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Choices for spending government revenue

New African oil, gas, and mining economies

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Abstract: This paper examines a broad range of opportunities for addressing the pressing human development needs of low-income countries by using new oil, gas, and mineral discoveries. It assesses how much of an impact can be made on the funding gaps for health and education by new oil and gas revenues, and what other uses of those revenues are likely to arise. The paper argues that there is a strong case for investing natural resources revenues in social sectors, as they provide an opportunity to help to close the financing gaps in the African countries examined. However, the paper also highlights that the political economy risks of this revenue stream are higher than for other types of revenues. Finally, it illustrates how a simple diagnostic framework can be used to help to guide social sector investment decisions in the light of new natural resources revenues.

Keywords: extractives, education, framework, health, revenue, social protection

JEL classification: I15, I18, I22, I25, I28, I38

Acknowledgements: We use estimates produced by Haglund et al. (2015) showing the likely timing and magnitude of revenues from new discoveries of oil, gas, or minerals in six African countries, and innovative research by Barca et al. (2015) and Witter et al. (2015a) exploring the potential of new resources revenues to improve health and education services and social protection.

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1 Introduction¹

Extractives projects have the potential to contribute to improved human development, but this is not guaranteed. It is well understood that translating natural resources into individuals living longer and healthier lives, gaining a good education, and having a decent standard of living requires strategic planning and policy choices based around individual country contexts.

Public spending of government revenues from extractives projects has the potential to enhance human development either directly or indirectly: a point that is spelled out fully by Roe and Round (2017). Direct routes include spending on health, education, or social protection, while indirect routes include spending on infrastructure or on various measures to enhance economic growth. Both spending channels being important, the balance of expenditure between the two depends on the country context and the expected time profile of natural resources revenues.

This paper focuses on what it could mean to use natural resources revenues for public spending in social sectors (health, education, and social protection). The case for investing natural resources revenues in social sectors is strong. It rests on the assumption that these sectors are given a high priority in national government development plans, especially in lower-income countries, and this spending has the potential to lead to high economic returns and the fulfilment of the human rights that are guaranteed by most constitutions. Here are some of the main channels for this potential impact:

- **Creating a better educated and healthier workforce that tends to be more productive, contributing to increased economic growth.** Health and skills are forms of human capital that determine the value of labour. Thus, raising health and education levels will lead to higher productivity. There are often positive externalities too: a 2001 report by the World Health Organization’s Commission on Macroeconomics and Health (WHO 2001) estimated that focused health services costing US\$27 billion a year could yield an increased economic output of US\$186 billion a year by extending the productive lifespans of millions of people in developing countries.
- **Developing domestic human capital to help sustain and improve growth through regional and global competition in industries besides extractive industries.** If African nations are able to provide education and skills to their young people, the African workforce could account for a significantly higher share of global consumption and production (McKinsey Global Institute 2010). The correlation between schooling and individual earnings is high in African countries, and a recent study in South Africa using an industry-level dataset found a similarly strong effect for average worker schooling levels on productivity (Burger and Teal 2014).
- **Capturing the ‘demographic dividend’.** A fall in infant mortality in high-mortality populations initially boosts population growth, slowing economic growth. However, fertility then decreases as families choose to have fewer children when they realize that the mortality rate has changed. Reduced child mortality and reduced fertility lead to a short-term increase in the ratio of working-age people (15–64 years) to dependent people (children and people aged 65 years and older), facilitating a higher input of workers per person and an increased level of GDP per capita (Jamieson et al. 2013).

¹ This section is based heavily on section 2 of Witter et al. (2015a).

- **Generating knowledge for the future and creating healthier populations.** Education is closely linked to health, as healthier children are more likely to attend school and have greater cognitive capacity for learning. Improved education is a powerful mechanism of income growth, which in turn allows for greater spending on health care (Jamieson et al. 2013). Better educated children and adults are also more informed, and so are in a better position to promote and protect their health, thus feeding into the virtuous circle (UNESCO 2014).
- **Capturing potential temporary macroeconomic externalities.** Healthier and better educated populations can generate, for example, higher savings rates and increased flows of foreign direct investments, bringing in new technology and thereby increasing trade and contributing to job creation (WHO n.d.). As health improves, life expectancies improve, and people start to save more for longer retirements. This leads to a temporary increase in the net national savings rate, which can improve investment and growth.
- **Building social cohesion and politically stable societies.** This is particularly important in post-conflict and fragile states (such as Sierra Leone, Liberia, and Mozambique—three of our case study countries). There is growing interest in the role of health systems as social institutions (Kruk et al. 2010). One line of this work focuses on how the design of a health system, and particularly its financing, conveys important social and political values of the state, such as inclusiveness and equity. A review of the evidence by Eldon et al. (2008) found that health sector activities in fragile states contribute to social cohesion.
- **Inclusive growth requires attention to low-income households.** A growing body of evidence (Barca et al. 2015) indicates the potential benefits of cash transfers (CTs), including tackling poverty in the short run, improving social cohesion, boosting local economies, and building human capital in the long term (DFID 2011; WHO 2011). Social cohesion is improved by reducing inequality and social tensions. Demand for health and education services is improved by reducing the stigma and stress of extreme poverty, while local economies are boosted through the multiplier effect of increased purchasing power. For example, a recent UN Food and Agriculture Organization (FAO) study has shown that in Ghana’s Livelihood Empowerment Against Poverty (LEAP) cash transfer programme, every dollar transferred to poor households had the potential to raise local income by a factor of 2.5 (FAO 2014).

One of the risks of natural resource revenue flows is their propensity to distract from results-driven questions (‘what do we want to achieve?’) and rather to focus on expense-driven questions (‘we have funds, what should we spend them on?’). Witter et al. (2015a) developed a framework that identifies the key questions that should inform investment decisions in the social sectors; they argue that the same framework can be used by governments to guide policy decisions in this space, irrespective of the price environment—i.e. falling or increasing prices.

In general, decisions regarding social sector expenditure should be based on a comprehensive diagnosis of the needs of the sector, which in turn is based on the development goals of the country. However, decisions regarding the use of natural resources revenues to invest in national priorities require an alignment of such investments against a realistic assessment of the scale, trends, and predictability of revenue flows.

2 Estimating revenues from extractives projects in Africa

Extractives revenues depend on international commodity prices, which have historically been volatile and notoriously hard to predict. For example, the sharp falls in oil and iron ore prices

during the second half of 2014 took most analysts by surprise. While it is generally considered likely that demand for oil, gas, metals, and other commodities will continue to increase over the coming decades due to the growth of emerging markets, there is much greater uncertainty around supply.

As is noted by Roe and Dodd (2017), the past 10–15 years have seen many low- and middle-income countries become more economically dependent on extractive industries. This tendency seems likely to continue, despite the recent falls in commodity prices.

A study by Haglund et al. (2015) estimated that in the case of Mozambique, Tanzania, Ghana, Uganda, Sierra Leone, and Liberia, recent discoveries of natural resources are expected to be significant. However, they will not have a transformational impact. Using commodity prices reflecting the 2015 environment, in absolute terms, extractives revenues in these countries are projected to range from an annual average of US\$144 million in Liberia to US\$2.6 billion in Uganda over the first ten years of production. In relative terms, they are projected to range from 1.9 per cent of GDP in Tanzania to 5.7 per cent of GDP in Liberia over the same period.

Furthermore, Haglund et al. (2015) estimated that revenues will take time to materialize in most countries. It can take up to ten years from discovery for production to start, during which time revenues accruing to the government are minimal, and then a further 7 to 12 years for production to reach its peak. In most cases, once revenues hit their peak, they will slowly decline over the next 50 years as resources run out.

Commodity prices have declined further since 2015 (Figure 1 shows the example of the oil price), when the Haglund study was completed, and this has almost certainly affected the estimated timing and scale of the figures presented in Haglund et al. (2015). However, the likely timing and broad scale of revenues from extractives in these countries still provide a solid basis for discussions about the policy choices facing governments in these and other natural resource-rich countries when it comes to public spending on social sector activities and investments. In fact, price fluctuations are one of the challenges of managing extractives revenues.

Figure 1: Europe Brent spot price FOB (dollars per barrel)



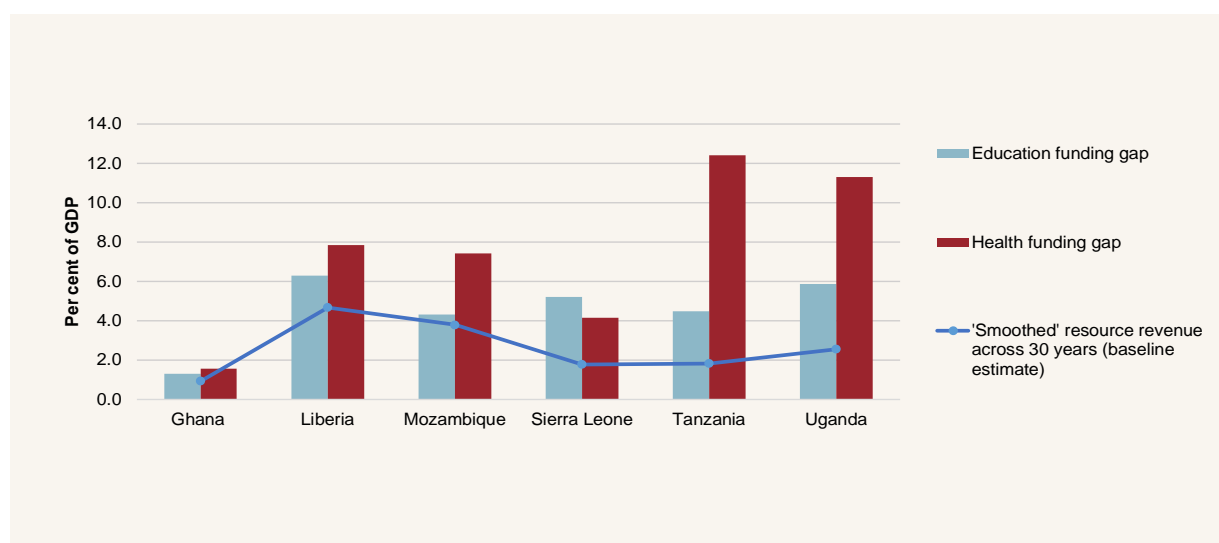
Source: US Energy Administration (EIA); <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RBRT&f=M>.

3 Comparison with spending gaps and current funding for social sectors²

A comparison of projected revenues from six countries with new extractive industries in Sub-Saharan Africa (Haglund et al. 2015) with estimated funding gaps for health³ and education gives an indication of the potential magnitude of what might be contributed by extractives revenues (Witter et al. 2015a). The different scenarios provide evidence that the scale of income from natural resources across selected African countries is in all cases sufficient to cover a significant part of the existing financing gaps in health and education (see Figure 2), but shows that the potential in each country is unique as both resources revenues and the size of the funding gaps differ.

Although the revenue estimates have since been downgraded, the overall picture is still illuminating. With a liquefied natural gas (LNG) price of US\$11 per million British thermal units (BTU), and with estimated projected revenues smoothed over the next 30 years, Mozambique, for example, could fund most of its education needs, or around a third of the country's need for financing in health, over the next decade. With a crude oil price of US\$60 per barrel, Ghana could meet about a third of its combined health and education funding needs over the next decade. In the same time period, Liberia could fill about a third of the combined health and education financing gap (with an iron ore price of US\$90 per dry metric ton).

Figure 2: Health and education funding gaps compared with smoothed natural resources revenues in the sample countries, annual average 2016–2025



Note: It appears that health funding gaps are larger than education funding gaps. This is partly due to the differing methodologies used to calculate gaps, which is related to available data on current spend and estimated needs for each sector and country.

Source: Witter et al. (2015a) and Haglund et al. (2015).

² This section is adapted from section 3 of Witter et al. (2015a).

³ To estimate gaps for health, projected resource revenues were compared with: (1) national health expenditures, based on national health expenditure accounts (NHA) data; (2) funding needs, using international recommendations from McIntyre and Meheus (2014), and estimated health funding gaps; and (3) other potential innovative health financing sources. On the expenditure side, we constructed a financial programming framework for each country that allowed us to project key economic variables such as growth and domestic revenue, and we used this to estimate resource availability for health.

Variations in oil, LNG, and iron ore prices will most likely impact the baseline, or mid-point, estimates presented above. Table 1 presents an overview of the variations that could be expected if the baseline price was shifted by +/- 25 per cent (for details see Haglund et al. 2015). In the low-price scenario—which is now closer to the realities post-2015—all sample countries could have natural resources revenues that are sufficient to cover between a tenth and a fifth of their country’s combined financing gaps in health and education—assuming that all revenues are allocated to social sectors.

Table 1: Price variations in smoothed resource revenue projections in relation to the combined health and education financing gaps

Sample country	New natural resources revenues as a share of total financing gaps in health and education	
	Low-price scenario	High-price scenario
Ghana	17.6	43.7
Liberia	18.1	65.5
Mozambique	15.6	49.4
Sierra Leone	0.0	36.7
Tanzania	5.4	17.4
Uganda	9.2	20.6

Source: Witter et al. (2015a) and Haglund et al. (2015).

It is important to keep in mind that the needs assessment is high, and is based on the assumption that spending to cover all needs would be possible immediately in both sectors. In reality it would take time to increase spending in both health and education, as absorptive and institutional capacity takes time to develop (not just training staff and building structures but also developing stronger systems to manage them).

3.1 Opportunities in the health sector

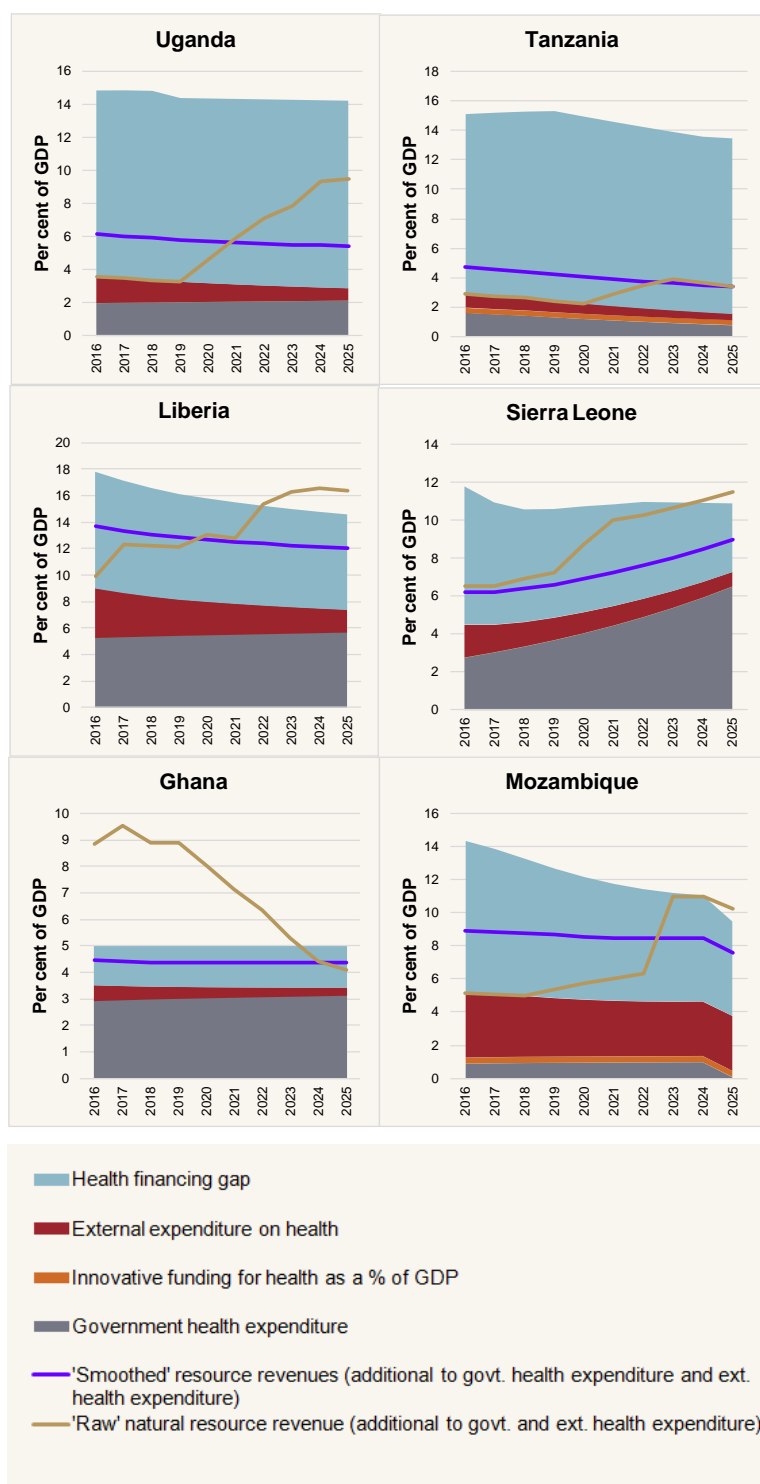
Analyses of projected natural resources revenues by country for the next decade show different profiles (Figure 3); the timing, magnitude, and relative importance vary across the six sample countries. In Ghana, Liberia, and Sierra Leone, for example, new resources revenues were already accruing to government in 2015, while in Mozambique, Uganda, and Tanzania revenues are not expected to flow for another four to six years (based on best estimates in 2015).

The graphs shown in Figure 3 give a sense of the changing picture in each country and how resources revenues could contribute to improve health services:

- In Ghana and Liberia⁴ health financing could be substantially supported by natural resources revenues. The scale of revenues in Ghana is already very high in relation to the various measures of health needs and expenditures; however, if the revenues are smoothed over the next 30 years (as a share of GDP), then just over half of Ghana’s health needs can be covered in the next decade.
- In Tanzania and Uganda, the health financing gaps are significant and natural resources revenues are estimated to only partly to contribute to those needs and, most likely, not before the early 2020s. However, smoothing revenues over the next 30 years (as a share of GDP) shows that both countries could cover around one-fifth of their health financing needs.

⁴ In the projections for natural resources revenues an attempt has been made to take account of the Ebola crisis in both countries.

Figure 3: Natural resources revenues compared with health sector financing gaps—profile over time by country⁵



Note: These graphs do not show the price sensitivity of the revenue predictions from Haglund et al. (2015).

Source: Witter et al. (2015a) and Haglund et al. (2015).

⁵ The decline in Liberia's and Mozambique's estimated health financing gaps as a share of GDP reflects the fact that both countries are expected to experience very rapid GDP growth over the next decade. This means that, although health financing needs in Liberia and Mozambique are expected to rise in absolute terms over this period, they are likely to fall as a share of GDP.

- Mozambique shows a significant dependence on donor funds, which could in fact not be replaced or supplemented by resources revenues for the next 5–10 years. However, looking at a scenario where revenues are smoothed over the next 30 years (as a share of GDP) reveals that there is the potential to cover around half of the funding gap in health over the next decade.
- Sierra Leone already has revenues flowing today and, if smoothed over the next 30 years (as a share of GDP), this could close almost half of the country’s health financing gap.

Price variations will, however, continue to impact the baseline, or mid-point, estimates presented above and in Figure 3. Table 2 presents an overview of the variations that are expected if the baseline price is shifted by +/- 25 per cent (for details of this analysis see Haglund et al. 2015). In Tanzania, higher prices result in the possibility that almost a quarter of the country’s health gap would be closed. By contrast, a lower price scenario in Sierra Leone could have a devastating impact, leading to cancellation of projects and a zero health contribution.

Table 2: Price variations in revenue projections in relation to the health financing gap

Focus country	New natural resources revenues as a share of the health financing gap	
	Low-price scenario	High-price scenario
Ghana	32.2	79.9
Liberia	32.6	117.8
Mozambique	24.6	78.2
Sierra Leone	0.0	82.7
Tanzania	7.3	23.6
Uganda	14.0	31.3

Source: Witter et al. (2015a) and Haglund et al. (2015).

Overall, the importance of new natural resources revenues as a possible source of funding for health is potentially large in the sample countries. Other ‘innovative’ sources of funding for health (such as taxes on remittances, mobile phone levies, and borrowing using domestic bonds for health) would be much smaller than natural resources revenues—even in the low-price scenario—in the two countries where we have estimates of such funding sources (see Figure 3).

It is also instructive to compare the projected funding from external donors for health (see Figure 3’s depiction of external expenditure on health) with the estimated natural resources revenues. Several sample countries cover a substantial part of their health sector spend using external funding; however, this is expected to decline in the medium term, creating a gap that natural resources revenues could close. The magnitude of potential natural resources revenues compared with donor funding is striking for all sample countries—in particular, we observe a cross-over pattern, with falling donor support and rising resources revenues. That said, we need to add a cautionary note and emphasize that both data series are best guesses, with considerable margins of error.

If we compare natural resources revenues with current government expenditure on the health sector, as opposed to the estimated health needs, which are much more ambitious, then their potential contribution to improvement in health services is even clearer.

3.2 Opportunities in the education sector

Similarly to the analysis of the health sector, the projected natural resources revenues by country for the next decade show different degrees of potential—in some cases more significant than others (Witter et al. 2015a). Table 3 shows a comparison between the projected natural resources revenues from 2016 to 2025 in the six sample countries and the estimated education financing gap

needing to be filled in order to achieve Education for All goals (i.e. providing schooling to all pre-primary-, primary- and secondary-aged children).⁶

Table 3: Price variations in revenue projections in relation to the education financing gap

Sample country	New natural resources revenues as a share of the education financing gap	
	Low-price scenario	High-price scenario
Ghana	38.8	96.2
Liberia	40.8	147.3
Mozambique	42.3	134.3
Sierra Leone	0.0	65.9
Tanzania	20.3	65.6
Uganda	27.0	60.3

Source: Witter et al. (2015a) and Haglund et al. (2015).

In Tanzania and Uganda, part of the projected financing gap could be covered by new natural resources revenues, and these revenues could be enough to achieve universal pre-primary and primary education in the high-price scenario. In the low-price scenario (with less available funding), either the financing gap in pre-primary education or about two-thirds of the financing gap needing to be filled to achieve universal primary education could be covered by these revenues. The situation in Sierra Leone is similar, but here a low-price scenario could mean cancellation of the extractives projects and thereby removal of any potential funding available for education.

In Ghana, Liberia, and Mozambique the situation looks different. Our mid-point estimates for the *total* projected new natural resources revenues in these three countries would be sufficient for between two-thirds and three-quarters of the financing gap to be filled, moving close to achieving school attendance for all pre-primary-, primary-, and lower-secondary-aged children. This would mean equipping schools with sufficient classrooms, employing one teacher for every 44 pupils, and providing the regional standard of learning materials, as well as covering the costs of achieving universal pre-primary education, providing subsidies and supplies to target marginalized pupils, and offering adult literacy programmes.

In the high-price scenario for Ghana, Liberia, and Mozambique, the total estimated financing gap in education could be closed, and in Liberia and Mozambique there would also be an opportunity to allocate funding to other areas. If all new natural resources revenues are allocated to education in this scenario, there would also be funding available to introduce dramatic improvements to the quality of the education that pupils receive. However, the low-price scenario shows that in that situation less than half of the financing gap could be filled.

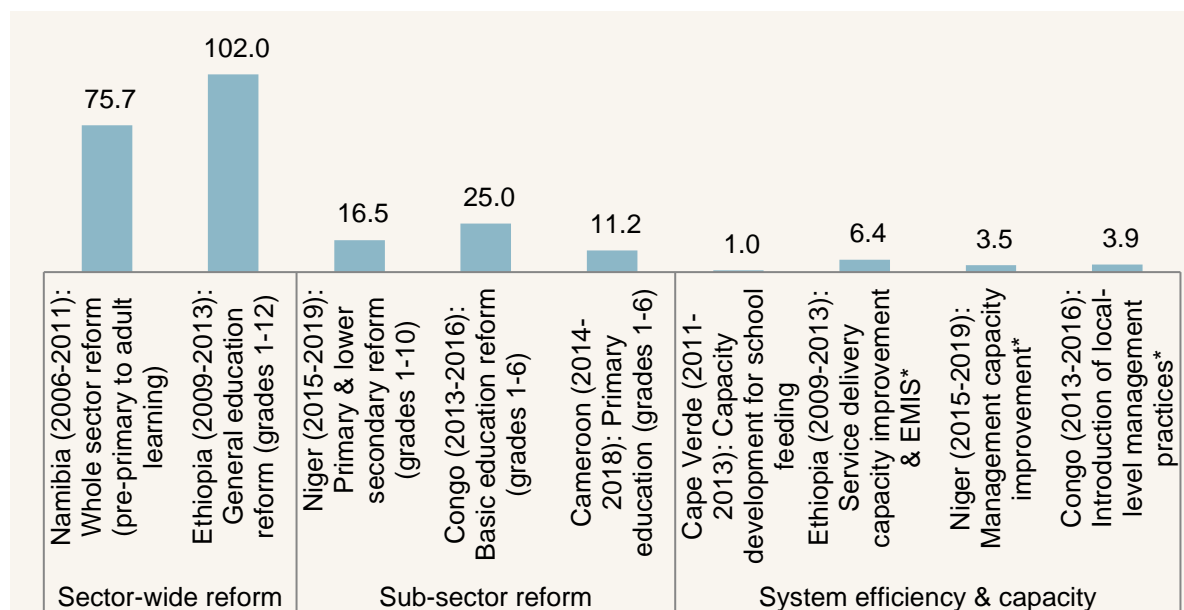
The current size of funds from private philanthropic organizations for education further highlights the potential contribution new natural resources revenues could make towards improvements in education. According to the Innovative Finance Foundation (2013), to date there has been only limited financial innovation in the global education arena.

The potential for education sector improvements to be funded by new resources revenues can be further and more specifically illustrated by examining recent reforms in comparable African countries (see Figure 4). While the reforms in question were costed for a four- or five-year period,

⁶ The estimates of financing gaps are based on a paper commissioned for the 2010 Education for All Global Monitoring Report (UNESCO 2010). The report calculates education financing needs based on projections of the number of school-age children; teacher salary and classroom construction costs; national targets for pupil-teacher and pupil-classroom ratios; and targets for the proportion of total recurrent costs to be devoted to non-salary spending. The cost of providing adult literacy programmes was also accounted for. Resources available for education were estimated on the basis of GDP projections and the ratio of public education spending to GDP.

annual figures are presented for ease of comparison. With varying beneficiary populations, these comprehensive system-wide reforms targeted both access and quality outcomes. They included teacher training, textbook development and/or distribution, information and communications technology strengthening, support for school management, and assessment reform.

Figure 4: Examples of annual costs of education sector reforms (US\$ million)



Note: (1) all figures in constant 2013 US\$ million; (2) costs marked with * are sub-components of sector- or subsector-wide reforms.

Sources: Namibia – Republic of Namibia (2007); Ethiopia – World Bank (2013); Niger – World Bank (2014a); Congo – World Bank (2014b); Cape Verde – World Food Programme (2013).

The most costly reform shown here—a large-scale programme to improve the quality of primary and secondary education in Ethiopia, with a population almost twice as large as the most populous of the sample countries⁷—was just under US\$510 million over five years (World Bank 2013). Costing approximately 7 per cent of the budget for the entire sector plan, this intervention aims to move from a focus on access towards improving quality (Federal Ministry of Education 2008, 2010). Its cost could comfortably be afforded from the projected natural resources revenues for each of the sample countries, assuming they faced similar costs to Ethiopia’s.

3.3 Opportunities in social protection⁸

Supply-side barriers in relation to health and education spending have been addressed above but outcomes will not improve unless certain demand-side barriers are also addressed. These barriers include poverty, lack of access, and lack of funds for specific social services. As discussed earlier, estimates carried out by Barca et al. (2015) showed that, if smoothed over 30 years, new natural resources revenues for the same sample countries were projected to approximate to the cost of a basic social protection package. Rough estimates and existing country data show that a basic national social assistance package (providing CTs to households in poverty to enable them to access essential social services) costs between 1 per cent and 5 per cent of GDP, exact costs

⁷ Approximate population figures (2015): Ethiopia 100m; Tanzania 53m; Uganda 39m; Mozambique 28m; Ghana 27m; Sierra Leone 6m; Liberia 4.5m.

⁸ This sub-section draws on findings from Barca et al. (2015).

depending on the mix and types of scheme adopted and the demographic profile of the target population (DFID 2011; UNICEF 2009). Only in a handful of southern African countries where extensive rights-based grant systems and social pensions have been developed does social assistance expenditure exceed 3 per cent of GDP (Gentilini et al. 2014; World Bank 2012).

It is not suggested that it would be realistic to use all future natural resources revenues for social protection—and governments need to be aware that once social protection schemes are set up they are politically difficult to reverse if money becomes tight. However, the comparisons once again provide a useful order-of-magnitude context. It is not unrealistic to consider spending some part of new natural resources revenues on social protection programmes characterized as recurrent public spending over a 30-year timeframe.

Even where the additional fiscal space generated by natural resources revenues is not sufficient to cover a full social assistance package, social protection can still be advanced as one possible use of those revenues. Natural resources revenues could, for example, cover CT start-up costs, while the government looks for other solutions—perhaps by saving revenues in a sovereign wealth fund, or investing them in strategies to diversify and grow the economy—to finance longer-term recurrent costs. One argument for explicitly linking new natural resources revenues to social protection schemes is that it gives citizens a direct interest in demanding accountability in respect of how the revenues are spent. To maximize their potential, CT programmes have been shown to benefit from close coordination among ministries of finance, health, education, and social welfare.

4 Policy choices: what to consider when spending natural resources in social sectors⁹

Witter et al. (2015a) ask the further question of whether the characteristics of extractives revenues result in unique implications for the prioritization of social spending. Table 4, which summarizes some of their results, shows that these characteristics may not in fact present significant changes to the normal decision-making required to effectively allocate public resources to, and spend them in, social sectors.

⁹ This section draws heavily on section 4 of Witter et al. (2015a).

Table 4: Revenue characteristics and their implications for social sector spending

	Core and likely characteristics of extractives revenues	Implications for social spending prioritization
1	Of medium-term duration (20–30 years)	Investments should create major additional costs only if projected growth rates suggest they can be maintained over the longer term
2	Non-renewable	The investments should benefit future generations as well as current generations
3	Of varying scale and time profile, with rapid scale-up in some cases	They should be capable of rapid introduction, and acknowledge the risk of potential scale-back
4	Volatile in amount and hard to predict, as extraction and world prices will vary over time and may be affected by shocks	Unless smoothing mechanisms can be found, the investments should focus on discrete interventions, such as systems strengthening and improved value for money, rather than recurrent costs
5	Associated with weaker accountability to the local or host nation population	Some part should be focused on local communities, who have also had the disadvantages of extraction. Attention should also be paid to creating transparency and accountability mechanisms

Source: Witter et al. (2015a).

Based on these results, a ‘diagnostic framework’ was developed which brought together what we know about new natural resources revenues, and also about the needs for funding, the systems constraints, and existing experiences across the social sectors, in order to discuss what approaches are likely to yield good results in low- and middle-income, often fragile, contexts.

A pre-condition for the application of the framework is that there is a willingness to invest in health, education, and social protection. Without this, the framework is redundant. The framework is ideally informed by existing plans for human development, based on the development goals of the country.

Decisions regarding the use of natural resources revenues to invest in national priorities require an alignment of human development investments against a realistic estimate of the scale, trends, and predictability of natural resources revenues. The scale of investments that will be made will depend on the ability to match the costs of investments against the expected revenue flows. Predictability is less straightforward as volatility is a consequence of the uncertainty of future resource prices and demand (Stevens et al. 2013).

However, the diagnostics framework is not only about the revenue flows. It also focuses on three other dimensions: the national context in the social sectors, the financing context for these sectors, and system diagnosis of social sectors. All four dimensions need to be analysed when making decisions regarding the allocation of funds to social sectors. It is important to note that the diagnostics framework does not provide guidance as to how governments should allocate funding *between* sectors—only within each social sector. The full framework is shown in Table 5.

Current public expenditure in the health and education sectors in the sample countries is skewed towards recurrent costs (Witter et al. 2015a). This indicates that natural resources revenues will need to support recurrent expenditure, as this constitutes the bulk of the sectors’ needs, even if strategies are used to increase the efficiency of the sectors and to support diverse delivery systems. For education, the range is from 73 per cent in Mozambique to nearly 99 per cent in Sierra Leone, and the bulk of this expenditure is absorbed by salaries (the only exception being Liberia, where

non-salary recurrent costs are slightly higher as a percentage). For health, the range is wider, going from 37 per cent in Liberia¹⁰ to 92 per cent in Ghana.

In what follows, the diagnostics framework has been applied, hypothetically, to the examples of Ghana and Sierra Leone: two countries where both the resource revenues and the health and education sectors look very different. Hence, conclusions derived using the diagnostics framework are different.

Table 5: Diagnostics framework—investing natural resources revenues in social sectors

Core question	Range of answers	Implications
Natural resource revenue characteristics		
Scale of expected resources	High (more than 60% of public social sector expenditure)	Can fund major new investments and/or restructuring, as well as core inputs
	Medium (20%–60% of public social sector expenditure)	Can fund core inputs and system strengthening
	Low (less than 20% of public social sector expenditure)	Can fund marginal improvements
Volatility of resources	Government able to smooth out volatility	Can take on expenditures which are recurrent
	Government not able to remove volatility	Better suited to funding capital investment and discrete reforms or system strengthening
Duration of resources	Short-term (5–10 years)	Cannot be used for recurrent expenditures, unless real GDP growth per capita is assumed to be strong at the end of the period
	Medium-term (10–30 years)	Can commit to longer-term investments
	Long-term (>30 years)	
National context		
Coverage of health and education systems	Established, mature health system which can be accessed by all, within WHO norms Established education system with universal access to early childhood and basic education	Focus on improving quality, efficiency, and equity, including through CTs, where relevant
	Health and education infrastructure still rudimentary or in recovery from wars and shocks	Focus on getting full coverage of basic services—infrastructure development, increased staffing, equipment, etc. During recovery focus on reconstruction and peace-building through inclusive health and education systems
Priorities established in a national plan	There is a medium-term expenditure framework, national health financing strategy, or education sector strategic plan	Fund priority areas within plan which are not yet supported by existing resources
	There is no medium-term expenditure framework, national health financing strategy, or education sector strategic plan	Conduct assessment, using tools like OASIS (in health) and Education Sector Review to establish priorities

¹⁰ It is possible that the post-conflict setting has generated the relatively higher investment costs in Liberia, but this does not hold true for its education sector, which should be equally affected.

Health and education financing context

Financial protection	Financial protection for health care expenditure is adequate (e.g. less than 20% of total health expenditure is out-of-pocket). Mechanisms are in place to offset household expenditure for the poor (e.g. household stipends or school grants)	Check for inequities (are all groups protected or does the average mask substantial differences?) Focus on improving quality of care, efficiency, and equity of access and utilization. CTs may be needed for excluded groups
	Financial protection is currently inadequate	Fund extension of universal health and education coverage, e.g. through increased public budget, funding to other risk pools, such as social health insurance and more effective public-private partnerships (franchising, social marketing, etc.)
Trends in other funding sources	The main other financial sources (e.g. government funding and external support) are likely to be maintained and increased over the period	Natural resources revenues can be seen as supplementary, and can focus on currently neglected areas (e.g. unfunded areas within the sector plan)
	The main other funding sources are projected to decline over the period	Natural resources revenues will need to substitute for current sources and will fund some of the existing commitments
Earmarking	Within government, there is a willingness to earmark funds	Natural resources revenues could be deposited within a social fund, to be used for priority areas—especially those which are harder to get external support for
	There is no willingness to earmark funds	Each year, the sector needs to present its case for additional funding
Bottlenecks in public finance	Health and education facilities receive adequate funding to cover essential salary and non-salary recurrent costs on a regular, reliable basis	Funds can be invested in the existing system, which is able to channel resources to front-line providers.
	Funds at facility or school level are not adequate, regular, or reliable	Consider reforming funding of facilities (using capitation or combination of input, output and quality measures)

System diagnosis of social sectors

System preparedness to meet new needs	The system is resilient to shocks and able to adapt to new needs	Funds should go to improving and extending the range of services, rather than to systemic investments
	There is evidence of lack of resilience and adaptability	Systemic investments are needed, including, possibly, re-organization, which can improve local stewardship (e.g. decentralization, increased autonomy), as well as developing supportive national systems
Areas of greatest need in terms of health and education system building blocks	Adequacy of indicators and performance of: <ul style="list-style-type: none"> - human resources - supplies and medicines - infrastructure and equipment - governance - service delivery - monitoring and evaluation 	Not all pillars can be supported simultaneously, so priorities need to be established using a systems diagnosis, if not already incorporated in sector plans, to establish reform and strengthening sequence
Community engagement and accountability	There are effective mechanisms for local communities to engage with the health and education systems and to ensure the systems respond to their needs	These mechanisms do not need additional support but can be used to monitor the use of natural resources revenues
	These mechanisms do not exist or are not effective	Some part of the natural resources revenues should be earmarked to support local planning and monitoring mechanisms

Non-state engagement	Private for-profit, not-for-profit, and informal sectors contribute to public goods, including for poorer households The non-state sector is not well aligned with public health and education policies	Natural resources revenues can be focused on funding or extending public provision Natural resources revenues can fund pilots relating to changing incentives for the non-state sector and testing new regulatory approaches
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Source: Adapted from Witter et al. (2015a).

4.1 The example of Ghana

The resources revenues

In Ghana, substantial investments in the health sector over the medium to long term could be covered by natural resources revenues, and the revenues could be smoothed to some degree. Ghana can therefore consider some transformative options, as well as gradually replacing donor funding, which is likely to fall over time and which has historically funded a number of ‘high-impact’ interventions. The build-up of natural resources revenues will be gradual, so absorptive capacity should not be a large concern.

In health

Ghana has a mature health system, with reasonable access in most areas. It has been extending financial protection through its National Health Insurance Fund (NHIF), which is largely VAT (tax) funded (Witter and Garshong 2009), but which faces a number of challenges to its sustainability, notably the need to control costs through the reform of provider payments and to either constrain the benefits package or increase the resources base. Natural resources revenues could be used to extend coverage to poorer households—the current definition of indigents is very restrictive—and to strengthen the currently limited purchasing function in the NHIF. As a middle-income country facing a growing burden of non-communicable diseases, Ghana might also choose to set aside a part of its natural resources revenues to boost promotive and preventive care, by increasing the capacity of community-based services like the country’s Community-Based Health Planning and Service (CHPS) to educate communities and stimulate behaviour change, while also developing public–private partnerships—for example, with employers to promote healthy lifestyles.

In education

While significant gains in enrolment, attendance, and completion rates have been made over the past two decades, the quality of education in Ghana is a key area of concern. In comparison with other African nations, Ghanaian pupils perform poorly on achievement tests, scoring well below those from South Africa, Morocco, Algeria, Botswana, Egypt, and Tunisia (Etsey et al. 2009). Part of the reason for this may be the high incidence of untrained teachers (this stood at 36 per cent in 2007 according to Management Information System for Education data¹¹). A recent US Agency for International Development (USAID) study found the number of untrained teachers to have an adverse effect on pupils’ English test scores in Ghana (Etsey et al. 2009). This is consistent with international studies which indicate that what teachers know, what they do, and how much they care account for greater variance in pupil achievement than any other policy-amenable variable. Ghana’s Education Strategic Plan 2010–2020 prioritizes interventions targeting access, quality, and

¹¹ Available at: <http://www.unesco.org/new/en/education/themes/planning-and-managing-education/policy-and-planning/emis/> (accessed 26 June 2017).

management. The strategy also targets science and technology as a priority area for improvement. In the first instance, natural resources revenues could be used to fund the current plan, with a focus on reducing inequality. With significant regional inequalities within the health and education sector, additional resources could be allocated to target the northern regions—for example, with the provision of allowances and training incentives for health workers and teachers in the area. Given the size of the projected natural resources revenues, a part could be allocated to testing and implementing teacher workforce reforms beyond those included in the plan, including high-quality teacher training.

4.2 The example of Sierra Leone

Resources revenues

The revenues are able to contribute significantly to both sectors, but the government is unlikely to be able to smooth expenditure and the absorptive capacity is lower than in Ghana.

In health

Sierra Leone's health system was devastated in the civil war of 1991–2002, and was only just starting to recover when the country was hit by the Ebola epidemic in 2014. All health system pillars require reinforcement, and the natural resources funds could contribute to a 'national health sector recovery fund' to support the upgrading of facilities and staff skills, packages to keep staff working in rural areas, and community programmes to raise awareness of health risks and restore confidence in the health system. National and regional capacity needs to be built to enable the devolvement of some important functions, such as staff recruitment and management (Bertone et al. 2014). Financial protection also needs to be extended. At present, some protection is provided to pregnant and lactating women and children under five by the Free Health Care Initiative, but other groups are still bearing high health care costs. Facilities receive some flexible funding quarterly through the performance-based financing programme, but these funds are not regular or reliable at present (Witter et al. 2015b).

In education

Like the health system, the education system in Sierra Leone was affected deeply by the civil war. Over 60 per cent of the country's education infrastructure was destroyed. Since then, major strides have been made in rebuilding the education system. Most notably, the country has seen a huge increase in the number of children enrolled in primary education following the introduction of free primary education in 2003. Despite these improvements, there is still some distance to go in providing access to all students, and improving standards and learning outcomes. Demographic pressure on the education system is set to increase, with the achievement of universal primary education by 2020 estimated to require a 56 per cent increase in the system's capacity (Government of Sierra Leone 2013). The government has devoted a large share of education resources to the primary level, more so than other low-income countries. However, the government spends around 3.5 per cent of GDP on education, which is low compared with most other low-income countries and other Sub-Saharan African countries. Successes at this level, however, have created pressure on higher levels of schooling. The Education Sector Plan 2014–2018 acknowledges this and has established goals and priorities in education subsectors beyond basic education. It also recognizes that with current levels of government resources and donor commitments there is a funding gap of about 15 per cent of the total required expenditure, not accounting for returns expected from natural resources (Global Partnership for Education 2013). Allocating natural resources revenues to bridge some of this gap could signal government commitment to meeting its stated goals.

4.3 Importance of addressing demand-side barriers, in conjunction with supply¹²

Cash transfers can help to tackle demand-side barriers to both health and education services—that is, to address the reasons why many people do not access those services (Barca et al. 2015). These barriers include indirect costs associated with accessing those services: for example, travel to hospital, school books and uniforms, and the opportunity cost of time not spent working. CTs can mitigate such costs. A combination of demand-side (CT) and supply-side (health and education) spending can be especially effective in boosting human development.

CTs can be specifically designed to encourage certain behaviours, such as attending health check-ups or sending children to school. This can be achieved through explicit conditionality. However, this can be costly to administer and results have also been achieved through ‘nudges’, such as: distributing the cash with information suggesting how it could be used; delivering cash at, for example, the start of the school year, when costs of uniforms and books arise; delivering the cash into the hands of a female household member; or even giving the programme a suggestive name, such as ‘child support grant’.

There is mounting evidence regarding the most effective ways to design CT programmes that are tailored to each country’s needs and fiscal space. Policy decisions include: whether to make CTs universal, or widely or narrowly targeted; the level at which they should be set (often at a meaningful but modest percentage of household budgets); the frequency of payment, with evidence pointing to the benefits of predictability; and whether it is possible to distribute the cash electronically, which has been shown to increase savings rates.

Introducing CT programmes is also in line with the recommendations set out by the African Union, which has been advocating the development of strategies for ‘introducing and extending public-financed, non-contributory cash transfers’ (African Union 2008). The possibility of supporting existing policy processes in this way is also an argument against distributing new natural resources revenues using a ‘direct dividend’ model: making payments to the population at large. This argument is supported by the size of revenues per capita in many countries (see Box 1).

¹² This sub-section draws on material in Barca et al. (2015).

Box 1: Direct dividend transfers

Why are direct dividend transfers less appealing than supporting existing social protection systems for Haglund et al.'s (2015) group of sample countries?

- Overall, it would be a missed opportunity not to support existing government initiatives and build on the know-how and systems developed in recent years by donors and governments alike. The existing 'social contract', social accountability frameworks (including grievance mechanisms and links to community committees), and monitoring and evaluation systems developed for the provision of social assistance would make accountability more effective than the setting-up of a parallel system; it would also contribute to the long-term sustainability of system investments.
- The size of natural resources revenues projected in Haglund et al. (2015) does not predict that any of our sample countries will become the next Angola or Gabon, where distribution of 10 per cent of annual natural resources revenues as direct dividends could eradicate half or more of their average depth in poverty¹³.
- A transfer to all citizens, irrespective of their poverty status or category, in our sample countries would result in very small amounts being distributed per citizen, drastically limiting transformative impacts and undermining the poverty-alleviation benefits of CTs. Based on the revenue projections in Haglund et al. (2015), we estimate that between US\$13 and US\$32 could be distributed to each family per quarter¹⁴ across our sample countries.¹⁵

These findings are similar to those reported by Giugale and Nguyen (2014). Assuming cost-free, perfectly targeted transfers are made by an all-knowing government in order to close natural resource-rich countries' poverty gaps, they show that most existing resource-rich countries would not be able to eradicate poverty even if they used all their natural resources revenues for this purpose. They conclude that the impact of direct dividends depends as much on the volume of natural resources as it does on demographics and the initial position of the national poverty line.

National CT programmes already exist in many African countries, including some that have made recent natural resources discoveries. Kenya, Mozambique, Ghana, and Uganda are among the countries in which programmes have already been developed and are in the process of being scaled up.

5 Concluding remarks¹⁶

- **There is a strong case for investing natural resources revenues in social sectors.** Such investments can create a better educated and healthier workforce that tends to be more productive; they can help to develop domestic human capital to sustain and improve growth, through regional and global competition in industries other than natural resources; they can lead to a 'demographic dividend', facilitating a higher input of workers per person and increased GDP per head; they can generate knowledge for the future; they can capture potential temporary macroeconomic externalities; they can build social cohesion and

¹³ As estimated by a recent Centre for Global Development study (Giugale and Nguyen 2014).

¹⁴ It should be noted that monthly transfers of existing CTs are also relatively low but could be significantly increased through natural resources revenues. For example, transfer size in Mozambique is about US\$13 month, and in Uganda it is US\$9 per month.

¹⁵ We calculate a rough estimate of the average direct dividend available to each five-person family every quarter during the first ten years of production in our sample countries. We assume that a quarter of the revenues will have to be spent on administration, and after distribution a third will be collected in tax by the government.

¹⁶ This section is based heavily on section 7 in Witter et al. (2015a).

politically stable societies; and they can contribute to sustained and inclusive economic growth.

The arguments about the macroeconomic effects of health and educational spending are important in providing a response to concerns about the high recurrent cost burden which most social sector programmes imply. Sustainability will be ensured only if the economic benefits of social sector investment are realized through effective and equitable allocation and expenditure that ultimately create and help to sustain broader economic development and progress.

- **Part of the financing gap in the social sectors in the African countries studied could be closed by natural resources revenues.** The scale of projected resources in the sample countries, allowing for currently unpredictable prices, suggests that a significant contribution could be made by the expected revenues in augmenting existing sources and helping to close some of the considerable financing gaps in the effort to reach universal health care and education. They could also provide a safety buffer if donor resources, which currently play a significant role, dwindle as predicted. In the context of an aspiration to achieve universal coverage for health, education, and social protection, the natural resources revenues could be a critically important source of financing for core services and also for an extension of coverage, quality and equity—even if not all revenues are allocated to social sectors.
- **Many possible interventions are available to start closing the gaps in health and education services; full financing of health and education gaps is not a necessity and may cause scale-up problems.** There is potential for education sector improvements to be funded by new resource revenues in all sample countries. For example, a large-scale programme to improve the quality of primary and secondary education in Ethiopia, with a population larger than any of the sample countries, has a cost of just under US\$510 million over five years—a cost that could comfortably be afforded from the projected natural resources revenues for each one of the countries considered in this paper.

However, closing the financing gaps is not the only challenge to improving health and education. Non-financial constraints to the scale-up of service provision are at least as important. Programmes need to build wider capacity, encourage harmonization between donors and government, bridge institutional divisions in the public sector, and improve collaboration between central and local levels of the health system. Some areas of these weaknesses can be addressed only gradually over time, such as the need to train more doctors. The time taken to build capacity can in some cases dovetail with the development of extractive industries.

Addressing these structural challenges requires political will, strategic vision, and some room for manoeuvre, which funding can assist. Social sector systems are complex, so the outcome of reforms is inherently largely unpredictable—the scale-up process should therefore be done iteratively, with constant adjustments over time.

- **Opportunities and challenges related to the use of natural resources revenues are not fundamentally dissimilar to those associated with other revenue sources, but the political economy risks may well be higher.** The lack of natural accountability to citizens, and the high expectations which natural resources tend to generate, increase political economy risks and challenges. In order to manage these risks, it is necessary to taken into account both the positive and negative lessons learned from social funds and other channelling mechanisms used to date, whose documentation also needs to be strengthened.

There is now quite an extensive body of experience of using social funds. Such funds can increase the transparency of resource use, but they still present important challenges in relation to building capacity and avoiding elite capture. In countries struggling with issues

of governance, transparency, and participation, there can be a case for new natural resources revenues being earmarked for specific purposes. However, evidence and opinions on the impact and efficiency of such instruments are mixed. CTs are seen as a route to increasing accountability in the use of natural resources revenues.

- **A simple diagnostic framework can help to guide social sector investment decisions in the light of new natural resources revenues.** This paper presents a simple framework that can help to guide investment decisions in health and education in the context of resource revenues via structured questions about natural resources revenues, the socio-economic context, and the sector constraints and priorities. While the framework can be applied to both sectors, as many of the challenges and issues are shared, there are also important differences. In particular, the range of conditions, interventions, and user groups in health collectively present a complex landscape for priority-setting in comparison with education, where services have a more clearly-defined package and target group.
- **Further research, analysis, and policy debate are needed.** There is a need for more evidence and more systematic documentation of lessons for spending natural resources revenues in the social sectors, especially in low- and middle-income (and fragile) states. In particular, further work is needed to adapt our diagnostic framework to the context of specific countries and to incorporate specific social sector interventions.

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