:

- **Bilateral debt** includes loans from foreign governments and their agencies, loans from autonomous state-owned bodies and direct loans from official export credit agencies. Bilateral debt is disaggregated into two components: concessional and non-concessional. Concessional debt is extended on terms substantially more generous than the latter, with a grant element of 35% or more.
- **Multilateral debt** includes loans and credits from the World Bank, regional development banks and other multilateral and intergovernmental agencies. This is again disaggregated into two components: concessional and non-concessional.
- **Bondholders** of international bond issuances that are either publicly issued or privately placed.
- **Commercial banks**, including loans from private banks and other private financial institutions.
- **Other private creditors**, including credits from manufacturers, exporters and other suppliers of goods, and bank credits covered by a guarantee of an export credit agency.

As shown in Figure 11, creditor composition changed significantly for our sample of countries between 2010 and 2020, with the composition of financing continuing to evolve towards new, more expensive sources for the reasons outlined

in Section 2. On average, the concessional share of external debt (bilateral and multilateral) declined between 2010 and 2020 (from 27% to 16%), while the relative share of more expensive debt grew. Perhaps the most striking increase is in the use of international bonds, which accounted for 22% of external public debt stock between 2018 and 2020, compared to 12% between 2010 and 2012. The share of bonds is negligible for LICs compared to higher-income groups, with only Mozambique making its first ever bond issuance in 2013. However, the share of debt from non-concessional official creditors (for Yemen<sup>12</sup>), as well as private sector creditors (for Chad) has increased significantly.

Some of the increase in the total external debt stock between 2010 and 2020 can be attributed to increased borrowing from bilateral and multilateral creditors. Uzbekistan (358%), Papua New Guinea (314%) and Nigeria (296%) had the largest percentage increases in debt stock from these sources (see Table A4.3 in Appendix 4). Four countries had percentage increases over 200%, six had a percentage increase between 100% and 200%, and three had an increase less than 100%. Iran, Algeria and Chad reduced their external debt from official creditors (by 85%, 28% and 16%, respectively).

In most of our focus countries, increased borrowing from these lenders was dwarfed by the percentage increase in external public debt from private creditors. Bolivia's debt from private creditors increased by 8,483%, followed by Chad, with an increase of 7,475%

10 Public and publicly guaranteed debt comprises long-term external obligations of public debtors, including the national government, public corporations, SOEs, development banks and other mixed enterprises, political subdivisions, autonomous public bodies and external obligations of private debtors that are guaranteed for repayment by a public entity.

11 Timor-Leste has been excluded because of missing data for some years.

12 According to the available data, the government of Yemen does not borrow from private sector creditors.

(see Table A4.3 in Appendix 4). Three countries had an increase of over 1,000%, and two over 500%. Only Iran and Algeria reduced their public debt from private creditors during this period. Egypt, Uzbekistan and Mozambique increased their private non-guaranteed debt by 648%, 595% and 553%, respectively. These examples from our sample highlight the shift to more expensive debt, although we note that this trend can be seen across many developing countries, whether or not they are dependent on oil and gas revenues (Cohen and Harnoys-Vannier, 2023).

Several governments and SOEs in our sample contracted resource-backed loans (RBLs) from non-traditional bilateral creditors (China) and private sector creditors (specifically commercial fossil fuel traders), as discussed in Section 2. Based on the available data, the countries with by far the largest amounts of RBLs in their respective regions are Venezuela (\$59 billion) and Angola (\$24 billion) between 2004 and 2016; other countries with a notably high volume of RBLs include Chad, Republic of Congo and Kazakhstan (Mihalyi et al., 2020).

Theoretically, RBLs can be advantageous under certain conditions.<sup>13</sup> In reality, they are prone to abuse and mismanagement since they are generally negotiated through highly opaque deals in countries with weak resource governance (Mihalyi et al., 2020). They can also undermine a country's

debt sustainability, in three ways: by making it easier to over-borrow; by impairing access to non-secured financing, particularly after bad shocks; and by complicating debt restructuring. To a large extent, this has been Chad's experience with RBLs, as described in Box 3.

Venezuela's loans are from China Development Bank (CDB) and the Russian state-owned oil company Rosneft. Venezuela's Economic and Social Development Bank (BANDES) and the national oil company, PDVSA, contracted most of these loans. These RBLs have played a major role in Venezuela's debt problems. Although Venezuela defaulted on some of its debt obligations in 2018, PDVSA has continued to service the oil-backed loans it took out from Russia and China. This is partly because RBLs are de facto more senior than other debt by virtue of their earmarked revenue stream, whereas other creditors must wait for some receipts to come into the treasury (Mihalyi et al., 2020). This means that RBL repayments supersede other loan commitments. Further incentives to repay are due to the threat of lenders seizing the assets provided as collateral if the government stops servicing the loan. In Angola, Chinese lenders provided more than \$24 billion of oil-backed loans and credit lines, mostly to the national oil company Sonangol (Mihalyi et al., 2020). Sonangol also independently borrowed large amounts from Chinese lenders.

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13 According to an IMF and World Bank study, collateralised finance is more likely to lead to beneficial outcomes if: (i) the transaction produces assets or revenue streams that can be used for repayment (as opposed to financing consumption or the general fiscal deficit); (ii) the reduced risk resulting from collateralization is reflected in improved financial terms; (iii) a rigorous debt sustainability assessment is passed; and (iv) there is full, public transparency on all contractual terms.

### Box 3 The pitfalls of resource-based loans: Chad's experience

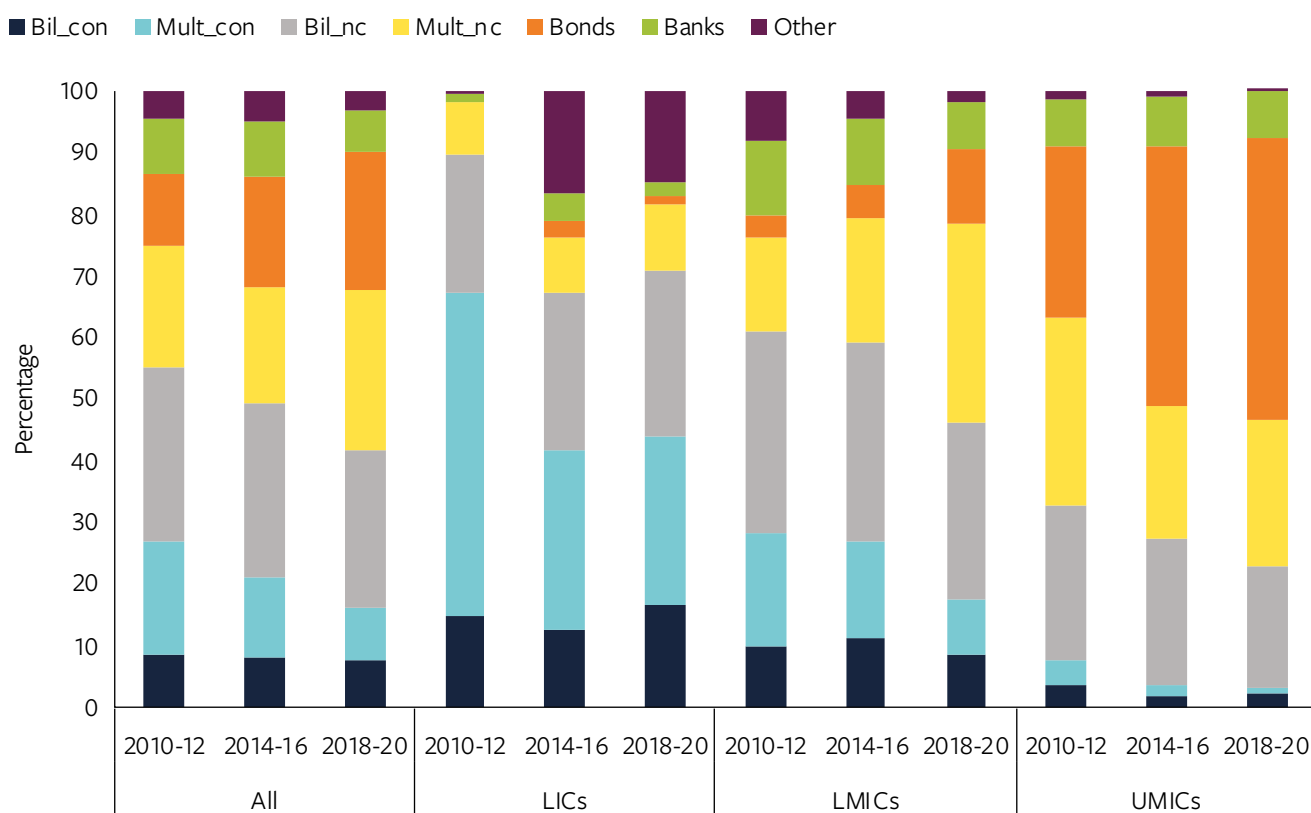
Chad, which became an oil producer in the early 2000s, was strongly impacted by the oil price shock in 2014–2015. Before the shock, Chad contracted oil-backed loans (collateralised debt) from an Anglo-Swiss trading company, Glencore Energy (around 10% of GDP) (IMF, 2021). These loans were used by the state-owned oil company Société des Hydrocarbures du Tchad (SHT) to purchase Chevron's share in the Doba consortium for \$1.36 billion, and to provide the government with budget financing of \$600 million.

The IMF has identified these large RBLs as a major contributor to Chad's external commercial debt problem (IMF, 2019a). The loans, which are partly syndicated<sup>14</sup> to many banks and funds, were originally to be repaid over the period 2014–2018 through direct deductions from oil shipments sold by Glencore. If the value of deductions from oil shipments turned out to be insufficient to service the debt, then the revenues from oil royalties due to the government would also be used.

Following the sharp decline in oil prices and revenue that began in mid-2014, the government reached a rescheduling agreement with Glencore in November 2015. However, at the end of 2016 debt service to Glencore absorbed between one-half and two-thirds of the value of total oil shipments (*ibid.*). In 2018, deeper debt restructuring was undertaken, leading the share of commercial debt, mostly owed to Glencore, to fall from a peak of 53% in 2016 to 37% in late 2020. Bilateral debt also doubled in the past decade, with China becoming the main bilateral creditor.

Chad is classified as being in debt distress by the IMF, and is one of the three countries that applied for debt relief under the G20 Common Framework for debt treatments beyond the Debt Service Suspension Initiative in January 2021. However, disputes with Glencore have hindered Chad's progress under the Common Framework. The Framework requires private sector creditors to provide debt relief on comparable terms to official bilateral creditors (Georgieva and Pazarbasioglu, 2021), but is unable to enforce this (Rivetti, 2022). Delays in completing restructuring create macroeconomic drag, which primarily hurts the borrower but also jeopardises returns to creditors. While current high oil prices may mean that Chad no longer requires immediate debt relief, its experience highlights the need for borrowers to understand the potential implications of the collateral they are using, and the options available for a resolution in the event of debt distress.

14 Syndication means that smaller lenders do not necessarily hold the debt themselves. For example, Deutsche Bank, Credit Agricole and ING partly financed Glencore's loan to Chad (Mihalyi, et al., 2020).

**Figure 11** Creditor composition of external debt stocks (PPG), 2010–2020

Data source: World Bank, International Debt Statistics

Note: ‘Bil\_con’ is bilateral concessional debt, ‘Multi-con’ is multilateral concessional debt, ‘Bil\_nc’ is bilateral non-concessional debt, ‘Multi\_nc’ is multilateral non-concessional debt, ‘Other’ refers to other private creditors.

#### 4.4 External debt servicing

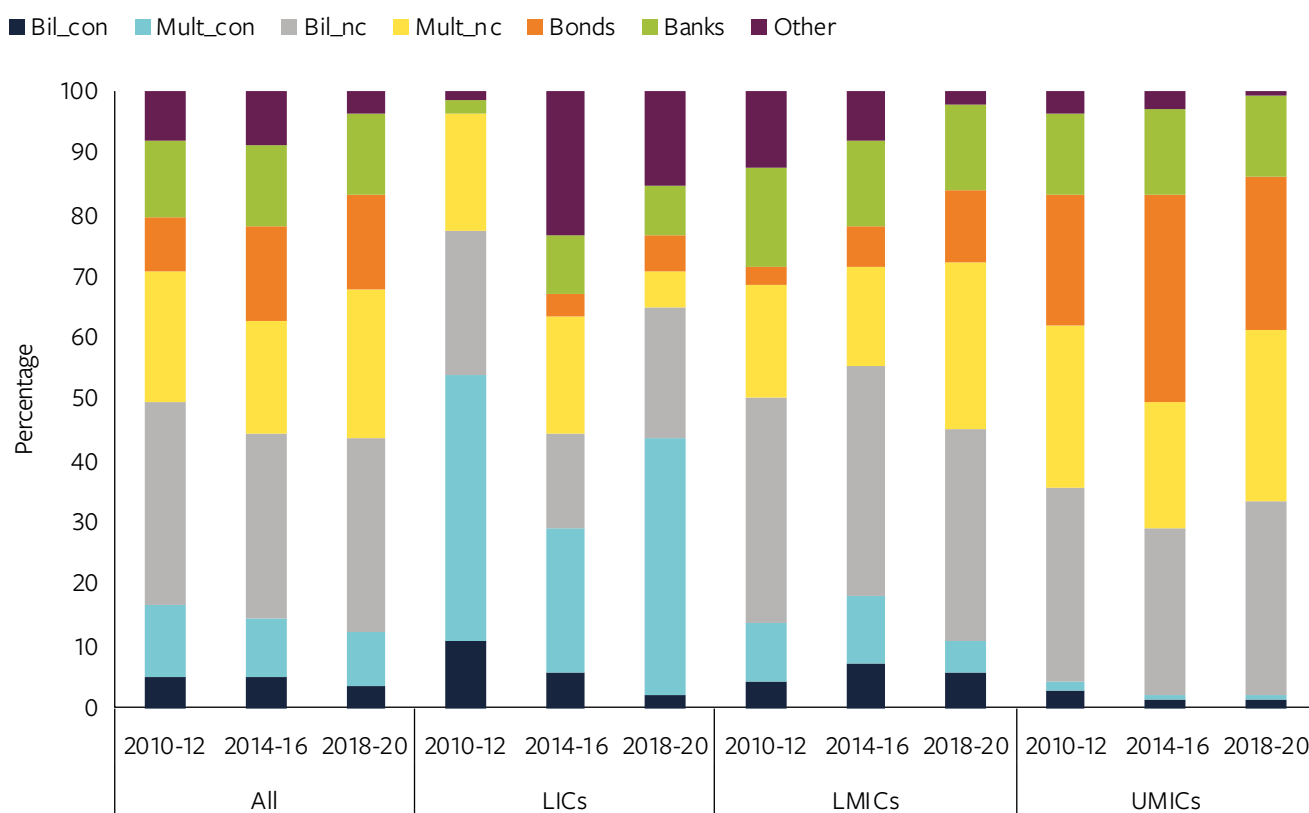
This section examines changes in external debt service payments between 2010 and 2020. The shift in creditor composition toward more expensive sources of financing is reflected in the breakdown of external debt service payments between 2010 and 2020, shown in Figure 12, and the dramatic increase in debt service as a share of exports, shown in Figure 13.

Since 2014, more than 50% of debt service payments have gone toward repaying non-concessional debt from bilateral, multilateral and

private sector creditors. This percentage is even higher for LMICs and UMICs, above 90% between 2018 and 2020. While multilateral concessional debt for LICs appears to account for roughly the same percentage of external debt service payments at the start and end of the period (around 40%), this is driven by Yemen, where almost 100% of debt service between 2018 and 2020 was on multilateral concessional debt. This is not surprising given the ongoing civil conflict that began in late 2014. In contrast, for Chad and Mozambique the bulk of debt service payments are now to bilateral non-concessional debt and private creditors.



**Figure 12** Creditor composition of external debt service (PPG), 2010–2020

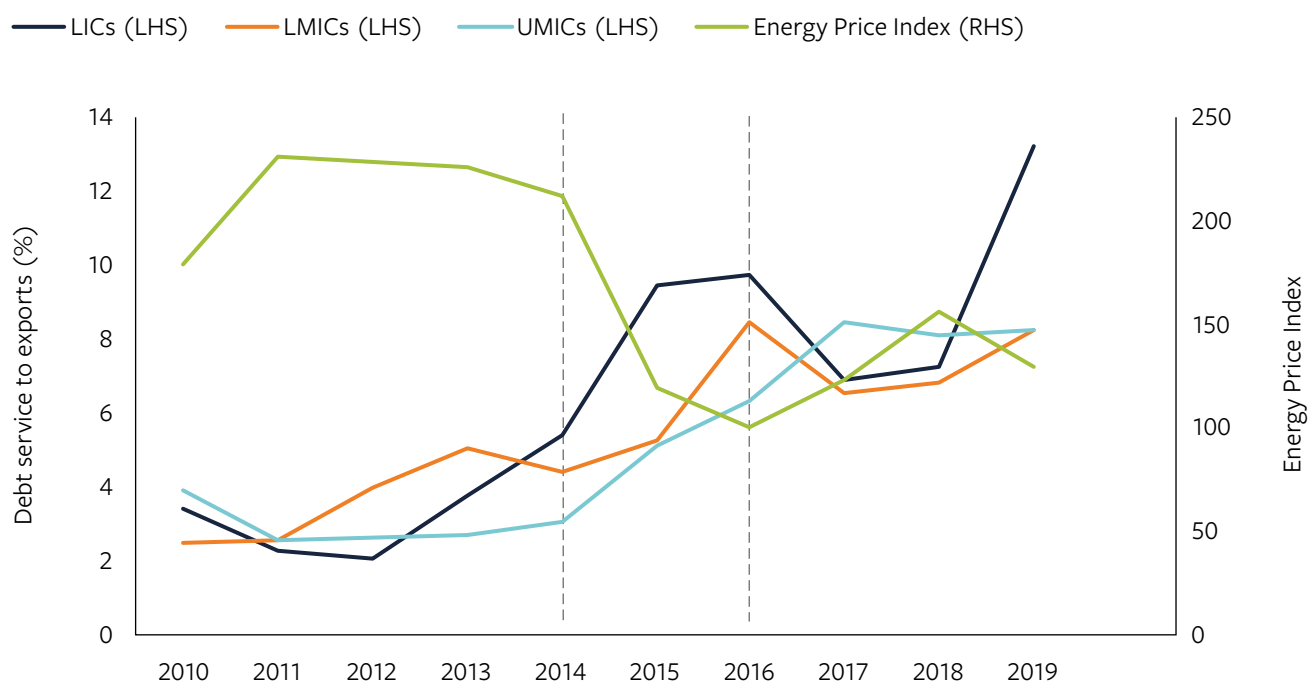


Data source: World Bank, International Debt Statistics

Note: ‘Bil\_con’ is bilateral concessional debt, ‘Multi-con’ is multilateral concessional debt, ‘Bil\_nc’ is bilateral non-concessional debt, ‘Multi\_nc’ is multilateral non-concessional debt, ‘Other’ refers to other private creditors.

Figure 13 shows external debt service as a share of export earnings and the energy price index. The UMICs in our sample have seen the share of export revenue going to debt servicing rise from 4% to 8%, partly because of a decline in revenues due to lower oil and gas prices. The trend is much more pronounced for Mozambique, the only low-

income country in our sample for which this data was available, where the share of export revenue going to debt servicing rose from 3% to 13%. The inverse relationship highlights that external debt service payments account for a smaller share of export revenues when fossil fuel prices are high, and a larger share when prices are low.

**Figure 13** Debt service (PPG and IMF only, percentage of exports of goods, services and primary income)

Data source: World Bank International Debt Statistics; IMF Primary Commodity Price System

Note: Excludes Chad, Congo, Gabon, Turkmenistan, Venezuela and Yemen due to lack of data. LIC average is only Mozambique.

When comparing 2010 and 2019, the gap between oil and gas rents and debt service payments decreased, or debt service payments exceeded oil and gas rents (see Table 1 and Tables A4.1 and A4.2 in Appendix 4). In the subset of 19 countries in our sample (the only ones for which data was available), the gap between oil and gas rents and debt servicing decreased between 2010 and 2019 for all except one (Myanmar). In four countries (Bolivia, Colombia, Ecuador and Mozambique), debt service levels exceeded oil and gas rents. In Kazakhstan and Papua New Guinea, where debt service levels already exceeded oil and gas rents in 2010, 2019 saw an even larger gap. The decrease in this gap was most marked between 2014 and

2015 – the period in which energy prices fell – in all countries except Myanmar and Papua New Guinea. While all countries' oil and gas rents exceeded their debt service payments in 2014, in 2015 debt service payments exceeded rents in four countries, Colombia, Ecuador, Kazakhstan and Mozambique, and this continued throughout the sample period.

The results of this section highlight that, as debt service payments rise, countries may be even less incentivised to cease fossil fuel production. Instead, fiscal imperatives demand that they expand oil and gas extraction to generate the revenues necessary to repay their loans and interest.

**Table 1** Difference between oil and gas rents, and debt service of external debt (2010–2020, US\$)

Difference between oil and gas rents and debt service on external debt (US\$ million)											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Algeria	41,180	60,895	61,256	57,226	50,776	25,208	18,482	23,643	31,879	27,627	16,885
Angola	29,560	40,693	38,899	34,871	23,845	456	-5,785	1,858	10,044	5,914	4,769
Azerbaijan	16,540	21,989	20,440	17,986	15,322	5,753	3,994	6,203	11,066	10,022	6,060
Bolivia	383	1,268	1,448	1,856	1,061	59	-73	-81	344	-113	-531
Chad	2,177	3,051	2,682	2,279	1,836	711	520	1,294	2,199	1,924	1,100
Colombia	3,261	12,981	8,042	13,718	5,652	-5,860	-10,424	-13,751	-10,914	-6,882	-14,329
Congo, Rep.	5,742	8,272	7,448	5,652	4,839	1,293	1,095	2,803	5,486	4,873	2,740
Ecuador	6,109	9,972	9,496	8,816	7,296	-761	-2,156	-1,425	-1,419	-2,230	-4,921
Egypt	15,663	24,025	25,238	24,001	18,153	8,813	2,359	4,927	8,275	5,595	-4,417
Gabon	3,838	6,032	5,497	4,010	3,774	994	966	1,826	2,711	2,757	789
Iran	105,616	167,365	145,278	130,290	122,752	62,320	58,699	84,789	116,389	72,651	49,070
Kazakhstan	-13,054	7,819	15,714	5,942	1,247	-20,660	-9,300	-9,408	-2,699	-5,276	-13,127
Mozambique	142	113	395	202	114	-505	-883	-998	-1,280	-1,505	-816
Myanmar	-235	-205	-302	-902	1,394	1,806	687	928	1,816	1,444	908
Nigeria	49,001	74,319	70,406	60,626	49,867	17,585	10,868	22,483	38,189	32,397	16,854
Papua New Guinea	-233	-350	272	-487	401	561	-2,087	-1,291	-657	-538	37
Turkmenistan	6,673	12,548	13,298	12,545	9,311	4,973	2,744	4,549	7,964	5,746	-
Uzbekistan	4,823	7,546	7,645	8,023	5,524	2,691	1,087	1,905	4,982	2,272	-290
Yemen	6,922	8,216	6,485	5,222	4,384	513	89	386	873	-	-

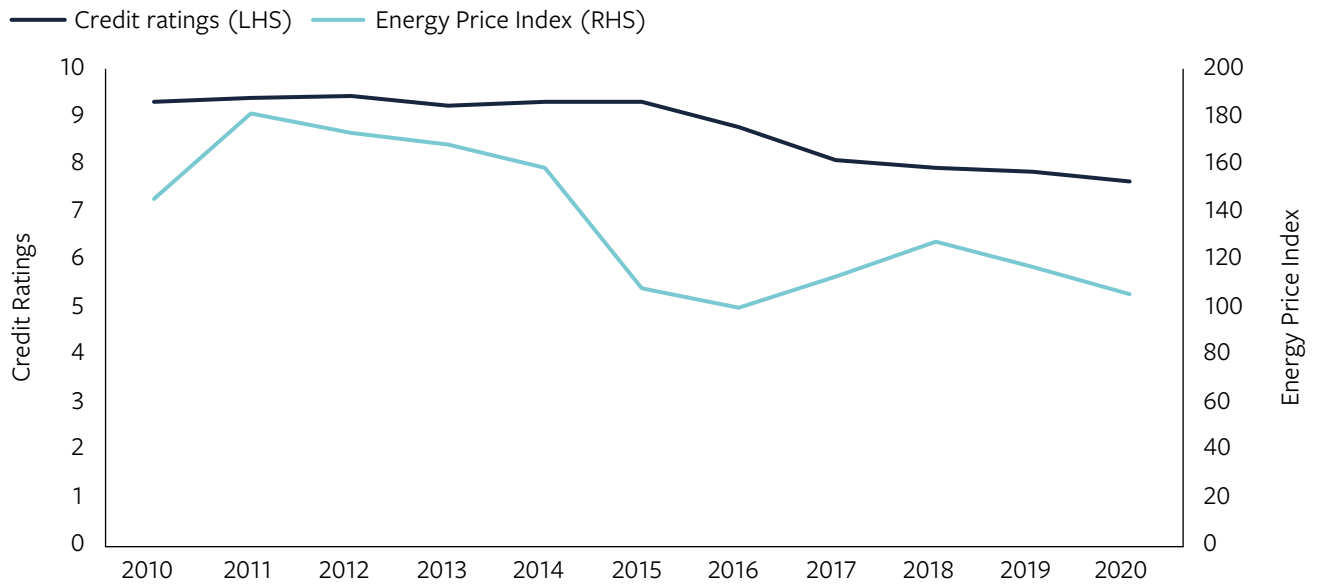
Data source: World Bank International Debt Statistics; Authors' calculation of oil and gas rents in US\$ using data from World Bank

## 4.5 Access and cost of international private finance

Countries dependent on oil and gas revenues are likely to see procyclical credit cycles in international debt markets, subject to oil and gas prices. This is because credit ratings for such economies are linked to oil and gas prices, as reflected in the

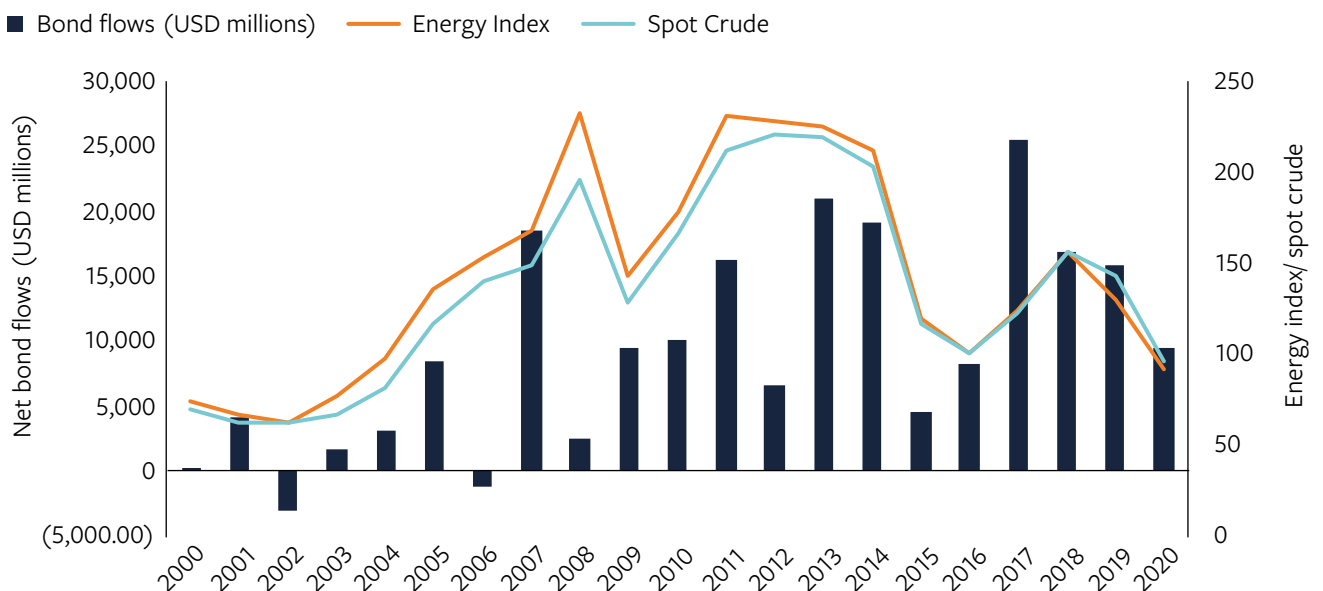
relationship between credit ratings and energy prices (Figure 14). The relationship between energy prices and credit ratings for major oil and gas exporters in turn helps to explain the relationship between energy prices and international bond issuances, as during periods of rising credit ratings and fossil fuel prices, bond issuances have expanded significantly (as shown in Figure 15).

**Figure 14** Credit ratings and fossil fuel prices (2010–2020)



Notes: Credit ratings are sourced from Moody’s and have been ‘scored’ across its 21 categories so that its top rating of A1 scores 21 and its bottom rating of C scores 1. The average score for each year (using the year-end rating where ratings had changed during the year) was calculated from all countries with credit ratings in our sample, specifically Angola, Azerbaijan, Bolivia, Colombia, Congo, Ecuador, Egypt, Gabon, Kazakhstan, Mozambique, Nigeria, Papua New Guinea, Uzbekistan and Venezuela.

**Figure 15** International bond issuances and energy prices (2000–2020)



Data source: World Bank Development indicators; IMF Primary Commodity Price System

Note: Bonds are net flow of international bonds for fossil fuel dependent countries identified in the study. Data is only available for 14 of our sample countries: Angola, Azerbaijan, Bolivia, Colombia, Congo, Ecuador, Egypt, Gabon, Kazakhstan, Mozambique, Nigeria, Papua New Guinea, Uzbekistan and Venezuela.

There are a few caveats. First, the relationship between credit ratings and energy prices does not follow short-term ‘dips and troughs’ in commodity markets (although it more closely follows commodity prices over the medium term of several years). Second, there is significant variation between countries. For example, some countries’ credit ratings were stable throughout the period (Azerbaijan and Kazakhstan), while others suffered declines in credit ratings that were much sharper than those for energy prices (Venezuela, the Republic of Congo and Gabon). This is because, although fossil fuel prices are an important factor in a country’s credit rating, they are not the only one. Political and macroeconomic stability, for example, are also key determinants.

Third, Figure 15 covers the ‘commodity super-cycle’ of the post-2008 period, which was accompanied by other important factors. Loose monetary policy in advanced economies, for example, encouraged increased borrowing

by developing countries through channels unconnected to energy prices, while those with large oil and gas reserves enjoyed high demand.

Lastly, there is also a feedback mechanism that responds to greater or lesser energy revenues (beyond fiscal adjustments) during the ‘super-cycle’. As described above, some countries have established counter-cyclical fiscal rules and funds – although with different degrees of success. Angola successfully rebuilt its fiscal reserves and created a sovereign wealth fund, reducing its procyclical tendencies. Gabon used higher oil revenues to repay and restructure its external debt (2003–2008) and boosted investment spending, although this later had to be partly reversed. Nigeria introduced oil price-based fiscal rules and created a sovereign wealth fund, but these were partially undermined by weak governance. In Chad, resource funds were abandoned to finance short-term budgetary needs (Christensen, 2016).

## 5 Recommendations for addressing oil and gas dependency and debt distress

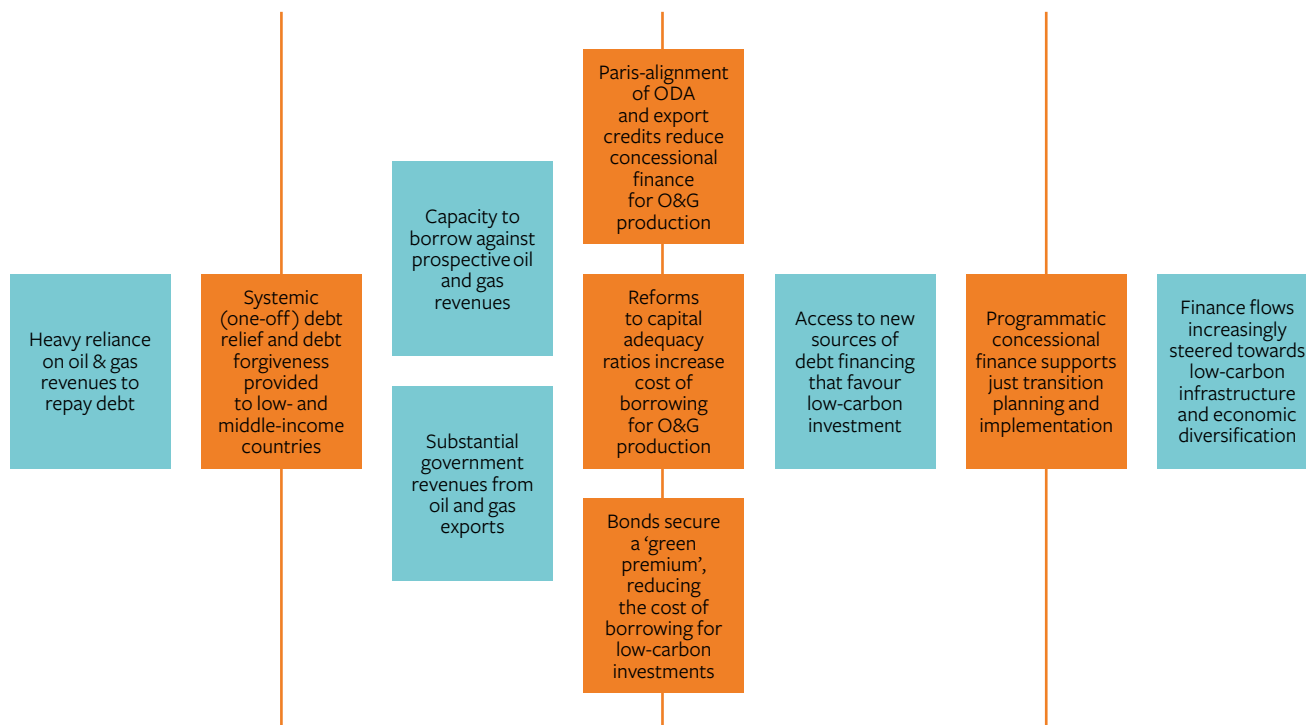
Our conceptual framework (Section 2) and new evidence (Section 4) clearly demonstrate how the combination of dependence on oil and gas revenues on the one hand, and high levels of indebtedness on the other, can make it extremely challenging for such economies to phase out fossil fuel production, and therefore meet national and global climate targets. Even just the discovery of oil and gas reserves may lead governments to borrow beyond their means as they overestimate new potential revenues; thereafter, both high and low oil prices create perverse incentives to increase the public debt burden rather than to carefully manage a finite resource and public finances. Without effective governance and regulation, SOE borrowing decisions and financial sector lending decisions may also reinforce indebtedness and macroeconomic instability.

To reiterate, external government debt is not necessarily bad if the resources are used wisely (Ahmad et al., 2019). However, unsustainable levels of debt pose a major threat to both development

and climate goals. High and growing debt service burdens mean that governments do not have enough fiscal space for other critical expenditures including health, education and social protection, all of which could enhance resilience to climate impacts. Governments are also less able to make investments that would boost productivity and diversify economic activity, such as investments in (low-carbon) power generation and transport systems.

Fortunately, there are emerging strategies and solutions that respond to both the debt and climate crises, which can offer politically and economically feasible pathways to phase out fossil fuel production while reducing a government's debt burden. A combination of international support (see Figure 16) and domestic action, based on countries' capabilities and national circumstances, can help break the cycle of oil and gas dependency and high indebtedness, and enable countries to find more fiscally and environmentally sound financing streams to meet their development and climate needs.

**Figure 16** Interventions by the international community to support countries to break the cycle of oil and gas dependency and indebtedness



## 5.1 Providing debt relief and debt forgiveness

### 5.1.1 The need for systemic debt relief and debt forgiveness to low- and middle-income countries

Before discussing how oil- and gas-dependent economies can break the vicious cycle of resource dependency and debt, we reiterate that debt is not a problem specific to these economies. During the pandemic, public debt reached record highs in countries of all income levels. The debt stock of low- and middle-income countries rose by \$9 trillion in 2021 alone (World Bank, 2022d). This is not necessarily a function of poor fiscal management; many heavily indebted countries borrowed to respond to external shocks, including Covid-19, rising food and energy prices and climate change impacts. With rising debt burdens, rising

interest rates and a strengthening US dollar, external debt service payments by the poorest countries were forecast to surge by 35% between 2021 and 2022, with payments for 2023 and 2024 expected to stay high (World Bank, 2022d). Fifty-four low- and middle-income countries consequently face high levels of debt distress, preventing them from realising their national development priorities or working towards international climate goals. This is a notable increase on the 27 countries experiencing debt distress or at high risk of debt distress in 2015 (Chabert et al., 2022). Most of these countries are not major fossil fuel producers, including the two that have already defaulted (Sri Lanka and Zambia).

High indebtedness and climate change vulnerability in low- and middle-income countries are a function of profoundly unjust global

financial and energy systems. As outlined in the Introduction, many countries became wealthy through activities that fuelled climate change, such as extracting or burning fossil fuels and changing land systems. International creditors need to urgently and collectively offer systemic debt relief or – better yet – debt forgiveness for debtor countries struggling in the aftermath of external shocks. There are currently some ad hoc proposals on the table to reduce debt burdens promptly. For instance, under Ghana’s presidency, the V20 Group that represents 58 of the world’s most systemically climate-threatened economies issued calls to make debt work for climate.<sup>15</sup> First, they have suggested that the G20 provides access for all debt-distressed climate-vulnerable developing economies to its Common Framework for debt treatments, and leverage this Framework to support financing development-positive climate actions. Second, they have suggested that credit enhancement should accompany debt restructuring to attract new investment for development-positive climate action, and incentives for existing creditors to participate early. Third, given the climate-insecure future of these economies, debt treatment should support enhanced climate resilience and the transition to climate-smart development, inclusive debt-sustainability analysis that considers the investment needs of national climate strategies and plans such as Climate Prosperity Plans.

The Paris Club of major creditors, and non-Paris Club members such as China, are exploring options for debt restructuring and debt relief with Zambia and Sri Lanka, mediated by the IMF – although such support comes after both countries have defaulted. Several countries (especially Small Island Developing States) are piloting

debt-for-climate and debt-for-nature swaps, as detailed below. Perhaps most promisingly, the IMF, World Bank and India (which currently holds the G20 presidency) are convening a new Global Sovereign Debt Roundtable to agree common principles and approaches for debt restructuring to make the process more effective, time-bound and transparent. The Summit for a New Global Financial Pact in Paris in June 2023, as well as the Climate Action Summit, the Climate Ambition Summit and the SDG Summit – all to be held in 2023 – are important opportunities to advance the global debt reform agenda. The attention being paid to debt burdens and distress across the world, and the relevance for climate-vulnerable nations, is critical. These initiatives must also consider the debt challenges faced by oil and gas revenue dependent nations.

Although these ideas and initiatives are welcome, they do not provide the transformative solutions necessary in the face of rising debt and its human and environmental consequences. Given the changing composition of debt, it is important that private creditors participate in debt relief and debt forgiveness initiatives, so that taxpayers in high-income countries do not end up cross-subsidising repayment of private debt. In any case, the economic recovery and sustainable fiscal management of debtor countries are in the long-term commercial interest of their private creditors.

### 5.1.2 The limits and risks of debt-for-climate and debt-for-nature swaps

There has been much interest in debt-for-climate and debt-for-nature swaps within the environmental community, with proposals

<sup>15</sup> These calls were made in the V20 Group’s Accra-Marrakech Agenda Draft for Consultation available at [www.v-20.org/accra-marrakech-agenda](http://www.v-20.org/accra-marrakech-agenda)



and agreements facilitated in Belize, Barbados, Cape Verde, the Seychelles and Zambia. Such agreements typically involve the debtor country directing repayments into a dedicated fund rather than to its creditor(s), with the fund then being used to finance biodiversity conservation, renewable energy construction and other green measures. However, some actors have mooted the possibility of providing compensation – including in the form of debt relief or debt forgiveness – to countries that leave fossil fuels in the ground.

At first glance, such proposals have great appeal. From the perspective of debtor countries, public funds will be spent within the country rather than flowing to international creditors. This provides important relief during periods of severe fiscal constraint, even if expenditure is restricted based on international priorities. From the perspective of developed country creditors, the funds could potentially be counted towards their international climate finance commitments. Both debtors and creditors receive praise from civil society.

However, there are also limits and risks to debt-for-climate swaps. First, debt relief and debt forgiveness can have a negative impact on a country's credit ratings (and therefore borrowing costs if these transactions are seen as indicative of credit pressures beyond what is already reflected in a country's credit profile). This solution is therefore not attractive to oil and gas-revenue dependent countries that want to retain affordable access to international capital markets. Whether or not debt-for-climate swaps will be regarded as 'an event of default' by credit rating agencies and lead to rating downgrades depends on a myriad of factors. An important consideration is the size of the offer relative to the total debt. Moody's credit rating agency did not classify Barbados' 2022 debt-for-nature swap as a default, as it was too small to constitute default

avoidance (Moody's, 2022). However, it classified Belize's 2021 debt-for-nature swap as such under their definition. This is largely due to the size of Belize's debt buyback (reducing the debt stock by about 11% of GDP) at a significant discount of 45%, whereas the amount of the debt buyback in the Barbados transaction was small and did not involve a significant discount (Moody's, 2022). At the time of the transaction, Moody's analysis suggested that Belize was in distress due to its low rating of 'Caa3' and because it had already missed interest payments on its September 2021 superbond. Another factor that credit rating agencies consider is the degree of coercion, which signals that creditors are likely to incur losses, and that there are fewer financing alternatives available to the borrower (Moody's, 2022).

Second, the scope for using debt-for-climate swaps to 'keep it in the ground' is likely to be limited to undeveloped and unassigned fossil fuel reserves (West, 2010). If production has commenced, host governments are likely to have service contracts in place, i.e. the long-term agreements necessary to acquire international oil companies' expertise and capital without having to hand over the field and production ownership rights to them. Attempts by the host government to break existing oil and gas service contracts to obtain debt relief from creditors are likely to entail significant financial and legal risks, which can have wider reputational and financial effects for the country.

Even if all parties reach preliminary agreement around international compensation to keep oil and gas reserves in the ground, there are technical and political challenges in reaching a consensus on their monetary value. Although the fossil fuel industry has long-established ways of undertaking similar calculations, each country and project context is different. Calculations entail

high uncertainty, including the probability of a field being developed, the costs of developing and operating that field, and the risk of stranded assets under different energy transition scenarios. The matter is further complicated by secrecy around reserve levels; governments' unrealistic expectations about future revenue streams and economic benefits; and mistrust concerning the future development of oil and gas reserves, either once compensation has been provided or with political change.

Past attempts to provide compensation in return for leaving fossil fuel reserves in the ground have failed. The most notable is Ecuador's Yasuni ITT proposal. Launched in 2007 by President Rafael Correa, the initiative proposed a moratorium on oil activities within Yasuni National Park (YNP), a protected area in the Amazon region, in exchange for \$3.6 billion in compensation to be paid by the international community over a period of 10 years, roughly half the projected revenues of conventional oil extraction. Funds were to be placed into social and environmental development programmes and the promotion of domestic renewable energy. However, by 2013 only \$336 million had been pledged (about 9% of the target compensation) and \$13.3 million delivered (0.37% of the target compensation), leading Correa to abandon the initiative, arguing that the international community had failed to embrace it. Others suggest that the initiative was poorly designed and unfeasible from a financial perspective, with high oil prices being one of the main factors for the termination of the initiative in 2013 (Bucaram et al., 2016).

Given the challenges surrounding debt-for-climate and debt-for-nature swaps, these measures should not be seen as a comprehensive solution to tackling indebtedness and resource dependency

in low- and middle-income economies. In certain contexts, they can offer much-needed fiscal space and incentives for low-carbon investment or biodiversity conservation. However, given the global debt and climate crises, they should be regarded as a second-best option relative to systemic debt relief and greening the wider financial architecture.

## 5.2 Greening the broader financial architecture

**International creditors should adopt financing arrangements that incentivise oil- and gas-rich countries to phase out rather than expand fossil fuel production.** Shifting the international financial architecture in this way will require a series of incremental reforms, many of which have already been mooted.

One measure that would green international lending and borrowing would be for bilateral and multilateral donors to align all official development assistance (ODA) and export credits with the temperature targets of the Paris Agreement. As noted, achieving net-zero emissions from the energy sector by 2050 implies that no new oil and gas fields can be approved, and that the international oil supply falls from 91 million barrels per day in 2020 to 24 million barrels per day in 2050 (IEA, 2021). If bilateral and multilateral agencies commit to lending and bond purchasing in line with these constraints, concessional finance for fossil fuel production in low- and middle-income countries will rapidly disappear, and oil and gas will have to compete with clean energy sources on a relatively level playing field (albeit already benefiting from a century of investment in fossil infrastructure). It is worth noting that many creditors have already made such commitments but have not yet fulfilled them.

Another option is to adapt the regulation of financial institutions to reflect climate-related risks to individual institutions and to global and national financial stability. The latter is particularly relevant to fossil-fuel dependent economies because there is often an associated concentration of related lending in their banking sectors. There are already initiatives to assess climate-related financial risks with developing country participation. The Network for Greening the Financial System (NGFS) aims to incentivise central banks and financial institutions to address individual and systemic financial risks from climate change and encourage greater mobilisation of green finance. It has 125 developing, emerging and developed country members and 19 observer countries (as of 1 May 2023). Current workstreams include building methodologies based on IPCC scenarios to adjust capital requirements in banks and other regulated institutions and to develop climate change-related risk management methodologies, including stress testing. They include scenario analysis of relevance to developing countries, including chronic and acute climate change, and regional and sectoral analysis; and the development of climate-sensitive capital frameworks (NGFS, 2022a; ECB, 2022a; ECB, 2022b).

Other initiatives include the Sustainable Banking and Finance Network (SBFN), a platform for knowledge-sharing and capacity-building on sustainable finance for financial sector regulators and industry associations across emerging markets, with 43 developing country members, and the United Nations Environment Programme Finance Initiative (UNEP FI), which is supporting developing countries to engage with new emerging standards of investor responsibilities and management of climate risks (including the Principles for Responsible Banking, the Collective Commitment to Climate Action and the net-zero alliances) (AfDB, 2021;

NGFS, 2022a). However, current initiatives are at present only voluntary for institutions – although they are widely expected to become compulsory in due course through the establishment and adoption of international regulatory standards. There are, however, significant challenges in establishing what new financial risk frameworks for climate change should look like given the lack of historical precedents and data (which are usually the basis for financial risk management regulatory frameworks). These initiatives also have weaknesses in scope. For example, current frameworks only consider ‘narrowly-defined sectors, markets and the macroeconomic risks’ and only domestic, not cross-border, risks despite the latter being a key transmission mechanism for global financial instability risks (BIS, 2021; ECB, 2022a; ECB, 2022b).

There are also issues that are specific to developing countries. For example, although they are being supported to implement national frameworks, only a limited number have actually committed to performing climate assessments, and there are major challenges including scarce and poor-quality data, limited expertise, and a need to adapt approaches to lower levels of financial development (AfDB, 2021; NGFS, 2022a; NGFS, 2022b). As noted, this will include examining the higher risks for fossil fuel-revenue-dependent economies with concentrations of assets in the sector. Systemic risks are a particular concern because of these concentrations, and because of the often high levels of cross-border capital flows these economies are typically subject to. Greater analysis of these issues is needed.

A third option to green international lending and borrowing is for private creditors to accept restructuring of existing debt into certified sustainability-linked bonds (SLB) and green bonds. SLBs are unrestricted debt instruments whereby

the interest rate is based on environmental performance. If the bond issuer performs well on pre-agreed, climate-related key performance indicators, the interest rate is lower. If they do not achieve the key performance indicators, the cost of servicing the debt is higher. Green bonds are bonds issued to finance specific environmental or climate projects, most commonly in infrastructure. There has been an exponential growth in green bonds in the last five years driven by demand from investors who have become increasingly interested in greening their investment portfolios and buoyant issuances by sovereigns and multilateral development institutions (CBI, 2022).

However, such restructuring of private debt faces significant challenges. The increased diversity of creditors in the last decade means that comprehensive debt restructuring is complex. Private investors are focused on their fiduciary responsibilities to address their investors' interest and their engagement in debt restructuring processes has been patchy. The G20 Common Framework (CF) was a welcome initiative when established in 2020 as a collective forum to negotiate debt restructuring on a principle of 'comparability of treatment' for all creditors. But, to date, only three countries have applied (Chad, Ethiopia and Zambia) and private creditors have been unenthusiastic and, in some instances, have not been engaged in negotiations. These barriers will need to be addressed if substantial progress is to be made in this regard (Georgieva and Pazarbasioglu, 2021).

The measures proposed above may help to increase the cost of borrowing for oil and gas production while reducing the cost of borrowing for lower-carbon assets and activities. Collectively, they can begin to break the cycle of indebtedness and dependency. However, such financial reforms

will not be sufficient to help oil- and gas-producing countries plan, finance and deliver a better future for their citizens. These countries may also need international development and climate finance to secure a just transition and support structural economic transformation.

### 5.3 Providing programmatic concessional finance at scale

Development and climate finance are often criticised for being slow, transaction-heavy and highly projectised, resulting in a fragmented mix of terms, reporting requirements and financing mechanisms for client countries (Acharya et al., 2006; Pickering et al., 2017; Keijzer et al., 2020; Roberts et al., 2021). The development and climate finance architecture is further criticised for the failure to coordinate in the pursuit of common goals or synergies.

In response, a promising new approach has emerged to provide international support to national energy transitions. Among the many initiatives announced at COP26 in 2021, few generated as much interest as the JETP between South Africa and five international partners: the EU, France, Germany, the UK and the US. Through this deal, the international community committed around \$8.5 billion to support the South African government to decarbonise its power generation sector and stimulate investment in the green industry (for example, electric vehicle manufacturing and green hydrogen production). JETPs have also been announced to support decarbonisation of the power sector in Indonesia and Vietnam.

If designed and delivered well, programmatic concessional finance at this scale has the potential to secure political will and mobilise affordable finance at the scale needed to drive

system change. However, to date the JETPs that have been announced have largely tackled coal-fired power generation, rather than oil and gas production. Exploratory dialogues with Egypt and Nigeria are reported to be stagnating. It is clear that a vastly more ambitious effort would be required to support such oil- and gas-dependent economies to navigate their energy transitions.

Even the early promise of South Africa's JETP will be difficult to replicate elsewhere, as the country is an outlier among developing and emerging economies. South Africa recently experienced difficult national conversations about its future, specifically how to establish a more just society while securing the interests of (enough) elites to discourage them from choices that could fuel instability and conflict. It has an exceptionally dynamic, diverse and assertive civil society forged during the fight against apartheid, and which now includes a strong environmental lobby. It has deep (albeit unequally distributed) capabilities and resources in government, industry and civil society. It also has a failing power generation system that urgently needs reform and investment to achieve development and climate goals (Hadley et al., 2022).

Few other low- and middle-income countries share these traits, particularly highly indebted oil and gas producers, which are often characterised by weak institutions and governance. Without a coherent and detailed national vision for a just energy transition coupled with the domestic capabilities to implement that vision, it is unlikely that any levels of international debt relief or concessional finance will meaningfully resolve oil and gas dependency with its associated costs

and risks. International reform and support alone will not be sufficient: oil- and gas-dependent economies will also need far-sighted and bold national leaders, working closely with key industrial and financial actors, the civil service and civil society organisations.

## 5.4 Diversifying national economies and strengthening national institutions

### 5.4.1 Pursuing economic and export diversification

Ultimately, oil- and gas-dependent countries need economic and export diversification to generate new income streams and reduce their exposure to commodity price shocks (particularly given the likely decline in oil and gas demand in the coming decades). Using oil and gas revenues to finance productive investments in mass transit, power generation and promising green industries offers scope to expand the economy, create jobs and upskill the workforce, in comparison to, for example, subsidising fuel consumption, which disproportionately benefits higher-income households.

Economic and export diversification has been a desirable but elusive goal for many resource-dependent countries. With a few exceptions, such as Chile, Indonesia and Malaysia,<sup>16</sup> progress has been slow and uneven. Numerous factors stand in the way. In particular, windfall revenues from exports of oil and gas usually lead to an appreciation of the exchange rate, which can erode competitiveness and hold back the development of other sectors (commonly referred to as the Dutch

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16 Copper-rich Chile developed competitive agricultural and fishing industries; Indonesia reduced its dependence on the extractive sector and expanded its agriculture and manufacturing sectors; and Malaysia developed a strong manufacturing sector.

disease). Weak macroeconomic management, governance and regulatory environments deter private investment in other sectors. Infrastructure gaps and an under-skilled labour force present additional obstacles to diversification.

Oil- and gas-dependent countries have traditionally sought to diversify their economies by moving down the value chain to energy-intensive and polluting industries such as petrochemicals, fertilisers, cement and iron and steel (Peszko et al., 2020). However, in the long term this approach also locks in emission-intensive activities and perpetuates risks related to the low-carbon transition, especially if other countries and regions adopt border carbon adjustments.<sup>17</sup>

Overcoming these barriers requires a credible plan for economic development and diversification, backed up with firm political commitment, consistent public policies and substantial financial resources (Esanov, 2012). Even with large oil and gas revenues, few low- and middle-income countries feel able to make the necessary investments in infrastructure, education and training, in part because of other spending commitments and debt servicing. Reallocating resources away from inefficient subsidies is likely to be unpopular and require complementary measures to ameliorate the impacts on lower-income households and small and medium enterprises, as evidence from Colombia and Nigeria shows (Gençsü et al., 2022; Picciariello et al., 2022). Even where there is political will, oil- and gas-dependent governments will often need to work hard to acquire the national capabilities and build the institutions necessary to deliver their vision.

#### 5.4.2 Strengthening natural resource governance and public financial management

The quality of resource governance (and public finances more broadly) will determine whether countries can successfully achieve economic diversification and reduce oil and gas dependency. Low RGI scores in Section 4 suggest that most resource-rich low- and middle-income countries still have a long way to go to reduce rent-seeking and ensure revenues are used productively.

A key part of the solution involves improving the quality of public financial management systems: establishing strong macroeconomic and fiscal forecasting, a robust annual budget preparation process, reliable medium-term expenditure ceilings, timely and accurate fiscal reporting, proper disclosure of debt transactions and good public investment management (Rahim and Allen, 2018). Improvements in each of these areas can also strengthen the enforcement of fiscal rules, containing pressures to overspend, particularly in good times. Reducing the degree of pro-cyclical fiscal policy will be particularly important to enable economic diversification and private sector development. A country needs to have the capacity to smooth out the high macroeconomic volatility associated with large export price swings to avoid destabilising investment in the non-resource traded sectors. To be effective, these fiscal processes and rules must have political buy-in. Governments and citizens also benefit from independent institutions that ensure fiscal transparency and strengthen accountability. Of course, such institutions and systems take time

<sup>17</sup> A border carbon adjustment is an environmental trade policy consisting of charges on imports, and sometimes rebates on exports. The aim is two-fold: to reduce global greenhouse gas emissions and to avoid the emergence of trade advantages and disadvantages as different governments enact climate policies with different levels of ambition.

and commitment to build, but with oil and gas demand likely to fall dramatically over the next three decades, fossil fuel producers now face a looming deadline to achieve profound political and fiscal transformation.

There is no consensus as to whether resource governance failures are a major factor slowing the energy transition (Kaufmann and Picon, 2022). However, most governments and national oil companies do not publicly disclose information on current and projected spending on new oil and gas projects (NRGI, 2021d), nor do they disclose (or necessarily even calculate) how future revenues or asset valuations will vary under different energy transition scenarios. Governments, regulators,

financial institutions and citizens frequently do not have the capacity to assess these risks (Manley and Heller, 2021; Colenbrander et al., 2023). Acquiring these capabilities or partnering with independent researchers and consultants to produce this information can be one part of enabling more informed policy and investment decisions, as well as improved accountability to citizens.

Such institutional reforms take courage and vision from a country's leaders. However, they also offer an opportunity for indebted oil and gas producers to secure national stability and prosperity despite volatile international markets and an accelerating clean energy transition.



## 6 Conclusion

The world is facing catastrophic impacts from climate change. Under scenarios developed by the IPCC and the IEA, compared to 2020 levels, oil and gas production need to decline by 15% and 30% by 2030 to meet net zero emissions targets to help avoid the worst impacts (Bois von Kursk et al., 2022). Climate and energy modelling conclude that new oil and gas field developments are incompatible with reaching these targets and limiting global warming to 1.5°C (Bois von Kursk et al., 2022). Any new fields developed could lead to a missed 1.5°C target or fossil fuel-producing countries could be left with stranded assets (Bois von Kursk et al., 2022).

An end to new fossil fuel production and a rapid decline in existing production is therefore essential for human wellbeing. However, the energy transition poses a severe challenge for countries that are heavily reliant on the revenues of oil and gas exports to fund investment, consumption and debt servicing. As renewable power generation, electrification and energy efficiency measures become more competitive, demand for fossil fuels is widely expected to fall (coal demand is already declining). Consequently, so will oil and gas prices, and the revenue accruing to exporters (Fitch Ratings, 2021). The challenges will be especially stark for oil- and gas-dependent countries whose public finances are already strained by high levels of debt linked directly or indirectly to their reserves. Such economies face a vicious cycle of oil and gas dependency and indebtedness. Therefore, while climate science underscores the need to reduce or phase out fossil fuel production, oil- and gas-dependent nations may not be able to do so without structural remedies to break the cycle.

In this report, we examined the relationship between a country's dependence on oil and gas revenues and the level, composition and cost of government debt, and how this might hinder plans to phase out oil and gas production in line with global climate goals. The causal framework we developed in Section 2, based on relevant literature and supported by the analysis in Section 4, suggests that weak resource governance and institutions are key features of fossil fuel revenue-dependent countries. Indeed, effective governance of the oil and gas sector proved to be a challenge for most countries in our sample, especially low- and middle-income countries.

We anticipated that oil- and gas-dependent countries are highly vulnerable to volatile energy prices, with revenues and expenditures falling when prices decline. Such shocks can have large impacts on public finances, economic performance and ultimately living standards. Revenue typically fell more than expenditure was cut during price downturns, so countries in our sample usually increased their debt burdens to finance the deficits. Notably, the gap between rents and countries' debt service payments has narrowed in recent years. In some cases, debt service payments exceeded oil and gas rents.

We further hypothesised that when energy prices rise, the creditworthiness of countries with large oil and gas reserves increases given their improved ability to service loans. When energy prices fall, the credit ratings of oil- and gas-dependent countries deteriorate. Our analysis confirmed the link between energy prices and credit ratings, suggesting that oil- and gas-dependent countries find it cheaper to borrow during periods of high prices and more costly to



borrow during periods of low prices. Thus, these economies are incentivised to increase their debt stock during periods of high oil prices, as well as during low ones (when they borrow to maintain expenditures). The link between oil and gas prices and credit ratings has a further implication: when revenue has already fallen and there is a need to borrow to address fiscal deficits, these countries are faced with more expensive debt. This trend has been exacerbated by a wider shift in countries' creditor composition over the last decade toward more expensive sources of financing. Where data was available, we found that most countries in our sample had reduced the share of concessional borrowing; the rise of international bond issuances was also a pronounced trend.

Overall, our analysis highlights the cycle in which countries dependent on oil and gas revenues are stuck. In times of high prices, they can borrow cheaply to enable investment and spending; in times of low prices, they need to borrow to maintain expenditure, but lower credit ratings mean that they may need to turn to more expensive and riskier sources of finance. In both scenarios, the country's debt stock increases and it becomes more dependent on oil and gas revenues to service that debt. This vicious cycle means that such economies face severe fiscal and macroeconomic barriers to weaning themselves off oil and gas in line with climate targets.

Fortunately, there are several interventions that can help break the cycle of reliance on oil and gas revenues and the build-up of unsustainable levels of debt. These include the action of wealthy nations to provide urgent and collective systemic debt relief or debt forgiveness for countries struggling with mounting fiscal and climate-related challenges. They also include the adoption of international financing arrangements that incentivise oil- and gas-rich countries to phase out

rather than expand fossil fuel production (such as alignment of ODA and export credits with the temperature targets of the Paris Agreement; reform of capital adequacy ratios by central banks in high- and middle-income countries to incentivise them to proactively manage climate risks, incentivise green finance and to address systemic financial stability risks; and acceptance of the **restructuring of existing debt into SLBs and green bonds**. International development and climate finance has a crucial role to play in supporting structural economic transformation in many of these countries. Initiatives such as JETPs propose more coherent support for countries to align their national development aspirations with international climate goals.

Domestically, diversification of national economies can have multiple benefits, from job creation to enhanced fiscal resilience. Using oil and gas revenues to make long-term investments in mass transit, low-carbon power generation and resilient industries is likely to offer long-term benefits in comparison to – for example – subsidising fuel consumption, which disproportionately benefits higher-income households. Finally, global demand for fossil fuels needs to fall drastically and rapidly to make the case for a fossil-free future. Wealthy countries must show their commitment to rapidly reaching net-zero emissions by putting in place bolder policies to cut down fossil fuel use across different sectors of the economy, incentivising instead clean energy alternatives and much higher levels of energy efficiency.

Any solutions are likely to be inherently complex (technically and politically) and unlikely to work alone. There is a need for profound interventions in, and reforms to, the international financial architecture to tackle the immediate debt crisis and change the incentives for borrowing in ways that can help break the vicious cycle of oil and gas

dependency and indebtedness. But countries with large oil and gas reserves must also strengthen their institutions and diversify their economies if they want to successfully navigate the impending energy transition. Therefore, there is a need for a

far-sighted and joined-up approach to supporting oil and gas producers to achieve viable and sustainable pathways, not only for those countries but also for the planet.

# References

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- Acharya, A., Fuzzo de Lima, A. and Moore, M. (2006) 'Proliferation and fragmentation: transaction costs and the value of aid' *Journal of Development Studies* 42(1): 1–21.
- AfDB – African Development Bank (2021) *Climate risk regulation in Africa's financial sector and related private sector initiatives*, Abidjan: African Development Bank.
- AfDB – African Development Bank (2022) *AfDB President visits Dangote Industries oil refinery and petrochemical complex*. Abidjan: African Development Bank.
- Aghabarari, L. and Rostom, A. (2019) *Credit cycles in countries in the MENA region – do they exist do they matter*. Washington DC: World Bank.
- Ahmad, E. et al. (2019) *Scaling up investment in sustainable urban infrastructure: A guide to national and subnational reform*. London and Washington DC: Coalition for Urban Transitions.
- Akacem, M., Miller, D. D. and Faulkner, J. L. (2020) 'Resource curse and institutions' in *Oil, institutions and sustainability in MENA: a radical approach through the empowerment of citizens*. Springer.
- Alberola-Ila, E., Aizenman, J., Moreno, R. and Zampolli, F. (2017) *The commodity cycle: macroeconomic and financial stability implications. An introduction*. Basel: Bank for International Settlements.
- Arezki, R., Ramey, V. and Sheng, L. (2017) 'News shocks in open economies' *Quarterly Journal of Economics* 132: 103–155.
- Bhattacharyya, S. and Holder, R. (2010) 'Natural resources, democracy and corruption' *European Economic Review* 54(4): 608–621.
- BIS – Bank for International Settlements (2021) *Climate-related risk drivers and their transmission channel*. Basel: Bank for International Settlements.
- Bois von Kursk, O. et al. (2022) *Navigating energy transitions: mapping the road to 1.5°C*. Winnipeg, MB: IISD.
- Bova, E., Medas, P. and Poghosyan, T. (2016) *Macroeconomic stability in resource-rich countries: the role of fiscal policy*. Washington DC: International Monetary Fund.
- Bräutigam, D. and Gallagher, K.P. (2014) 'Bartering globalization: China's commodity-backed finance in Africa and Latin America' *Global Policy* 5(3): 346–352.
- Bucaram, S., Fernandez, M.A. and Grijalva, D. (2016) *Sell the oil deposits!: A financial proposal to keep the oil underground in the Yasuni National Park, Ecuador*. Helsinki: United Nations University World Institute for Development Economics Research.
- Budget Office of the Federation (2021) *2022–2024 Medium term expenditure framework and fiscal strategy*.
- Bulte, E.H., Damania, R. and Deacon, R.T. (2005) 'Resource intensity, institutions and development' *World Development* 33(7): 1,029–1,044.
- Busse, M. and Gröning, S. (2013) 'The resource curse revisited: governance and natural resources' *Public Choice* 154: 1–20.
- Calderón, C. and Zeufack, G. A. (2020) *Borrow with sorrow? The changing risk profile of Sub-Saharan Africa's debt*. World Bank.

- Calverley, D. and Anderson, K. (2022) *Phaseout pathways for fossil fuel production within Paris-compliant carbon budgets*. Manchester: International Institute for Sustainable Development.
- Caselli, F. et al. (2022) *The return to fiscal rules*. Washington DC: IMF.
- CBI – Climate Bonds Initiative (2022) *Green Bond Pricing in the Primary Market: H2 (Q3-Q4) 2022*. London: Climate Bond Initiative.
- Chabert, G., Cerisola, M. and Hakura, D. (2022) *Restructuring Debt of Poorer Nations Requires More Efficient Coordination*. Blog. IMF.
- Chenet, H., Ryan-Collins, J. and van Lerven, F. (2021) ‘Finance, climate-change and radical uncertainty: towards a precautionary approach to financial policy’ *Ecological Economics* 183(106957).
- Christensen, B.V. (2016) *Challenges of low commodity prices for Africa*. Basel: Bank for International Settlements.
- Climate Action Tracker (2022) *2100 warming projections: emissions and expected warming based on pledges and current policies* (<https://climateactiontracker.org/global/temperatures/>).
- Coffin, M., Dalman, A. and Grant, A. (2021) *Beyond petrostates: the burning need to cut oil dependence in the energy transition*. London: Carbon Tracker.
- Cohen, D. and Harnoys-Vannier, B. (2023) *The resistible rise of external debt in the Global South (2011-2021)*. Paris: Finance for Development Lab.
- Colenbrander, S., Pettinotti, L. and Cao, Y. (2022) *A fair share of climate finance? An appraisal of past performance, future pledges and prospective contributors*. London: ODI.
- Colenbrander, S. et al. (2023) ‘Low-carbon transition risks for India’s financial system’ *Global Environmental Change* 78.
- Congressional Research Service (2018) *Debt-for-nature initiatives and the Tropical Forest Conservation Act (TFCA): status and implementation*. Washington DC: Congressional Research Service.
- Coulibaly, S. and Kouame, W.A.K. (2019) *Central African Republic economic update: strengthening domestic revenue mobilization to sustain growth in a fragile state*. Washington DC: World Bank Group.
- Crippa, M. et al. (2022) *CO2 emissions of all world countries*. Luxembourg: Publications Office of the European Union.
- Cust, J. and Mihalyi, D. (2017) *Evidence for a presource curse? Oil discoveries, elevated expectations, and growth disappointments*. Washington DC: World Bank.
- Daniels, J.P. (2022) ‘Colombia’s tax chief defends reform plan targeting oil and coal’ *Financial Times* 25 October.
- Davoodi, H.R. et al. (2022) *Fiscal Rules and Fiscal Councils: recent trends and performance during the COVID-19 pandemic*. Washington DC: IMF.
- Debt Management Office Nigeria (2016) *Nigerian debt management strategy (2016–2019)*.
- Debt Management Office Nigeria (2022) *Nigerian debt management strategy (2020–2023)*.
- Domanski, D., Kearns, J., Lombardi, M.J. and Song Shin, H. (2015) ‘Oil and debt’ *BIS Quarterly Review*.
- EBRD – European Bank for Reconstruction and Development (2018) *The fiscal implications for Kazakhstan of worldwide transition to a greener global economy*. London: European Bank for Reconstruction and Development.
- EBRD (2022) *Transition report 2022–2023: country assessments – Kazakhstan*.
- ECB – European Central Bank (2022a) *2022 Climate Risk Stress*. Frankfurt: European Central Bank.

- ECB – European Central Bank (2022b) *Macro-financial scenarios for the 2022 climate risk stress test*. Frankfurt: European Central Bank.
- Eichengreen, B. (2002) *Financial crises and what to do about them*. Oxford: Oxford University Press.
- Eller, S., Hartley, P. and Medlock, K. (2011) ‘Empirical evidence on the operational efficiency of National Oil Companies’ *Empirical Economics* 40(3): 623–643.
- Erten, B. and Ocampo, J.A. (2012) *Super-cycles of commodity prices since the mid-nineteenth century*. New York: UN Department of Economic and Social Affairs.
- Esanov, A. (2012) *Diversification in resource-dependent countries*. Natural Resource Governance Institute.
- Evans, S. (2021) *Analysis: Which countries are historically responsible for climate change?* ([www.carbonbrief.org/analysis-which-countries-are-historically-responsible-for-climate-change/](http://www.carbonbrief.org/analysis-which-countries-are-historically-responsible-for-climate-change/))
- Fernández, A., Schmitt-Grohé, S. and Uribe, M. (2020) *Does the commodity super cycle matter?*. National Bureau of Economic Research.
- Fitch Ratings (2021) *Climate change ‘stranded assets’ are a long-term risk for some sovereigns*.
- Flandreau, M. and Sussman, N. (2003) ‘Old sins: exchange clauses and European foreign lending in the nineteenth century’ in *Debt denomination and financial instability in emerging-market economies*. Chicago, IL: University of Chicago Press.
- Garavito, T. and Thanki, N. (2022) ‘Colombia’s shift to the left: a new “pink tide” in Latin America?’ *Al Jazeera*.
- Gençsü, I., Walls, G., Picciariello, A. and Alasia, J. (2022) *Nigeria’s energy transition: reforming fossil fuel subsidies and other financing opportunities*. London: ODI.
- Georgieva, K. and Pazarbasioglu, C. (2021) ‘The G20 Common Framework for Debt Treatments must be stepped up’. Blog. IMF.
- Government of Nigeria (2022) *Medium term expenditure framework and fiscal strategy paper 2023–2025*. Government of Nigeria.
- Hadley, S. et al. (2022) *Country platforms for climate action: something borrowed, something new?*. London: ODI.
- Hartwell, C. A., Horvath, R., Horvathova, E. and Popova, O. (2019) ‘Comparative economic studies’ *Democratic Institutions, Natural Resources, and Income Inequality* 61: 531–550.
- Heller, P. and Mihalyi, D. (2019) *Massive and misunderstood data-driven insights into national oil companies*. Natural Resource Governance Institute.
- Herrera, S., Kouame, W.A. and Mandon, P. (2019) *Why some countries can escape the fiscal pro-cyclicality trap and others cannot*. Washington DC: World Bank.
- Hilscher, J. and Nosbusch, Y. (2007) *Determinants of sovereign risk: macroeconomic fundamentals and the pricing of sovereign debt*.
- IEA – International Energy Agency (2020) *Kazakhstan energy profile*. Paris: IEA.
- IEA (2021a) *Net zero by 2050*. Paris: IEA.
- IEA (2021b) *What is behind soaring energy prices and what happens next?*. Paris: IEA.
- IEA (2022) *Kazakhstan 2022 energy sector review*. Paris: IEA.
- IMF – International Monetary Fund (2011) *Fiscal monitor: addressing fiscal challenges to reduce economic risk*.

- IMF (2017) *Republic of Kazakhstan – 2017 Article IV Consultation – press release and staff report*. International Monetary Fund.
- IMF (2019a) *Chad: selected issues*. IMF Country Report 19/259.
- IMF (2019b) *Nigeria: selected issues*. IMF Country Report No. 19/93.
- IMF (2020) *The international architecture for resolving sovereign debt involving private-sector creditors – recent developments, challenges, and reform options*. Washington DC: IMF.
- IMF (2021) *Chad: request for a three-year arrangement under the Extended Credit Facility – press release; staff report; and statement by the Executive Director for Chad*. IMF Country Report No. 21/267.
- IMF (2022) *Colombia: 2022 Article IV Consultation – press release; staff report; and statement by the Executive Director for Colombia*. Washington DC: IMF.
- IMF (2022) *Republic of Kazakhstan – 2021 Article IV Consultation*.
- IPCC – Intergovernmental Panel on Climate Change (2018) ‘Summary for policymakers’ in V. Masson-Delmotte et al. (eds) *Global warming of 1.5°C. An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change*. Geneva: Intergovernmental Panel on Climate Change.
- IPCC (2022) ‘Summary for policymakers’ in *Climate change 2022: mitigation of climate change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge and New York: Cambridge University Press.
- Isham, J., Woolcock, M., Pritchett, L. and Busby, G. (2005) ‘The varieties of resource experience: natural resource export structures and the political economy of economic growth’ *World Bank Economic Review*.
- Kartha, S. et al. (2020) *The carbon inequality era: an assessment of the global distribution of consumption emissions among individuals from 1990 to 2015 and beyond*. Oxford and Stockholm: Oxfam, Stockholm Environment Institute.
- Kaufmann, D. and Picon, M. (2022) *The audacity deficit in natural resource governance: insights from a survey and implications ahead*. Washington DC: Brookings Institution.
- Keijzer, N., Klingebiel, S. and Scholtes, F. (2020) ‘Promoting ownership in a “postaid effectiveness” world: evidence from Rwanda and Liberia’ *Development Policy Review* 38(S1): O31–O49.
- Knoema (2021) ‘China has become the developing world’s largest creditor’ (<https://knoema.com/infographics/vsnfkkg/china-has-become-the-developing-world-s-largest-creditor>).
- Kraul, C. (2021) *Ecopetrol’s crude production falls 3.6% on quarter due to social unrest in Colombia*. New York: S&P Global.
- Long, G. (2021a) ‘Colombia’s Ecopetrol seeks to reduce dependence on oil’ *Financial Times* 29 March.
- Long, G. (2021b) ‘Colombia’s investment grade status at stake in tax battle’ *Financial Times*.
- Manley, D. and Heller, P. (2021) *Risky bet: national oil companies in the energy transition*. New York: Natural Resource Governance Institute.
- Manley, D. and Heller, P.R. (2019) *Hidden giants: it’s time for more transparency in the management and governance of national oil companies*. IMF Finance and Development.
- McKinsey & Company (2022) *Global energy perspective 2022. Executive summary*. McKinsey & Company.



- Mehlum, H., Moene, K. and Torvik, R. (2006) 'Cursed by resources or institutions?' *The World Economy* 29(8): 1,117–1,131.
- Mihalyi, D., Adam, A. and Hwang, J. (2020) *Resource-backed loans: pitfalls and potential*. Natural Resource Governance Institute.
- Mihalyi, D. and Fernandez, L. (2018) *How did fiscal rules hold up in the commodity price crash?.* New York: Natural Resource Governance Institute.
- Miller, M. and Hart, T. (2010) *Strengthening public investment management: reviewing the role of external actors*. London: ODI.
- Moody's (2022) *FAQ on debt-for-climate/nature-swaps*. New York: Moody's Investor Service.
- Mountford, H. et al. (2018) *Unlocking the inclusive growth story of the 21st century: accelerating climate action in urgent times*. Washington DC: Global Commission on the Economy and Climate.
- NASA (2022) *2021 tied for 6th warmest year in continued trend, NASA analysis shows* ([www.nasa.gov/press-release/2021-tied-for-6th-warmest-year-in-continued-trend-nasa-analysis-shows/](http://www.nasa.gov/press-release/2021-tied-for-6th-warmest-year-in-continued-trend-nasa-analysis-shows/)).
- NGFS – Network for Greening the Financial System (2022a) *NGFS Scenarios for central banks and supervisors*, Paris: Network for Greening the Financial System.
- NGFS (2022b) *Physical Climate Risk Assessment: Practical Lessons for the Development of Climate Scenarios with Extreme Weather Events from Emerging Markets and Developing Economies*, Paris: Network for Greening the Financial System.
- NRGI – Natural Resource Governance Institute (2017) *2017 Resource Governance Index: Mozambique*. New York: National Resource Governance Institute.
- NRGI (2021a) *2021 Resource Governance Index: Colombia*. New York: Natural Resource Governance Institute.
- NRGI (2021b) *2021 Resource Governance Index: Azerbaijan*. New York: Natural Resource Governance Institute.
- NRGI (2021c) *2021 Resource Governance Index: Nigeria*. New York: Natural Resource Governance Institute.
- NRGI (2021d) *2021 Resource Governance Index*. New York: Natural Resource Governance Institute.
- OECD – Organisation for Economic Cooperation and Development (2007) *Lessons learnt from experience with debt-for-environment swaps in economies in transition*. Paris: OECD.
- OECD (2020) *The impact of Coronavirus (COVID-19) and the global oil price shock on the fiscal position of oil-exporting developing countries*. OECD.
- Oxford Policy Management (2018) *The fall and rise of the Nigerian Petroleum Industry Governance Bill*.
- Oxford Policy Management (n.d.) *Facility for Oil Sector Transparency and Reform in Nigeria*.
- Peszko, G. et al. (2020) 'Diversification and cooperation in a decarbonizing world: climate strategies for fossil fuel-dependent countries' *Climate Change and Development*.
- Picciariello, A., Quevedo, A. and Gençsü, I. (2022) *Phasing out fossil fuel subsidies in Colombia: a crucial step towards a just energy transition*. London: ODI.
- Pickering, J., Betzold, C. and Skovgaard, J. (2017) 'Special issue: managing fragmentation and complexity in the emerging system of international climate finance' *International Environmental Agreements: Politics, Law and Economics* 17: 1–16.
- Pörtner, H.-O. et al. (2022) *Climate change 2022: impacts, adaptation and vulnerability*. Geneva: IPCC.
- Price Waterhouse Coopers (2021) *Evaluating the Nigerian gas value-chain*.

- Rahim, F.S. and Allen, R. (2018) *Fiscal rules and PFM in resource-rich developing countries* (<https://blog-pfm.imf.org/en/pfmblog/2018/12/fiscal-rules-resource-rich>).
- Rivetti, D. (2022) *Achieving comparability of treatment under the G20's Common Framework*. Equitable Growth, Finance & Institutions Notes. Washington DC: World Bank.
- Roberts, J. et al. (2021) 'Rebooting a failed promise of climate finance' *Nature Climate Change* 11: 180–182.
- Ruzzante, M. and Sobrinho, N. (2022) *The 'fiscal presource curse': giant discoveries and debt sustainability*. Washington DC: IMF.
- S&P Global Ratings (n.d.) *Guide to credit rating essentials: what are credit ratings and how do they work?*. New York: S&P Global Ratings.
- Semieniuk, G. et al. (2022) 'Stranded fossil-fuel assets translate to major losses for investors in advanced economies' *Nature Climate Change* 12: 532–538.
- Steiner, R. and Vallejo, H. (2010) 'Mining and energy' in R.A. Hudson (ed.) *Colombia: a country study*. Library of Congress Federal Research Division.
- Stevens, P., Lahn, G. and Kooroshy, J. (2015) *Resource curse revisited*. Chatham House.
- Tyson, J. (2016) *Sub-Saharan Africa's economic downturn and its impact on financial development*. London: ODI.
- Tyson, J. (2021) *Green bonds in sub-Saharan Africa*. London: ODI.
- UNCTAD – United Nations Conference on Trade and Development (2021) *Commodities and development report 2021. Escaping from the commodity dependence trap through technology and innovation*. Geneva: UN.
- UNDP – United Nations Development Programme (2015) *Towards human resilience: sustaining MDG progress in an age of economic uncertainty*. UNDP.
- USAID – United States Agency for International Development (2022) *Colombia: climate change fact sheet*. USAID.
- van der Ploeg, F. and Poelhekke, S. (2009) 'Volatility and the natural resource curse' *Oxford Economic Papers* 61(4): 727–760.
- Vohra, K. et al., (2021) 'Global mortality from outdoor fine particle pollution generated by fossil fuel combustion: Results from GEOS-Chem' *Environmental Research* 195: 110754.
- Volz, U. et al. (2020) *Debt relief for a green and inclusive recovery*.
- West, J. (2010) *Compensating indebted countries for keeping fossil fuels in the ground*. Berlin, London and Boston: Debt Relief for Green and Inclusive Recovery.
- Wheeler, E. (2017) 'Kazakhstan's renewable energy quest' *The Diplomat*.
- World Bank Group (2022) *Country climate and development report: Kazakhstan*. Washington DC: The World Bank Group.
- World Bank (2015) *Adjusting to lower oil prices; challenging times ahead*. World Bank Group.
- World Bank (2020) *A slow recovery through the COVID-19 crisis: Kazakhstan economic update – December 2020*. World Bank Group.
- World Bank (2022a) *Colombia: leading the path to sustainability in Latin America*. Washington DC: World Bank.
- World Bank (2022b) *Colombia: the first sovereign green bond in local currency in Latin America*. Washington DC: World Bank.



World Bank (2022c) *Global economic prospects, January 2022*. Washington DC: World Bank.

World Bank (2022d) *International debt report 2022: updated international debt statistics*. Washington DC: World Bank.

World Bank (2022e) *The continuing urgency of business unusual (English). Nigeria*. Washington DC: World Bank Group.

World Energy Council (2022) *Kazakhstan energy issues monitor 2022*.

Xiao, M., Junne, T., Haas, J. and Klein, M. (2021) 'Plummeting costs of renewables: are energy scenarios lagging?' *Energy Strategy Reviews* 35: 100636.

Yusuf, A. and Mohd, S. (2021) 'The impact of government debt on economic growth in Nigeria' *Cogent Economics & Finance* 9(1).

# Appendix 1 Country case studies

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This section provides three case studies that present a more comprehensive analysis of the complex links between fossil fuel dependency, debt and a country's clean energy transition strategy. The three countries investigated are Nigeria, Colombia and Kazakhstan.

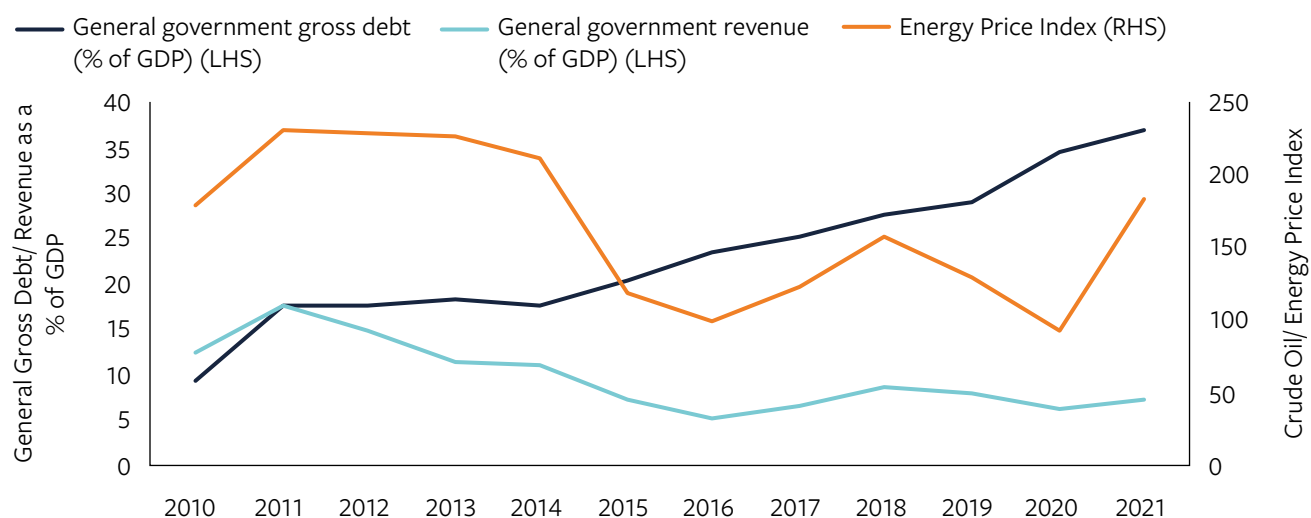
## A1.1 Nigeria

### Nature and degree of dependency

Nigeria is the world's fifteenth-largest crude oil producer. On average, 1.77 million barrels of crude oil were produced per day over the last three years (Government of Nigeria, 2022). Oil and gas currently account for about 65% of government revenues and 95% of foreign exchange earnings (Budget Office of the Federation, 2021; IMF, 2019b; World Bank, 2022e). Despite the sector accounting for only 10% of GDP, the economy is relatively undiversified compared to other middle-income countries, and a material proportion of the economy is related to the oil and gas sector (IMF, 2019b). Nigeria's dependence on oil and gas has contributed to procyclical fiscal policy dilemmas, institutional and governance challenges and a shift to more expensive sources of debt.

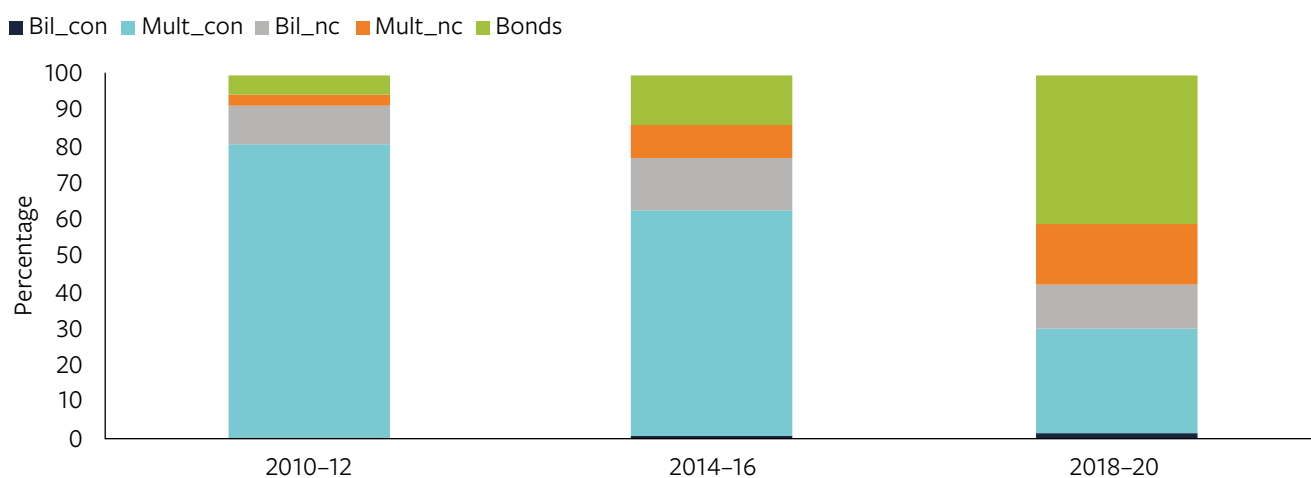
### Level and composition of debt

Debt levels more than doubled as a percentage of GDP between 2007 (21.9% of GDP) and 2022 (49.2% of GDP), and debt interest payments accounted for 45% of total government revenues by 2022 (World Bank, 2022e). The increase in debt is shown in Figure A1.1. This debt has accumulated year-on-year since 2013, with the government persistently running fiscal deficits (World Bank, 2022e; Budget Office of the Federation, 2021).

**Figure A1.1** Gross government debt and revenue as a percentage of GDP and oil and energy prices (2010–2021)

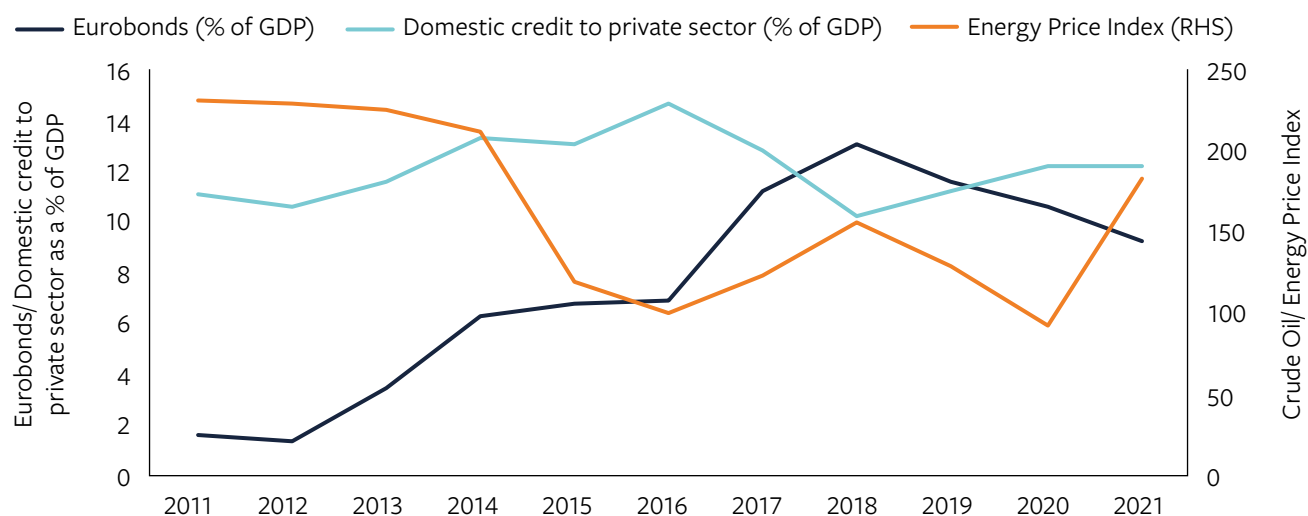
Source: IMF Fiscal Monitor; IMF Primary Commodity Price System

External debt has increased, from 16% of total public debt in 2015 to 33% in 2019 (Debt Management Office Nigeria, 2022). Non-concessional public and private external debt also rose, from less than 10% of total debt in 2010–2012 to nearly 60% in 2018–2020 (Figure A1.2). Part of this increase was driven by increased borrowing through Eurobonds from international capital markets, which reached more than 40% of total debt in 2018–2020 (Figure A1.3) and about 10% of GDP by 2021. Private credit has, however, remained modest relative to GDP because, although private investment is needed to boost growth and has been supported by direct lending from the Central Bank of Nigeria, it has been deterred by exchange rate policy, high inflation and increasing insecurity.

**Figure A1.2** Changing composition of total external debt stock (PPG) (averages for stated periods)

Source: World Bank, International Debt Statistics

Note: 'Bil\_con' is bilateral concessional debt, 'Multi-con' is multilateral concessional debt, 'Bil\_nc' is bilateral non-concessional debt, 'Multi\_nc' is multilateral non-concessional debt.

**Figure A1.3** Eurobonds and domestic credit to private sector as a percentage of GDP; energy prices (2010–2021)

Source: Moody's, elaborated by author; World Development Indicators database; IMF Primary Commodity Price System

This shift towards non-concessional and private sector debt has also been a factor in Nigeria's increasing debt servicing as such sources of finance typically have higher interest rates than the concessional debt they have replaced. Overall, debt is modest relative to GDP and below the Budget Office of the Federation target of 40% of GDP (Budget Office of the Federation, 2021). However, Nigeria's ability to service its debt is reliant on oil revenues and access to private international capital.

## Commitments to reducing dependency

The government has sought to improve revenue collection and debt management and diversify the economy away from oil and gas. The following reforms have been introduced to improve the management of public oil and gas revenues and reduce national debt:

- In 2000, the Debt Management Office Nigeria (DMO) was established to centrally coordinate and provide independent oversight of public debt.
- In 2011, the Nigerian Sovereign Investment Authority was established to manage a sovereign wealth fund capitalised by oil and gas revenues and to invest them predominantly in public infrastructure.
- The 2018 Petroleum Industry Governance Bill and 2021 Petroleum Industry Act have improved transparency and governance including oil price-based fiscal rules. The Petroleum Industry Act is also expected to attract much needed capital investment in the oil and gas sector.
- In 2021, the independent Nigerian Petroleum Regulatory Commission was reformed and strengthened (Christensen, 2016; Oxford Policy Management, 2018).

Although these reforms are generally well-regarded, they need further strengthening (see IMF (2019b) for a fuller discussion). More broadly, poor governance, endemic corruption and oil theft continue to undermine reform efforts (World Bank, 2022e; Price Waterhouse Coopers, 2021).

Nigeria's net fiscal revenues from oil are also reduced by high fuel subsidies. For example, in 2021 and 2022, net revenues after fuel subsidies were effectively flat year-on-year, despite huge inflation in oil prices (Budget Office of the Federation, 2021; World Bank, 2022e).<sup>18</sup> The government has been reluctant to reform fuel subsidies because of their popularity with the public – and despite repeated calls to do so to boost fiscal revenues and reduce incentives for petrol consumption (World Bank, 2022e; Gençsü et al., 2022).

The government has also adopted short-term plans to maximise its oil and gas endowment, reflected in the assumptions of its medium-term expenditure framework for 2023–2025 (Table A1.1). These plans include reducing the cost of crude oil production, extended licensing of marginal oil fields, reopening previously shut-down oil wells, developing more liquified natural gas and the renewal of existing licences (Budget Office of the Federation, 2021). To support these goals, investments are being made in fossil fuel production and oil refineries, financed directly from the Federal budget as well as from the Nigerian Sovereign Investment Authority, the African Development Bank (AfDB) and private business. There are also plans to develop liquified natural gas export facilities (the government sees the gas sector as underdeveloped relative to its reserves and global demand) (Tyson, 2016; AfDB, 2022; Gençsü et al., 2022). Oil revenues have been used to finance infrastructure development including substantial non-green power and transportation (World Bank, 2022e; Price Waterhouse Coopers, 2021; Budget Office of the Federation, 2021).

**Table A1.1** Nigeria's Medium Term Expenditure Framework, 2023–2025

	2021 actual	2022 revised forecast	2023 forecast	2024 forecast	2025 forecast
Oil price benchmarks (US\$/b)	43	73	70	66	62
Oil production (mbpd)	1.48	1.60	1.69	1.83	1.83
Debt service (Naira trillions)	4.22	3.69	6.31	8.06	10.4

Source: Government of Nigeria, 2022

Overall, although debt has remained sustainable, Nigeria's progress towards reducing oil reliance and its domestic policies – particularly the development of its oil and gas sector and non-green infrastructure – are at odds with global climate targets and with its commitments to achieve net zero climate goals, including its 2021 Nationally Determined Contributions (NDCs).

<sup>18</sup> In 2022, as in 2021, Nigeria is not expected to fully benefit fiscally from higher oil prices. In 2021, while oil prices rose by two-thirds against the backdrop of global economic recovery from Covid-19, net oil revenues in Nigeria increased by only 4%, as production (including condensates) decreased from 1.83 million bpd in 2020 to 1.68 million bpd in 2021. This 'decoupling' between oil prices and related revenues occurred because the Nigerian National Petroleum Corporation (NNPC) deducted a significant portion of oil revenues to pay for the petrol subsidy. The decoupling continued in 2022, driven by low oil production, a larger unit petrol subsidy, a weaker currency and higher apparent petrol consumption (World Bank, 2022).

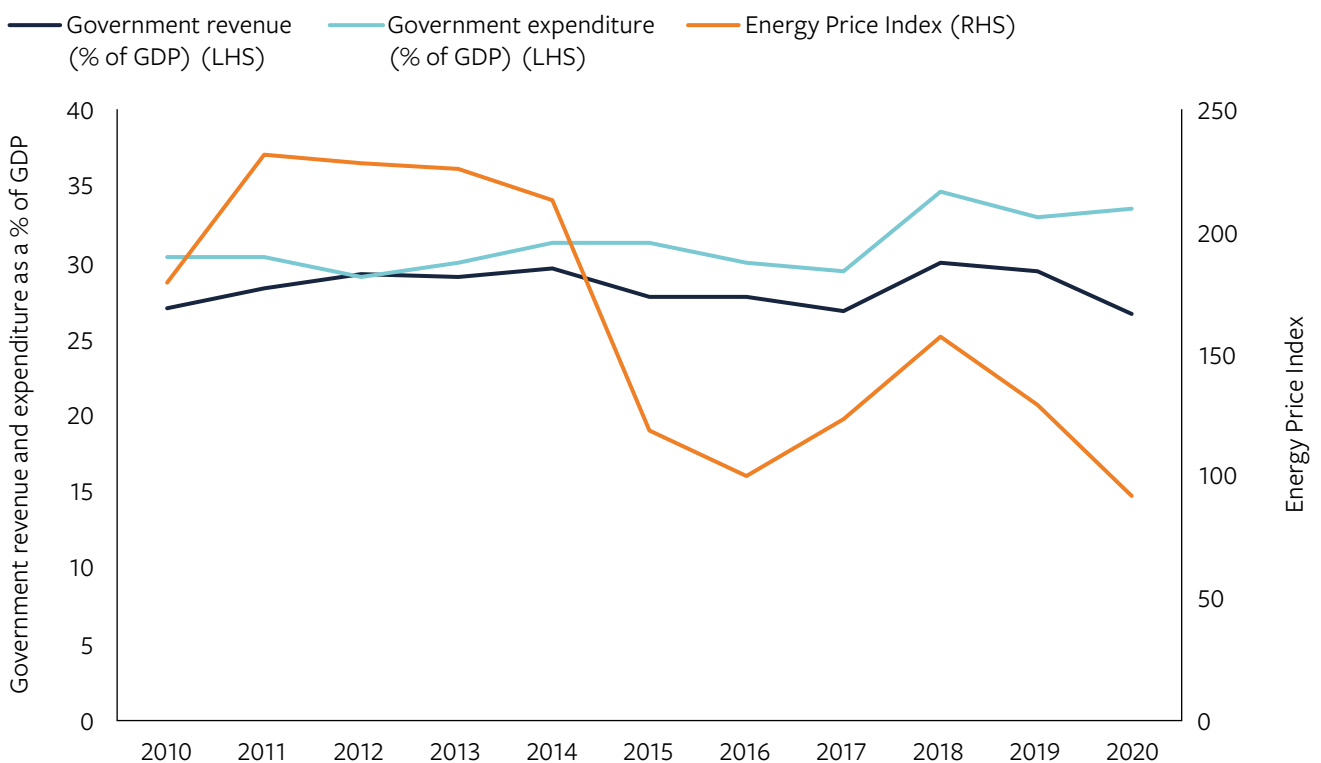
## A1.2 Colombia

### Nature and degree of dependency

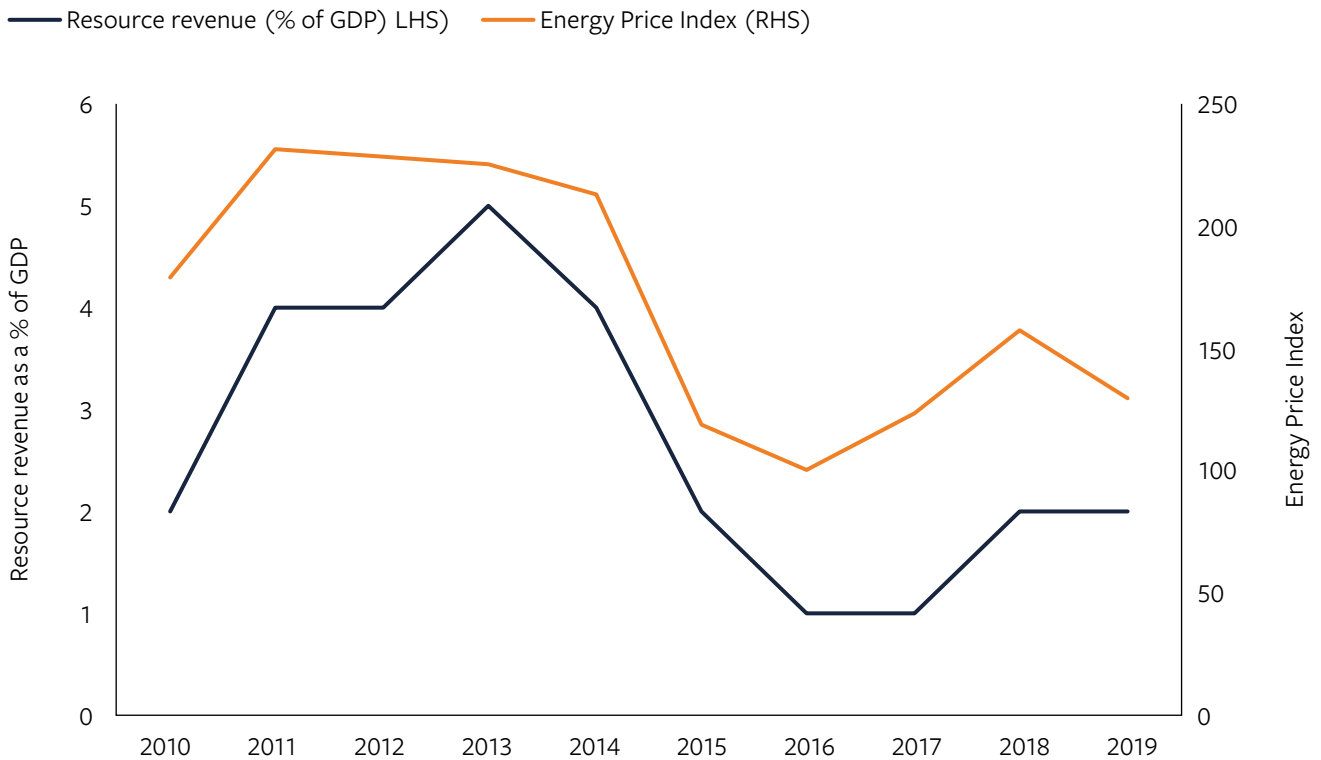
Colombia exports about half of its oil and gas production, mainly to the United States. Oil is produced by Ecopetrol (the state-owned Colombian petroleum enterprise), and private producers under licence. The sector is overseen by the National Hydrocarbons Agency, which also administers government royalties and Ecopetrol profits. Ecopetrol was privatised in 2007, but the state remains the majority shareholder. There has been public investment in oil and gas infrastructure, including pipelines and refining (Steiner and Vallejo, 2010).

Colombia is only moderately dependent on fossil fuels because, although total government revenues closely track oil and gas prices (Figure A1.4), resource revenues account for only a modest percentage of GDP and fiscal revenues. Resource revenues peaked at 5% of GDP and 16% of total government revenues during the commodity super-cycle, and then fell to as low as 1% of GDP and 5% of government revenues between 2016 and 2020 (Figure A1.5).

**Figure A1.4** Government revenues and expenditure as a percentage of GDP and energy price index (2010–2020)



Source: IMF World Economic Outlook; IMF Primary Commodity Price System

**Figure A1.5** Resource revenue as a percentage of GDP and energy price index (2010–2020)

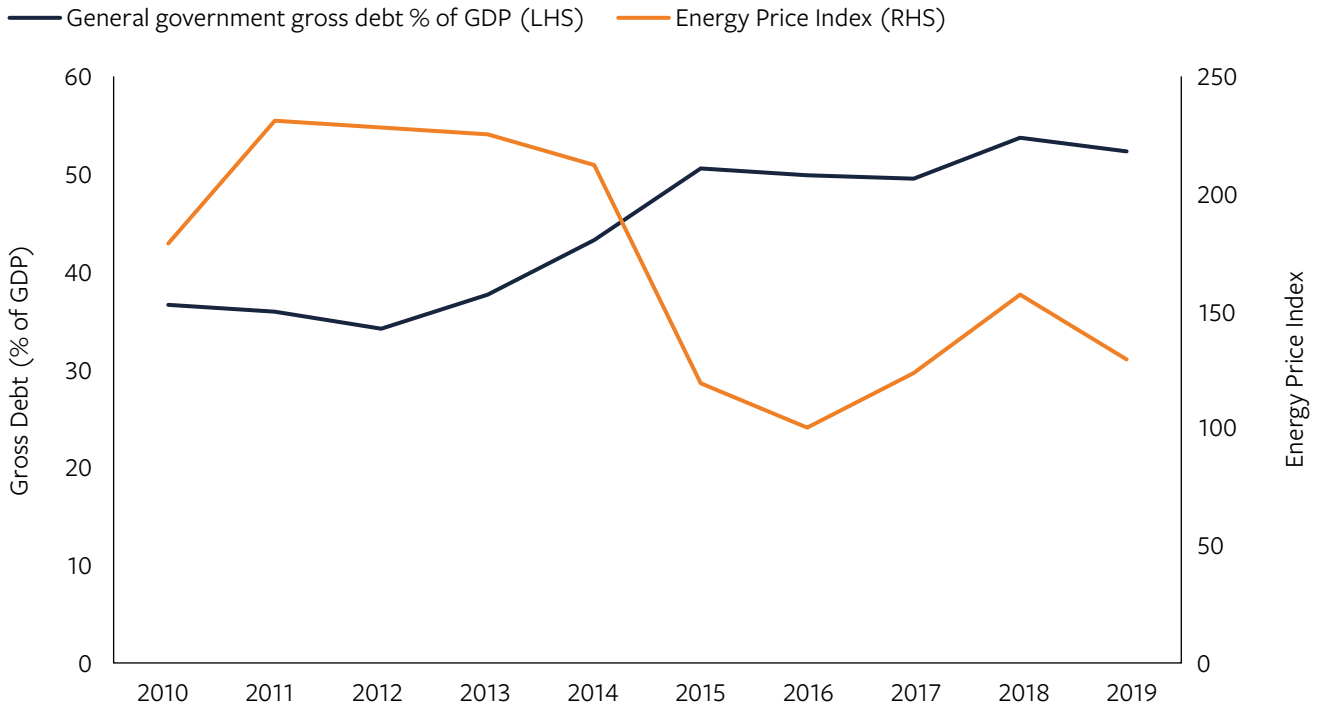
Source: UNU-WIDER Government Revenue Dataset (GRD); IMF Primary Commodity Price System

Colombia's fossil fuel dependence is also tempered by rapid growth outside of the fossil fuel sector. GDP growth has been steady at around 3% to 5% annually (except for 2020, during the Covid-19 pandemic) with medium-term annual growth expected to be 3.5% (IMF, 2022). This reflects a well-regarded administration with 'very strong' policy frameworks and institutions (IMF, 2022). Prudent public financial management has helped decouple government expenditure and fossil fuel prices.

### Level of debt

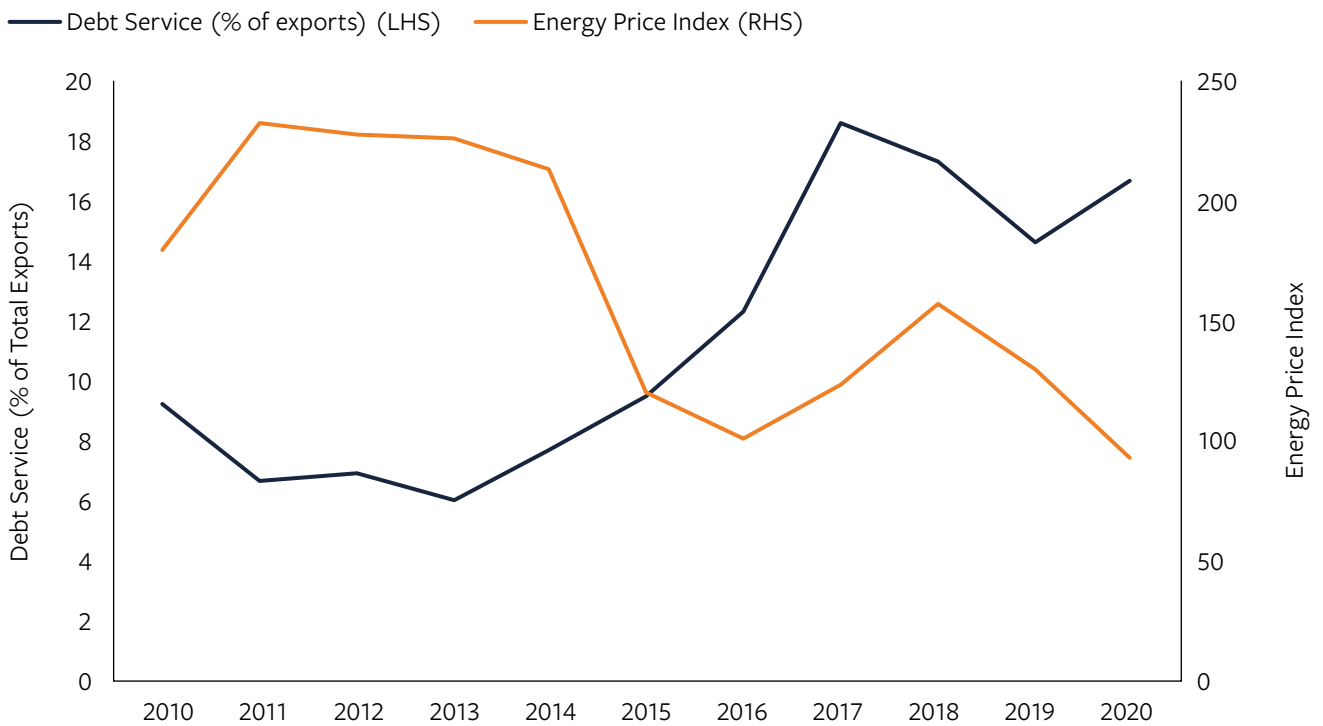
At the beginning of the sample period, in 2010, Colombia's public debt was 37% of GDP. This rose to 50% in 2015, during the period of the oil price fall, and increased further to 52% by 2019 (Figure A1.6). Debt service followed this, growing from about 6% of exports in 2013 to 19% in 2017 and 17% in 2020 (Figure A1.7). These debt levels are considered modest and sustainable, and debt is expected to fall as government revenues rise due to increased oil and gas prices since 2021 (IMF, 2022).

**Figure A1.6** Gross debt as percentage of GDP (2010–2020)



Source: IMF World Economic Outlook; IMF Primary Commodity Price System

**Figure A1.7** Debt service as percentage of exports (Colombia 2010–2020)



Source: World Bank International Debt Statistics; IMF Primary Commodity Price System



## Commitments to reducing dependency

Colombia has adopted a ground-breaking approach to climate change and its fossil fuel sector. The socialist government elected in June 2022 has prioritised tackling the degradation of Colombia's biodiversity and its vulnerability to climate change (which includes risks of flooding, landslides and water shortages affecting agriculture, health, economic activity and critical infrastructure including hydropower) (World Bank, 2022a).

The government plans to wean Colombia off fossil fuel dependency through a 'Just Transition', decarbonise to diversify its economy, and to implement nature-based solutions. In November 2020, it announced updated NDCs including preserving 30% of its territory as a protected area, reducing greenhouse gas emissions by 51% by 2030 and transitioning to a carbon-neutral economy by 2050. Plans to do this include a 10-year strategy to invest \$200 million to achieve zero net deforestation by 2030, a green energy transition plan and an enhanced carbon tax offset mechanism. The government has enacted new laws relating to clean transport, environmental crime, energy transition, climate action and decarbonisation (Garavito and Thanki, 2022; World Bank, 2022a; World Bank, 2022b; USAID, 2022).

Colombia is receiving significant support from development partners to finance these ambitious plans. The UK and KfW are supporting nature-based solutions, AFD is assisting in green livelihood development and USAID is supporting green energy development (USAID, 2022). In 2021, Colombia mobilised private finance through Latin America's first green bond. The World Bank provided technical advice to establish green taxonomies and environmental, social and governance (ESG) standards – both critical to support for green bond market development (Tyson, 2021; World Bank, 2022a). Private capital has been mobilised for green infrastructure development through public-private partnerships supported by blended finance from the World Bank (World Bank, 2022b).

In August 2022, the government expressed interest in a debt-for-nature swap to fund preservation of its tropical rainforests. Colombia has more than \$54.4 million of such exchanges with the US and Canadian governments, including under the US 1998 Tropical Forest Conservation Act (TFCA). These have been successful in raising finance for conservation while also providing debt relief, but the absolute amount remains relatively small, other debt relief programmes have been favoured over debt-for-nature swaps and there have been concerns about their effectiveness in terms of conservation outcomes (OECD, 2007; Congressional Research Service, 2018). It remains to be seen whether further finance can be mobilised through debt-for-nature arrangements.

Plans to raise domestic taxes and abolish petrol subsidies have met with significant public resistance. In 2018, the government tried to abolish VAT exemptions on basic foodstuffs, which then had to be reduced due to civil unrest to such an extent that it was revenue neutral. In 2021, there was significant civil unrest relating to tax reform, and the proposals were again withdrawn. Poverty and corruption fuel popular anger, especially among young Colombians. Roadblocks erected by protesters in response to rising fuel prices led to shortages of food, medicine and vaccines during the Covid-19 pandemic, and there were sharp reductions in crude oil output and a consequent fall in government revenues (IMF, 2022; Long, 2021a). While

the government has proposed increased levies on oil companies, an end to tax-deductibility for royalty payments and a ban on new oil drilling licences, this has been resisted by oil firms and lobbying groups, which have threatened to end investment and reduce production (Daniels, 2022; Kraul, 2021).

These policies have damaged Colombia's access to international capital. Unlike most Latin American nations, Colombia has not defaulted on its debt since the 1930s and has held investment grade status since 2011. However, in 2021, in the face of the government's fiscal reforms, its debt was downgraded to non-investment grade, making it harder and more expensive to access the Eurobond market (Long, 2021a; Long, 2021b).

Overall, the new government's policy approach to climate, debt and weaning the country off fossil-fuel dependency may prove a model for others. Colombia also illustrates how the fundamentals of a robust and diversified economy, strong institutions and moderate debt provide an enabling environment for moving away from fossil fuel dependence. However, recent experience also highlights that such change is likely to meet resistance from the public, the fossil fuel industry and financial markets. It is not yet clear how these challenges will be tackled.

### **A1.3 Kazakhstan**

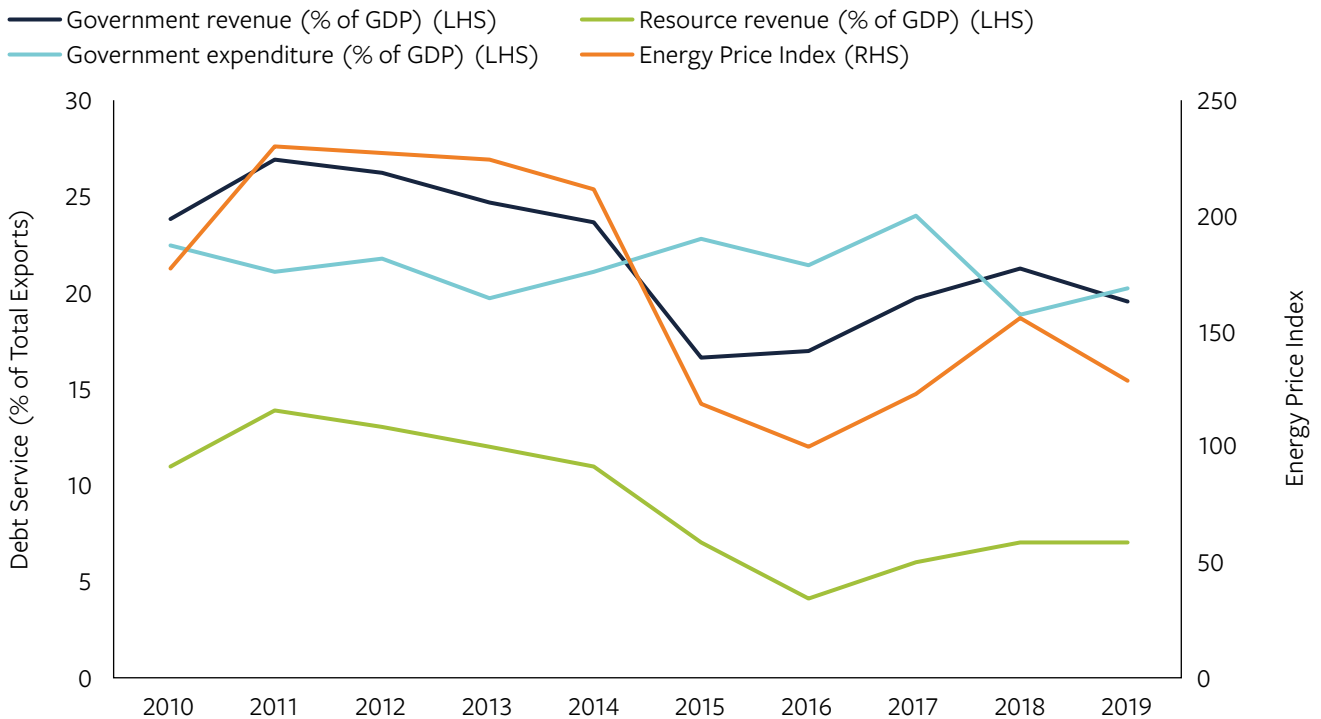
#### Nature and degree of dependency

Kazakhstan is a major producer of fossil fuels, including coal, crude oil and natural gas, and is the largest oil producer in Central Asia (IEA, 2020). It is also a major exporter. As of 2018, it was the ninth and twelfth largest crude oil and natural gas exporter in the world, respectively (IEA, 2020). Around 80% of Kazakhstan's oil is exported, accounting for most of the country's export earnings. It is also the main source of government revenue (IEA, 2022).

Kazakhstan has seen substantial GDP growth since the early 2000s (EBRD, 2018). This growth was boosted by the development of its large hydrocarbon resources and a boom in oil prices (World Bank Group, 2022). By 2017, Kazakhstan had accumulated national savings of around 40% of GDP in a sovereign wealth fund, the National Fund of the Republic of Kazakhstan (NFRK), established in 2000 to direct revenue from hydrocarbons for economic stabilisation and diversification (EBRD, 2018). Diversification is limited and growth is mostly dependent on natural resource rents and domestic consumption (World Bank Group, 2022). The country is vulnerable to price volatility in oil and gas markets, and trends such as falling commodity prices will have a large impact on the economy (World Energy Council, 2022).

Revenue closely follows energy prices (Figure A1.8). In 2010, at the beginning of the sample period, the government's total revenue, and resource revenue, as a percentage of GDP, were 24% and 11%, respectively. These peaked in 2011, where revenue as a percentage of GDP was 27% and resource revenue was 14%, which corresponds to the peak in the Energy Price Index during the period. As energy prices fell between 2014 and 2016, revenue as a percentage of GDP fell from 24% to 17%, and resource revenue fell from 11% to 4%.

**Figure A1.8** Government revenue, resource revenue and expenditure as a percentage of GDP and Energy Price Index, 2010–2020



Source: IMF World Economic Outlook; UNU-WIDER Government Revenue Dataset (GRD); IMF Primary Commodity Price System

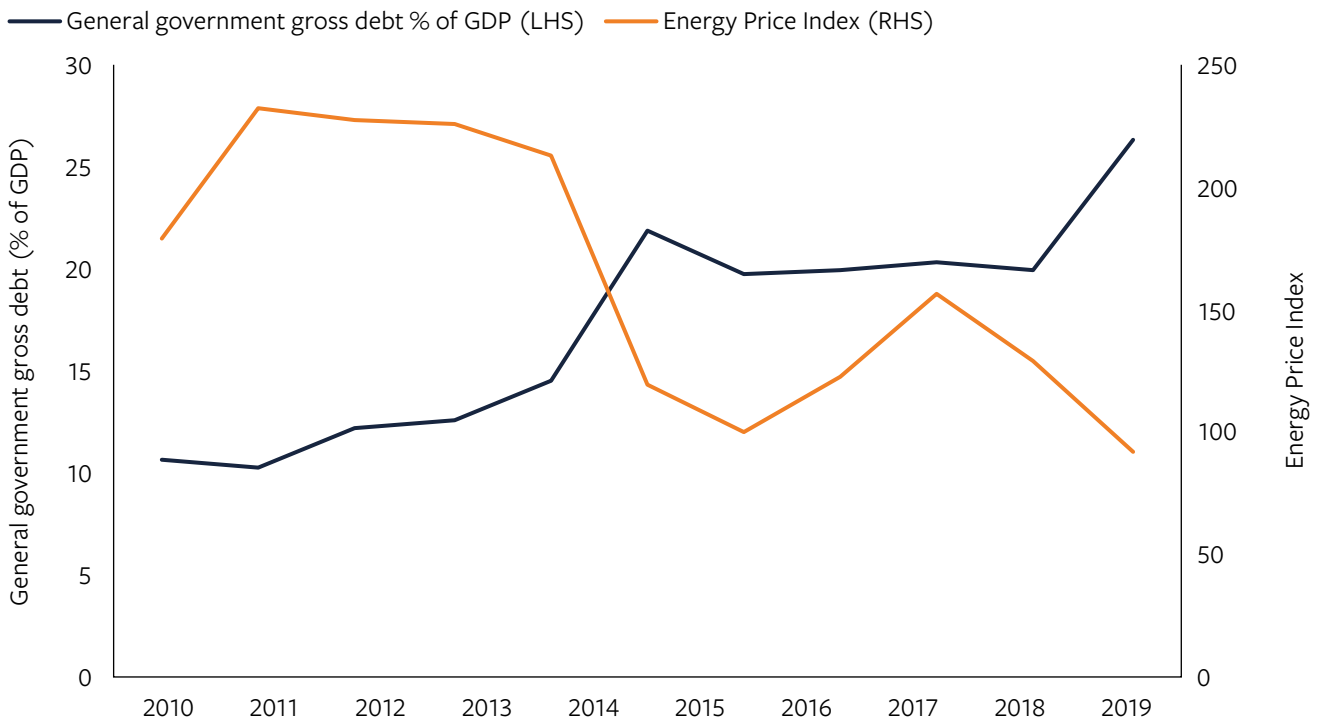
Following the decline in oil prices in 2014, Kazakhstan's expenditure did not fall as much as its revenue. From 2014 to 2015, expenditure increased from 21% of GDP to 23%, fell from 23% to 22% in 2016 and increased again in 2017, to 24%. In response to falling oil prices, the government put a fiscal consolidation programme in place consisting of a KZT 611 billion (\$3.3 billion) cut to the government budget, financed by postponing non-priority investment and freezing public sector salaries (EBRD, 2018). However, the cut was offset by a KZT 339 billion disbursement from the NFRK on the Nurlı Zhol programme (EBRD, 2018).<sup>19</sup> Expenditure increased as energy prices fell again between 2018 and 2019, due to Kazakhstan's fiscal response to the Covid-19 crisis (World Bank, 2020).

<sup>19</sup> The Nurlı Zhol programme was introduced in 2015, as one of several multi-year fiscal initiatives (IMF, 2017). It focused on supporting construction and funding infrastructure, and the lagged effects of this spending were likely seen in 2017 (IMF, 2017).

## Level of debt

At the beginning of the sample period, in 2010, Kazakhstan’s gross debt as a percentage of GDP was 11% (Figure A1.9). Debt rose steadily in most subsequent years until the oil price crash, which triggered a steep increase from 15% in 2014 to 22% in 2015. The increase in debt was due in part to a \$4 billion Eurobond issue combined with multilateral borrowing, in support of the 2015–2017 Partnership Framework Arrangement (PFA) programme under the ‘Kazakhstan 2050’ development strategy (World Bank, 2015). The government launched a plan for fiscal consolidation, with the aim of reducing overall government debt in the medium term and keeping the debt stock stable (World Bank, 2015).

**Figure A1.9** Gross debt as a percentage of GDP and Energy Price Index, 2010–2019



Low oil prices affected the ability of Kazmunaygaz (the state-owned oil and gas company) to meet its debt repayment schedule, and the government allocated \$2.7 billion from the NFRK in June 2015 to finance external debt payments (World Bank, 2015). To ensure the sustainability of the NFRK, in 2016 transfers from the fund were limited and the minimum balance of the fund was significantly increased (EBRD, 2018). However, under adverse shocks the new rule may be counter-productive as the cap on transfers could force the government to borrow at higher costs than the return from NFRK savings (IMF, 2022). At the same time, debt financing is restricted by poor sovereign debt ratings (EBRD, 2018) because of Kazakhstan’s reliance on oil and the risk of price changes (EBRD, 2018). Therefore, it is important that Kazakhstan broadens its revenue base to build fiscal buffers and improve budget resilience (World Bank Group, 2022).

## Diversification and reducing dependency

The government has recognised the need for long-term economic diversification and has introduced several fiscal policy reforms (EBRD, 2018). Corruption is a deterrent to private investment that the country needs to help reform its rigid business climate (Wheeler, 2017). The lack of skilled labour is also a barrier to diversification, along with misaligned economic policies, insufficient regulation of the financial sector and weak institutions (Esanov, 2012). Kazakhstan is developing a long-term decarbonisation strategy to bring utility tariffs closer to cost recovery, both to incentivise resource saving behaviour and to encourage private investment in renewables (EBRD, 2022). There are also plans to significantly improve political and economic governance, boost fixed capital investment and foreign direct investment and introduce new counter-cyclical budgetary rules (EBRD, 2022).

## Appendix 2 Country selection and data

**Table A2.1** Top countries based on each indicator

Country ranking	Indicator:					
	Fuel exports as a share of merchandise exports (2017)		Oil rents as % of GDP (2018)		Natural gas rents as % of GDP (2018)	
1	Angola	97%	Kuwait	45%	Timor-Leste	57%
2	Algeria	96%	Iraq	44%	Turkmenistan	14%
3	Iraq	96%	Libya	42%	Brunei Darussalam	14%
4	Brunei	92%	Congo, Rep.	42%	Uzbekistan	10%
5	Nigeria	92%	Iran	31%	Papua New Guinea	6%
6	Azerbaijan	90%	Saudi Arabia	29%	Trinidad and Tobago	6%
7	Libya	88%	Oman	27%	Equatorial Guinea	5%
8	Qatar	86%	Angola	26%	Qatar	5%
9	Equatorial Guinea	83%	Azerbaijan	25%	Mozambique	4%
10	Kuwait	79%	Equatorial Guinea	23%	Iran	4%
11	Chad	78%	Chad	20%	Azerbaijan	4%
12	Saudi Arabia	77%	Gabon	20%	Myanmar	4%
13	Gabon	71%	United Arab Emirates	17%	Russia	4%
14	Iran	70%	Algeria	16%	Malaysia	3%
15	Kazakhstan	63%	Kazakhstan	16%	Algeria	3%
16	Timor-Leste	63%	Qatar	16%	Oman	2%
17	Oman	61%	Timor-Leste	15%	Bahrain	2%
18	Russia	59%	Brunei Darussalam	12%	Bolivia	2%
19	Turkmenistan	59%	Bahrain	11%	Kazakhstan	2%
20	Congo, Rep.	57%	Russia	10%	Nigeria	1%
21	Venezuela	54%	Turkmenistan	10%	Congo, Rep.	1%
22	Colombia	52%	Nigeria	9%	Libya	1%
23	Trinidad and Tobago	49%	Ecuador	7%	Egypt	1%
24	Yemen	46%	Suriname	6%		

Note: 2017 and 2018 data are used due to lack of updated data for some countries.

Source: UNCTADStat and World Bank

**Table A2.2** Countries shortlisted based on three indicators

Country	Country	Country
1 Angola	13 Gabon	25 United Arab Emirates
2 Algeria	14 Iran	26 Bahrain
3 Iraq	15 Kazakhstan	27 Ecuador
4 Brunei	16 Timor-Leste	28 Suriname
5 Nigeria	17 Oman	29 Egypt
6 Azerbaijan	18 Russia	30 Uzbekistan
7 Libya	19 Turkmenistan	31 Papua New Guinea
8 Qatar	20 Congo, Rep.	32 Mozambique
9 Equatorial Guinea	21 Venezuela	33 Myanmar
10 Kuwait	22 Colombia	34 Malaysia
11 Chad	23 Trinidad and Tobago	35 Bolivia
12 Saudi Arabia	24 Yemen	

**Table A2.3** Final shortlist showing countries, region and income classification

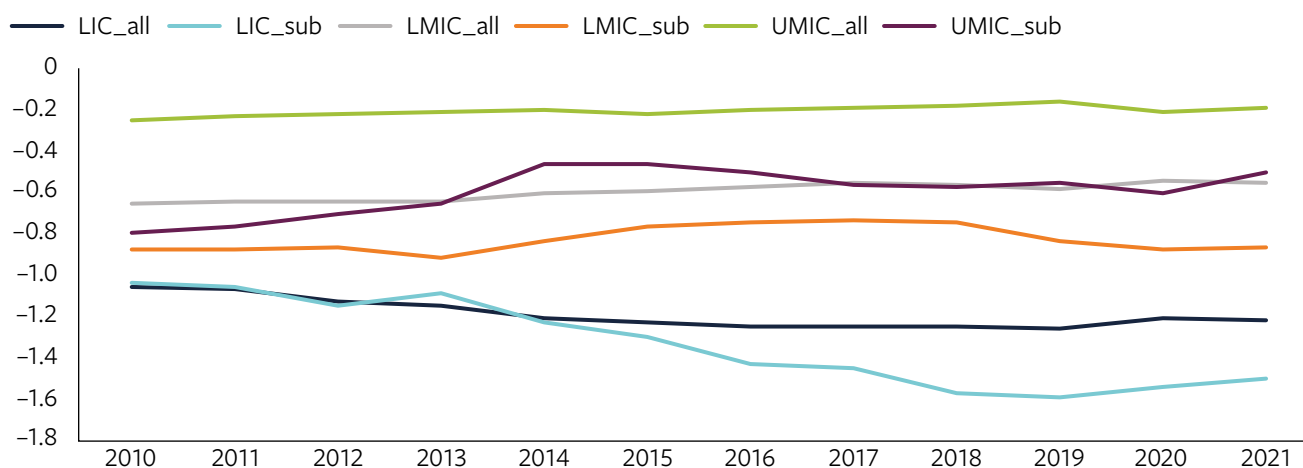
Country	Region	Income Classification
Algeria	Middle East and North Africa	Lower-Middle Income
Angola	Sub-Saharan Africa	Lower-Middle Income
Azerbaijan	Central Asia	Upper-Middle Income
Bolivia	Latin America and the Caribbean	Lower-Middle Income
Chad	Sub-Saharan Africa	Low Income
Colombia	Latin America and the Caribbean	Upper-Middle Income
Congo, Rep.	Sub-Saharan Africa	Lower-Middle Income
Ecuador	Latin America and the Caribbean	Upper-Middle Income
Egypt	Middle East and North Africa	Lower-Middle Income
Gabon	Sub-Saharan Africa	Upper-Middle Income
Iran	Middle East and North Africa	Lower-Middle Income
Kazakhstan	Europe and Central Asia	Upper-Middle Income
Mozambique	Sub-Saharan Africa	Low Income
Myanmar	East Asia and Pacific	Lower-Middle Income
Nigeria	Sub-Saharan Africa	Lower-Middle Income
Papua New Guinea	East Asia and Pacific	Lower-Middle Income
Timor-Leste	East Asia and Pacific	Lower-Middle Income
Turkmenistan	Europe and Central Asia	Upper-Middle Income
Uzbekistan	Europe and Central Asia	Lower-Middle Income
Venezuela	Latin America and the Caribbean	Upper-Middle Income
Yemen	Middle East and North Africa	Low Income

## Appendix 3 Trends in the broader governance environment between 2010 and 2021

Given the limited time series of the Natural Resource Governance Index, we use the World Bank's Government Effectiveness indicator to capture the broader governance context. This measures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of a government's commitment to such policies. Countries are ranked from -2.5 (less effective) to 2.5 (more effective).

Using government effectiveness as a broader measure of the governance context shows three important trends. First, comparing the average score for our sample of 21 countries (LIC\_sub, LMIC\_sub, UMIC\_sub) with the average for all countries in the corresponding income group in Figure A3.1 shows that countries highly dependent on fossil fuels tend to have weaker governance across all income groups. Second, except for Yemen, for which the indicator deteriorated significantly following the onset of civil war in 2014 (driving the decline in 'LIC\_sub' average), the change in the other two LICs was relatively minor. Third, except for Venezuela, government effectiveness appears to have improved in all six UMICs, the most notable being Azerbaijan, where the score increased from -0.8 in 2010 to 0.2 in 2021. Performance among LMICs was mixed, with notable improvements in Uzbekistan and Timor-Leste, and declines in Iran and the Republic of Congo.

**Figure A3.1** Government effectiveness (-2.5 to 2.5), 2010–2021

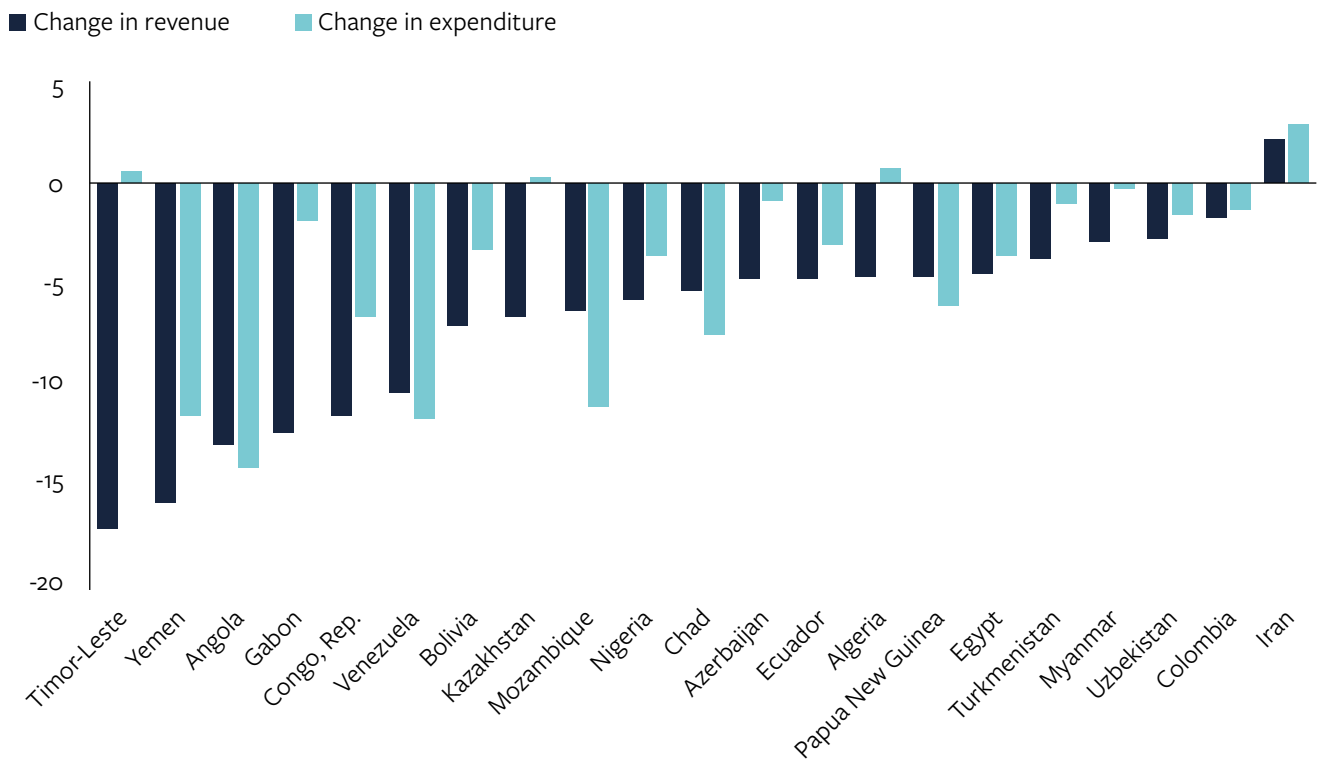


Source: World Bank Worldwide Governance Indicators



# Appendix 4 Fiscal outcomes

**Figure A4.1** Changes in revenue and expenditure, 2014–2016



**Table A4.1** Oil and gas rents in 19 report sample countries (2010–2020, US\$ million)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Algeria	41,856	61,535	62,112	57,763	51,075	25,899	18,839	23,882	32,096	27,822	17,060
Angola	32,521	44,614	44,954	40,739	32,173	9,100	5,188	11,039	21,090	17,806	13,303
Azerbaijan	16,954	23,106	21,733	19,924	17,195	7,661	5,758	8,436	13,749	12,182	7,899
Bolivia	1,039	1,715	2,098	2,406	2,045	1,053	703	898	1,351	967	645
Chad	2,250	3,133	2,765	2,399	2,426	824	681	1,477	2,302	2,013	1,214
Colombia	13,041	23,234	23,421	23,793	20,765	8,377	5,421	8,621	13,526	12,345	7,383
Congo, Rep.	5,862	8,403	7,619	6,089	5,326	1,709	1,456	3,217	5,963	5,421	3,462
Ecuador	7,855	12,376	12,136	11,960	11,317	4,337	3,226	5,193	7,726	7,158	4,375
Egypt	18,727	27,768	28,479	27,434	24,153	12,592	8,992	11,623	16,830	14,602	9,368
Gabon	4,291	6,452	5,922	5,171	4,296	1,466	1,338	2,450	3,433	3,457	2,202
Iran	107,424	169,019	145,877	130,729	123,263	63,049	60,785	85,279	116,583	72,985	49,398
Kazakhstan	26,421	40,268	38,920	36,873	32,424	14,197	10,946	18,526	30,956	27,505	17,661
Mozambique	338	621	714	669	721	473	261	383	666	488	297
Myanmar	7	11	852	1,558	2,013	2,307	1,427	1,572	2,650	2,139	1,507
Nigeria	50,258	74,844	71,743	61,122	54,413	19,187	13,359	26,013	43,557	37,528	22,397
Papua New Guinea	579	834	755	776	1,570	1,659	1,232	1,494	2,122	1,825	1,343
Turkmenistan	6,872	12,807	13,604	12,989	10,872	6,447	4,261	6,279	9,796	7,906	-
Uzbekistan	5,441	8,167	8,336	8,722	6,405	3,937	2,456	3,812	5,993	4,914	2,925
Yemen	7,179	8,491	6,740	5,494	4,747	871	229	485	984	-	-

Source: World Bank Data Bank

Note: Excludes Timor-Leste and Venezuela

Scale (for each country): Green (high) – yellow/orange (medium) – red (low)

**Table A4.2** Servicing on external debt in 19 report sample countries (2010–2020, US\$ million)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Algeria	676	640	855	537	300	691	357	240	217	195	175
Angola	2,962	3,922	6,055	5,868	8,328	8,644	10,973	9,181	11,046	11,891	8,533
Azerbaijan	414	1,117	1,293	1,939	1,873	1,907	1,764	2,233	2,682	2,160	1,839
Bolivia	656	447	651	550	984	994	776	979	1,007	1,079	1,176
Chad	73	83	84	120	589	113	161	183	103	89	114
Colombia	9,780	10,253	15,380	10,075	15,112	14,237	15,845	22,373	24,440	19,228	21,712
Congo, Rep.	121	131	171	437	488	416	361	415	476	547	721
Ecuador	1,746	2,404	2,640	3,144	4,021	5,099	5,381	6,617	9,145	9,388	9,296
Egypt	3,065	3,744	3,241	3,433	6,000	3,779	6,632	6,695	8,555	9,008	13,785
Gabon	453	420	426	1,161	523	471	372	624	722	700	1,413
Iran	1,808	1,654	599	439	511	729	2,086	490	194	334	328
Kazakhstan	39,475	32,449	23,206	30,931	31,177	34,857	20,246	27,934	33,654	32,781	30,788
Mozambique	196	507	319	467	607	979	1,144	1,382	1,946	1,993	1,113
Myanmar	242	217	1,154	2,460	620	502	740	644	833	695	599
Nigeria	1,257	525	1,337	495	4,546	1,602	2,492	3,530	5,368	5,131	5,543
Papua New Guinea	812	1,184	483	1,264	1,169	1,098	3,318	2,786	2,779	2,363	1,306
Turkmenistan	199	259	307	444	1,562	1,474	1,517	1,730	1,833	2,161	2,093
Uzbekistan	617	620	691	699	881	1,247	1,369	1,906	1,011	2,642	3,216
Yemen	257	275	255	271	363	358	139	99	111	115	135

Source: World Bank Data Bank

Scale (for each country): Green (low) – yellow/orange (medium) – red (high)

**Table A4.3** Percentage change in long-term debt stocks by creditor type (2010–2020)

Country	Public and publicly guaranteed debt		Private non-guaranteed debt
	Official creditors: multilateral and bilateral	Private creditors: bondholders, commercial banks, others	
Algeria	-28%	-100%	-76%
Angola	124%	231%	62%
Azerbaijan	173%	222%	-47%
Bolivia	250%	8,483%	1%
Chad	-16%	7,475%	-
Colombia	89%	164%	172%
Congo, Rep.	290%	-38%	-
Ecuador	161%	1,326%	111%
Egypt	119%	757%	648%
Gabon	216%	107%	-
Iran	-85%	-97%	-
Kazakhstan	111%	-	18%
Mozambique	188%	1,234%	553%
Myanmar	36%	155%	-
Nigeria	296%	-	202%
Papua New Guinea	314%	1,415%	175%
Turkmenistan	212%	-	595%
Uzbekistan	358%	807%	217%
Yemen	5%	-	-

Source: World Bank International Debt Statistics

Note: Timor-Leste and Venezuela are excluded due to missing data.