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## From fiscal stabilization to economic diversification: A developmental approach to managing resource revenues

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WIDER Working Paper 2020/108

## **From fiscal stabilization to economic diversification**

A developmental approach to managing resource revenues

Ha-Joon Chang<sup>1</sup> and Amir Lebdioui<sup>2</sup>

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**Abstract:** The management of revenues from exhaustible natural resources involves a number of challenges. In this paper, we argue that the standard policy advice to managers of resource revenues has been dominated by short-termism and the lack of a perspective on economic development and structural transformation. As a result, mainstream approaches have often addressed only the symptoms of commodity dependence (e.g. vulnerability to commodity price volatility) rather than its root causes (insufficiently diversified productive structures). This paper starts by mapping out the various options for managing resource revenues, and reviews their respective economic and political implications. After discussing the limitations of existing theoretical approaches, we suggest an alternative resource revenue management model that is more suited to the context of commodity-dependent developing countries. This approach, which consists in the gradual scale-up of investments in productivity-enhancing assets, enables the alignment of the dual objectives of short-term stabilization and long-term diversification.

**Key words:** commodity dependence, economic development, natural resources, resource revenue management, structural transformation

**JEL classification:** O14; O25; Q32; Q33

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# 1 Introduction

This paper investigates the political economy of managing exhaustible resource revenues as a pathway to prosperity and aims to reframe the resource revenue management agenda towards achieving export diversification objectives. The management of revenues from exhaustible natural resources involves a number of inter-related challenges, such as achieving inter-generational equity, coping with commodity price volatility, overcoming resource dependence, and achieving socio-economic development for local populations. In this context, one of the central policy questions in resource-rich economies is how resource revenues should be invested. For instance, how much of resource revenues should be invested in financial assets overseas for fiscal stabilization and how much should be invested domestically?

Against this backdrop, the case of Norway, which has successfully transformed its petroleum revenues into financial assets overseas, has often been lauded and put forward as a source of inspiration for other resource-rich countries with an ambition to make the most of their extractive resources. However, in this paper, we argue that the standard policy advice (which suggests that resource-rich developing countries should deal with the fiscal volatility associated with commodity prices through diligent fiscal rules to offset boom-and-bust cycles and by investing resource revenues in financial assets abroad) addresses only the short-term symptoms of commodity dependence (e.g. vulnerability to commodity price volatility) rather than its root causes (namely, the lack of diversified productive structures). The case of an already advanced country such as Norway should therefore not necessarily form the basis of lessons for policy-making in resource-rich developing countries because investment in financial assets is unlikely to lead to productive transformation.

This paper therefore seeks to reshape the discourse on resource-based development, which has in recent years emphasized the role of fiscal stabilization and investment overseas while neglecting the role of export diversification and production. By adopting a holistic and long-term approach to the issue of managing resource revenues, and by drawing on a variety of intellectual approaches, we explain why economic diversification, not fiscal stabilization, is the best way to achieve macroeconomic stability in the long run, to sustainably escape the devastating effects of commodity price volatility, and to smoothen consumption over time.

In Section 2 of this paper, we map out the various options for managing resource revenues, before reviewing the economic and political implications (as well as the limitations) of each of those options. In section 3, we aim to move the debate beyond the ‘one-size-fits-all’ approach by showing that the suitability and the urgency of resource revenue management strategies in different countries are influenced by several factors, including the degree of commodity dependence; the level of resource abundance per capita; existing deficits in infrastructure and human capital; the institutional capacity to invest; savings rates to date; and the degree of resource exhaustibility.

In Section 4, we provide recommendations for policy-makers by putting forward an alternative resource revenue management strategy that is more likely to generate positive outcomes in the context of high diversification needs. The two main features of this strategy are: (i) the gradual investment of resource revenues in real assets domestically over time; (ii) and the focus on tradable sectors to expand absorptive capacity. The resource revenue management strategy outlined in this paper can help countries not only to avoid the standard problems that arise when investing resource revenues domestically (i.e. risk of rents capture, Dutch disease, crowding-out of private investment, and wasteful spending beyond the domestic absorptive capacity), but also to build the capacity to invest through learning-by-doing, reduce the cost of misjudging the duration of a

commodity boom, and enable short-term fiscal stabilization while avoiding the opportunity costs associated with financial investments overseas by making sure that countries gradually invest in productive capabilities in the long term.

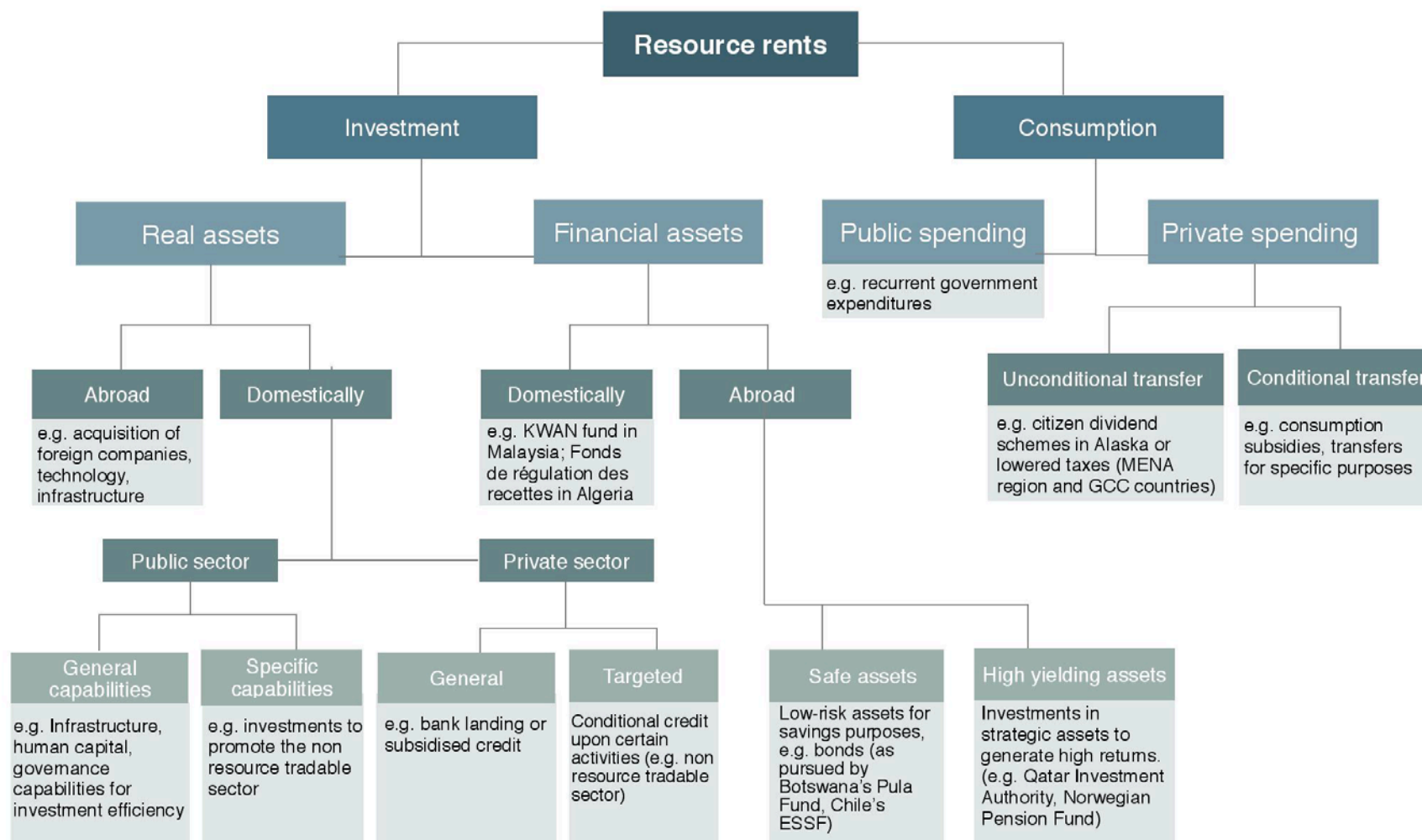
## 2 Options for managing resource revenues

How and where resource revenues should be invested remains the subject of contentious policy debates. The academic literature remains divided on several issues, such as whether resource revenues should be invested domestically or abroad (Bauer 2015; Gelb et al. 2014a; van der Ploeg and Venables 2018; Witter and Jakobsen 2018); consumed or invested (Cherif and Hasanov 2014; Hartwick 1978; Henstridge and Roe 2018); invested through a sovereign wealth fund, through the general budget, or by increasing reserves at the central bank (Mohaddes and Raissi 2017; van der Ploeg and Venables 2018); earmarked or not (OECD 2016). In Figure 1, we start by mapping out the layers of decisions for government in the allocation of resource revenues.

First, government needs to decide whether resource revenues are to be consumed or invested. Domestic consumption can be fuelled through public or private spending (through citizen dividends, subsidies, or the tax/benefits system). If invested, resource revenues can be transformed into real or financial assets (which can be used as savings for future generations or as a means of fiscal stabilization if invested in low-risk assets, as has been done by Chile's government, Botswana's Pula Fund, and Norway's pension fund). If resource revenues are invested in real assets, these can be in the public sector or the private sector (e.g. through subsidized credits, production or export subsidies, or the lowering of public debt). These decisions have important implications for economic development strategy. As Collier et al. (2010) point out, these alternatives also have fundamental implications in terms of the actors (state, private sector, or citizens) that gain ultimate control of the spending from these revenues and the overall balance between consumption and investment.

Amongst the different options for managing resource revenues, the public spending of those revenues for both consumption and investment in real assets has often been criticized on the grounds that it can lead to government failures, which can be classified into two broad categories. The first relates to investment inefficiency due to *political* factors (elite capture through corruption, cronyism, and political motivations; as well as reduced efforts to collect taxes, which may reduce government accountability). The second category relates to investment inefficiency due to *economic* factors (including fiscal instability due to commodity price volatility and currency appreciation; crowding out private investments; and spending beyond the domestic absorptive capacity). It is often argued that resource revenues accruing to the domestic economy can exceed absorptive capacity or can be wasted in unproductive investments, which can also create a vicious cycle of under-investment, inflation, and appreciation of the nominal (and real) exchange rate, which reduces the competitiveness of non-resource tradable sectors, further dampening incentives for investment in those sectors and broader economic diversification (Arezki 2011; Gelb et al. 1988; World Bank 2013).

Figure 1: The main options for managing resource revenues



Source: authors' illustration.

Given the risks associated with domestic public investment, several economists have favoured other ways to manage resource revenues. Some have argued that they should be distributed directly to citizens (e.g. Devarajan 2019). Direct distribution through cash transfers, subsidies, or tax breaks would improve accountability (by encouraging citizens to monitor resource income and forcing government to rely on normal taxation for revenues) as well as widen the opportunity for citizens to invest in human capital to complement resource wealth, rather than concentrating access to capital within a small elite (Devarajan 2019; Gelb and Grasmann 2009). In the most direct forms of redistribution to citizens, the government retains neither macroeconomic nor microeconomic control over spending (Collier et al. 2010). A few states, such as Alaska, have implemented citizen dividend schemes, but few others have followed this path. Instead, many oil exporters, for instance, distribute rents to citizens indirectly through lower taxes, consumption subsidies such as fuel subsidies, provision of social housing, and even grants to newlyweds (as in several Middle Eastern countries).<sup>1</sup> Such policy choices have been criticized. The fiscal costs of subsidizing petroleum derivatives and natural gas can be considerable, and the policies can be inefficient and difficult to reverse (Gelb and Grasmann 2009). According to International Monetary Fund (IMF) staff estimates, gasoline subsidies in Algeria represented 14 per cent of GDP in 2015, which is almost as large as the fiscal deficit itself and twice the combined budgets of the health and education ministries (Jewell 2016). Such subsidies benefit the rich more than the poor, given that the richest 20 per cent consume six times as much fuel as the poorest 20 per cent (Jewell 2016).

Even in the case of direct distribution to citizens, there are several factors that can create problems, such as the investment behaviour of individuals. According to Collier et al. (2010), citizen dividends enable the absorption problem to be transferred to private individuals, who are much better at identifying investment projects than government officials, and have sharper incentives to implement them well and make sure they succeed. Devarajan (2019) further justifies direct distribution to citizens by arguing that the mismanagement of oil revenues relates to public expenditure on consumption, through inefficient subsidies and public-sector wages, in preference to capital goods. However, at least four counterarguments can be made.

First, there is no guarantee that the choices of individuals will lead to an optimal macroeconomic time profile of consumption versus investment rates. As Arezki (2011) explains, direct redistribution may fuel increased consumption as opposed to investment.<sup>2</sup> The effect of commodity price volatility means that, if the money is used for consumption, the increase in consumption may turn out to be unsustainable, especially since volatility in consumption is challenging to deal with (Collier et al. 2010).

Second, redistribution to private citizens may not lead to an optimal macroeconomic effect of investment. Dividing resource revenues amongst citizens can lead to investments that are too small in scale to have transformative effects at the macroeconomic level, and consequently may not contribute to ‘bigger’ goals such as export diversification.<sup>3</sup> Moreover, the process of diversification through the emergence of new industries involves a process of learning-by-doing, R&D, and risk-

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<sup>1</sup> Crivelli and Gupta (2014) find a statistically significant negative relationship between resource revenues and total domestic (non-resource) revenues, with around 30 cents in non-resource tax revenues being lost with each additional dollar in resource revenues.

<sup>2</sup> ‘Individuals may underinvest the proceeds of resource revenues in, say, education and health, as they may not internalize the social benefits of those investments. One possibility would be to redistribute not necessarily directly, in the form of cash transfers, but rather in the form of greater information and enhanced transparency concerning the management of revenues [...] That will make it possible to improve the efficiency of government spending, which in turn will benefit the citizenry.’ (Arezki 2011: 161).

<sup>3</sup> Similar criticisms can be applied to microfinance (see Bateman and Chang 2012).

taking that private individuals may not be able to afford alone out of dividends from resource revenues (Lebdioui 2019b).

A third argument has to do with the intergenerational distribution of the benefits. If the generation that benefits from a resource boom use their dividends to boost consumption instead of investing, there will be little benefit to future generations from those resource revenues.

Finally, taxation has positive outcomes on state accountability and should not be eliminated. As noted by a vast scholarship, lack of taxation will likely prompt greater societal demands for accountability and scrutiny over government spending, allowing further bad governance (Brautigam et al. 2008; Cammett et al. 2015; Eubank 2012; Moore and Rakner 2002).<sup>4</sup>

As a result of the risks associated with the domestic spending of resource revenues, including public expenditure and direct redistribution to citizens, the standard policy advice has been to invest the resource revenues in financial assets overseas.<sup>5 6</sup> Several economists have emphasized that parking financial assets overseas is not constrained by the absorptive capacity of the economy, which is why financial investments should be prioritized until investments can be used *efficiently* in the domestic economy (Henstridge and Roe 2018; van der Ploeg and Venables 2018). The more radical conventional policy advice on managing revenues from non-renewable resources, based on the permanent income hypothesis (PIH), is that such revenues should be systematically saved overseas in order to avoid fiscal instability from overspending resource revenues, and that domestic spending of resource revenues in the long run would thus be financed by the returns on savings and investments overseas (e.g. Barnett and Ossowski 2003; Bems and de Carvalho Filho 2011; Davis et al. 2003).<sup>7 8</sup>

However, the standard policy advice on managing resource revenues needs to be questioned. Saving resource revenues in financial assets can lead to very high opportunity costs for capital-scarce developing countries that need to diversify their economies. Bauer (2014) emphasizes that the design of fiscal rules should depend on the context, as no single rule is appropriate for every country. In addition, we find that the standard policy advice offers solutions only for short-term

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<sup>4</sup> ‘As long as the state is able to effectively distribute its rents it remains largely autonomous from society’ (Malik 2016: 246).

<sup>5</sup> A further consideration is: where should any financial savings be placed—in the central bank or in a sovereign wealth fund (SWF)? Henstridge and Roe (2018) argue that saving through an SWF requires initial and ongoing investment (set-up and administrative costs), which are justified only if the revenues from natural resources themselves are both large and likely to be sustained over many years, as in Norway. In contrast, LICs such as Tanzania and Mozambique would be unlikely to build up capital much above the fixed costs of establishing and then operating a fund. In such situations, saving via the central bank may be preferable.

<sup>6</sup> Truman (2011) found that overseas holdings constitute 84 per cent of total investments in a sample of 60 SWFs. However, several resource-rich developing countries have recently established SWFs that are mandated to invest domestically (Gelb et al. 2014a; Monk 2013). Bauer and Rietveld (2014) argue that SWFs should serve macroeconomic objectives rather than developmental ones, and should thus not be spent domestically. As Bauer (2015) further notes, governments whose funds cannot invest domestically (as in Abu Dhabi, Botswana, Chile, Ghana, Kazakhstan, and Norway) generally achieve their targets for investment rates of return, while countries where funds can be invested or spent at home (such as Angola, Azerbaijan, Equatorial Guinea, Kuwait, Nigeria, and Russia) often become conduits for corruption, patronage, and financial mismanagement.

<sup>7</sup> The PIH was developed by Friedman (1957) and describes how agents spread consumption so that consumption is determined not only by current income but also by expected future income.

<sup>8</sup> While the IMF previously advocated for the PIH, the institution’s views have recently shifted towards a more nuanced approach, recognizing that capital-scarce developing countries require public financing to grow their economies (Bauer 2014).



fiscal stabilization at the expense of long-term structural change beyond commodity dependence. As a result, it addresses only the symptoms of commodity dependence (vulnerability to commodity price volatility) rather than its root causes (namely, the lack of diversified productive structures). In a departure from this paradigm, Section 3 provides a different outlook for resource revenue management by drawing on various theoretical approaches to the interrelation between different resource revenue management objectives.

### **3 Trade-offs between resource revenue management decisions**

Ultimately, decisions on how to spend resource revenues depend on which objectives are to be pursued, and this is inherently a political issue. However, a holistic and dynamic approach to resource revenue management sheds light on the interrelation between different objectives, such as intergenerational equity, fiscal stabilization, economic diversification, and private consumption. While those objectives are often seen as distinct and mutually exclusive (World Economic Forum 2018: 20), they are in fact intrinsically linked.

#### **3.1 Diversification as the best long-term fiscal stabilization strategy**

The destabilizing effect of commodity dependence on macroeconomic stability stems not only from commodity price volatility but also from the prospects of: (i) resource exhaustibility; (ii) changing consumer demand; (iii) lower prices due to a rising commodity supply, as discoveries of resource deposits in other countries increase; and (iv) exogenous shocks caused by technological innovations (e.g. electric cars to replace those with internal-combustion engines; sodium-ion batteries to replace lithium-ion batteries). As a result, while fiscal stabilization tools may mitigate the effects of the first factor (commodity price fluctuations) in the short term, they do not help countries deal with the other three factors in the long term. Although investments in financial assets abroad can help achieve fiscal stabilization purposes in the short term, they are unlikely to enhance the productive capabilities of the national economy because they will have no direct impact on the domestic private sector, especially if they are not linked to the acquisition of strategic assets related to domestic capabilities (Chang 2007).

In contrast, export diversification contributes to long-term macroeconomic stability more than the often-prescribed short-term fiscal stabilization through the saving of resource revenues overseas. In that context, structuralist (and particularly Prebischian) perspectives have emphasized that the diversification of a country's productive structure is the most sustainable way to reduce a country's vulnerability to commodity price fluctuations (and thus the best way to achieve macroeconomic stability). This argument is in line with the idea that macroeconomic policies are not enough to solve macroeconomic problems.

Our point is well illustrated by the case of Malaysia. Malaysia's oil exports had become the nation's top foreign exchange earner by around 1980 (Gale 1981), and oil rents reached a 12 per cent share of GDP in the same year (World Bank 2019). However, rather than ensuring short-term fiscal stabilization, Malaysia invested its oil revenues towards achieving long-term structural transformation objectives. In fact, during most of the period 1970–98, Malaysia's overall fiscal management was characterized by a very high fiscal deficit as a proportion of GDP but, more importantly, public investments had a transformative effect on the export basket in the long run (Di John 2009). The World Bank (2013) also argues that Malaysia's impressive economic performance is closely tied to its sound management of natural resource revenues and that Malaysia is one of the few countries that has followed the Hartwick rule, according to which the value of (net) investment needs to equal the value of rents on extracted resources at each point in time

(Hartwick 1978). Malaysia has indeed converted natural wealth into productive capital assets (namely infrastructure, machinery, human capital, and institutions) that have supported economic diversification towards manufacturing and services. This strategy notably explains why oil rents now represent only 1.6 per cent of Malaysia's GDP (World Bank 2019). The progressively decreasing share of oil rents in Malaysia's GDP has further reduced the impact of oil price volatility on the domestic economy, even during the 2000s commodity boom (Lebdioui 2019a).

A contrasting experience is offered by the case of Botswana. Botswana has been praised for its diamond revenue management, which has consisted in investing diamond rents in financial assets overseas through the Pula Fund. However, this strategy has not contributed to the diversification of the domestic economy. As a result, diamond extraction still represents 80 per cent of export earnings and 60 per cent of government tax revenues, which is particularly dangerous as it is estimated that the country's diamond reserves will be depleted by 2027 (Biedermann 2018). In addition, Botswana's diamond era is steadily approaching an end after five decades due to the escalation in production costs (Biedermann 2018). Estimates from the Botswana Institute for Development Policy Analysis have also shown that, after diamond depletion (between 2025 and 2027), GDP will drop over 50 per cent below the non-depletion path (Grynberg et al. 2015). This example shows that an overarching focus on macroeconomic stability and strategies to invest abroad, though they help address short-term fluctuations, can be detrimental to long-term development if they delay the transformation of the domestic economy.

In the context of resource dependency, because economic diversification requires active use of resource rents to increase the productivity of other exportable sectors and reduce their production costs (Cherif and Hasanov 2014; Gelb and Grasmann 2009), governments should prioritize investments that might have transformational macroeconomic effects, rather than aim to achieve fiscal stabilization alone.<sup>9</sup>

### **3.2 Sustainable and gradual increase in private consumption**

Economic diversification is indeed the most sustainable way to achieve a gradual and long-run increase in private consumption. While saving for future generations by accumulating revenues in an SWF pushes benefits too far ahead in the future (Collier et al. 2010), and while direct and indirect redistribution to citizens may lead to an immediate increase in consumption at the expense of future generations, domestic investments for economic diversification generate growth that benefits all generations. Indeed, it can be argued that a better way to ensure intergenerational redistribution than saving funds through investment in financial assets is through growth, because future generations will then live in a society with higher living standards.<sup>10</sup>

While neoclassical models (and the PIH in particular) are concerned with the smoothing of consumption over time, other approaches, such as the Hartwick rule and the Feldman-Mahalonobis model (which are more in line with Keynesian and neo-Marxian perspectives), may

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<sup>9</sup> Recent macroeconomic studies show that domestic investment of resource revenues holds the potential to promote economic growth and economic diversification (Berg et al. 2012; Collier et al. 2010; Isaksson 2009). However, Gelb et al. (1988) found a negative correlation between domestic investment of resource revenues and economic growth. The difference in results can be explained by the fact that what matters is not just the size of public investment but also its design, scope, and implementation.

<sup>10</sup> According to the World Bank (2013: 35), 'using natural resource revenues to finance consumption is akin to a firm financing dividend payouts by liquidating its assets: both increase present income at the expense of future income'. In addition, using resource revenues to finance an immediate increase in consumption can be problematic due to the volatility of resource revenue. Cutting back on consumption is politically undesirable, as individuals get used to higher consumption rates.

provide a more convincing account of the trade-off between immediate and future consumptions. These approaches suggest that revenues generated by exhaustible resources should be reinvested in the production of capital goods in order not just to reach a high standard in consumption but also to accumulate productive capabilities (which will allow the country to generate income after natural resources are depleted).<sup>11</sup> According to the World Bank (2011), few resource-rich countries have followed the Hartwick rule over the last 35 years, because resource rents tend to be used to finance consumption rather than investment. In many instances, the outcomes that would have been achieved by observing the Hartwick rule are very different from actual outcomes. For instance, Nigeria could have had a stock of produced capital four times higher than its actual stock, and Gabon could have had a stock of US\$68,000 per person, even higher than the US\$58,000 of oil-poor South Korea (World Bank 2011).

### 3.3 Beyond the one-size-fits-all approach

Decisions on how to manage resource revenues involve several trade-offs, which are inherently political decisions. Nevertheless, there are several factors that influence such decisions. Sections 3.1 and 3.2 have shown that some of these factors are dynamic across time, given the trade-off between short-term fiscal stabilization and long-term diversification. Nevertheless, those trade-offs are also dynamic across space. Different resource-rich countries may have different needs for domestic investments according to several factors, which are summarized in Table 1.

Table 1: Factors that influence the trade-offs between resource revenue management decisions

Factors	Explanation
Degree of commodity dependence	The more dependent a country is on a given commodity, the more urgent diversification becomes (contrast highly oil-dependent countries such as Algeria, Angola, Saudi Arabia, and Venezuela with Malaysia or the United States).
Savings rate to date	The current savings rate contributes to the ability of the country to invest domestically, as a country with large savings would already be 'insured' in the case of a commodity price collapse (e.g. Chile).
Investment deficit	Investment deficits (include low spending on human capital, education, or R&D) increase the opportunity costs of resource revenue investments in financial assets overseas because funds are not made available for domestic investment (e.g. Algeria, Botswana, Chile, Nigeria).
Degree of resource exhaustibility and anticipated price fluctuations	If resources are to be depleted in the long term, or if their value is to decrease due to changes in consumer demand or technological innovations, the urgency to diversify sources of revenues through the transformation of domestic productive structures increases (e.g. in fossil fuel-dependent economies).
Institutional capacity to invest	A government's ability to spend revenues effectively is affected by the level of institutional development.
Degree of resource abundance per capita	The opportunity costs of investment in financial assets overseas are lower for countries that are highly resource-rich per capita (e.g. Kuwait, Qatar, UAE) than for those that are moderately resource-rich per capita (e.g. Algeria, Nigeria), where there is a need for employment generation outside of extractive sectors (see Section 3.3.2).

Source: authors' construction.

As noted by Gelb (2010: 19), 'although there is evidence that diversifying economies can expect to do better over the long run, the urgency of the issue [of domestic investment] will vary across countries'. The extent to which a country should prioritize the domestic investment of resource revenues over investments in financial assets overseas is indeed determined by several variables,

<sup>11</sup> Hartwick (1978) further argued that an optimal constant level of consumption could be sustained if the value of (net) investment equals the value of rents from extracted resources at each point in time.

including its degree of export concentration, degree of resource abundance per capita, savings rate to date, and current deficit in infrastructure and human capital stock. Domestic institutional conditions also matter, as they also affect the ability of state to pursue domestic investments. The next sections explain some of these factors in further detail.

*Tackling the low investment rates that characterize several economies*

Fiscal stabilization through resource revenue investments in financial assets overseas can carry high opportunity costs in some contexts because funds are then not made available for domestic investment, thereby ignoring the developmental needs of capital-scarce developing economies (Bauer 2014; Berg et al. 2012). Under-investment in tangible and intangible assets, including education, infrastructure, and R&D, can hinder the development of domestic productive structures, which is why resource revenues can provide an opportunity to break the pattern of low investment rates that characterizes capital-scarce developing economies by relaxing financing and fiscal constraints.

While high-growth countries invest 5 to 7 per cent of GDP per year in incremental education and infrastructure, most countries with lower growth invest only around 3 per cent (Collier et al. 2010). To date, even developing countries with natural resource rents have not had domestic investment rates commensurate with their increase of resource revenues (Collier et al. 2010). While there is a need to cushion the impact of resource revenue volatility, this should not be at the expense of allowing the domestic economy to benefit from commodity booms (Collier et al. 2010). This explains why the PIH has been increasingly criticized as a basis for resource rent management strategy in recent years.<sup>12</sup>

Let us illustrate this point. While it makes sense for a country such as Norway to save and invest its revenues abroad because it already has high levels of infrastructure and an educated labour force, resource-rich developing countries such as Algeria, Angola, and Nigeria could generate a lot of growth by investing domestically to alleviate patterns of low spending on education, R&D, etc.<sup>13</sup> Botswana illustrates quite well the opportunity costs stemming from overseas investments. While the country is often praised for its strong institutions and macroeconomic management of resource revenues through savings of diamond revenues for future generations and overseas investment (Acemoglu et al. 2001; Alfaro et al. 2003; Sarraf and Jiwanji 2001), the extent to which its domestic economy and the population are benefiting from those resources can be questioned. Diamond rents accrue to the Pula Fund, whose investments are all external to Botswana; thus the *activities* related to those investments do not have any significant direct domestic macroeconomic implications (International Forum of Sovereign Wealth Funds 2018). Meanwhile, Botswana's poverty rate (measured as the share of the population living on under US\$5.50 a day, PPP) has decreased by only 1 per cent annually since the creation of the Pula Fund in 1993 and was above 60 per cent in 2016 (World Bank 2019).<sup>14</sup>

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<sup>12</sup> See Araujo et al. (2012); Bauer (2014); Sachs (2007); Takizawa et al. (2004); van der Ploeg and Venables (2011); and Venables (2010). Berg et al. (2012) argue that the standard advice based on the PIH may only be attractive when resource revenues are expected to be exhausted within 10 to 20 years.

<sup>13</sup> Interestingly, even in Norway (where the opportunity costs of investing abroad are arguably lower than in most developing countries), some politicians argue that more of the fund should be used for domestic spending (Torvik 2011).

<sup>14</sup> Nevertheless, it should be acknowledged that in the 1980s, prior to the creation of the Pula Fund, the government was facing enormous social demands for particular expenditures of one kind or another (Leith 2005). The ratio of government expenditure to GDP grew until becoming one of the highest in Africa (Leith 2005).

In a similar perspective, Solimano and Calderón Guajardo (2017) argue that the copper revenue management case of Chile reveals high opportunity costs of over-investing in stabilization funds at the expense of social spending. Indeed, there is no clarity regarding the optimal level of resource accumulation in various stabilization funds, with a possible tendency towards over-insurance in fiscal management (Solimano and Calderón Guajardo 2017). Chile's Economic and Social Stability Fund (ESSF), Pension Reserve Fund (PRF), and copper-funded Defence Fund currently have assets of nearly 10 per cent of GDP (which becomes 20 per cent if we include the international reserves held by the Central Bank), while Chile's levels of public spending in education, health, pensions, and other social sectors as a share of GDP are consistently below those of OECD and other Latin American economies of middle and large size, in a context characterized by large income and wealth inequality (Solimano and Calderón Guajardo 2017).

As a result, in the context of strong institutional capacities, investing resource revenues domestically, rather than in financial assets overseas, holds the potential to put the economy on a growth trajectory that will increase income rates, improve public infrastructure, reduce public debt, and reduce the interest rates that an economy faces in international capital markets, which would crowd in private investments (Venables 2010; World Bank 2013). Additionally, in contrast to direct redistribution to citizens, public investments for industrial development or government lending to the private sector increase the likelihood that resource revenues will be used for investment rather than for consumption.<sup>15</sup>

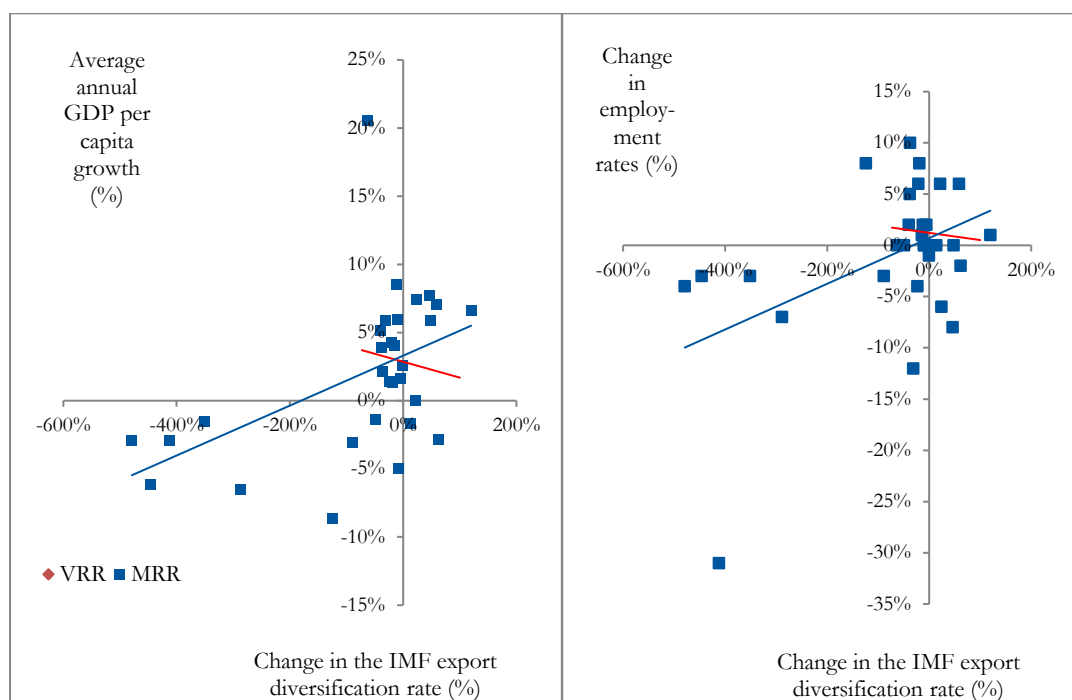
#### *Degree of resource abundance per capita*

Further arguments can be made for countries not to systematically follow the Norwegian example, where resource revenues have successfully been invested in financial assets overseas. The hypothesis that was tested in Lebdioui (2019a) revolves around the degree of per capita resource wealth: while highly resource-rich per capita countries (defined as the 10th decile in terms of extractives rents per capita, henceforth VRR) seem to be able to develop despite natural resource dependence, there is a strong correlation between economic growth (and employment) and export diversification for moderately resource-rich per capita countries (which rank in the 8th and 9th deciles in terms of extractives rents per capita—henceforth MRR). Figure 2 reveals the clear variation in the correlation between growth and export diversification (left panel) as well as between employment and export diversification (right panel) for both VRR and MRR countries in times of low commodity prices.

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<sup>15</sup> Henstridge and Roe (2018) argue that because LICs also suffer from a deficit of adequate operations and maintenance (O&M) of their *existing* capital stock, and because building public-sector capability is key to increasing the returns to capital in the long run, some spending should be designated for consumption (e.g. salaries, O&M activities of existing infrastructure) rather than all of it being designated for investment. However, such decisions can often be hijacked by political pressures (e.g. to hike public sector wages), as in Ghana (Bawumia and Halland 2018).

Figure 2: Correlation between changes in GDP per capita/employment rates and diversification rates in a period of low commodity prices (1990–2000)



Source: authors' elaboration based on data from IMF (2018) and World Bank (2019).

Those findings imply that while some of the most resource-rich (in per capita terms) countries (such as Kuwait, Norway, Qatar, Saudi Arabia, and UAE) can more easily sustain growth without necessarily undergoing a transformation of their economies, diversification is a key factor in economic development for MRR countries, which should consequently follow a pattern of resource rents management that focuses more on domestic investment for diversification.

How can we explain these developmental differences across categories of resource-rich countries? While it would be reductionist to attribute a nation's development path solely to its per capita resource endowment, it seems that the degree of per capita resource abundance influences patterns of resource-based development and diversification by affecting the nature of political, economic, and societal challenges. The degree of resource wealth per capita influences both political factors, such as pressure for rents distribution, buying social consent, and governance (see Cammett and Diwan 2016), and economic factors (such as employment generation in the context of the low labour intensity of extractive industries). Indeed, one of the main differences between VRR and MRR countries is in the trade-off between social redistribution and long-term growth. Unsurprisingly, higher levels of resource rents per capita provide the state with enough financial resources for broad social redistribution among citizens without compromising or cutting back the investments needed to promote economic growth. In contrast, in resource-rich countries with lower per capita resource wealth, there is a clear threat of economic stagnation caused by excessively redistributive policies, as well as a threat of economic disparity amongst the population if growth is encouraged at the expense of social spending (see Abidin 2001 for a similar argument in the context of Malaysia; and Cammett et al. 2015 for the context of the MENA region).<sup>16</sup>

<sup>16</sup> This logic relates to what North et al. (2009) call a 'limited order arrangement': when resources are plentiful, ruling coalitions can afford to be broader and more stable; when they are more limited, ruling coalitions are narrower because

It appears that the degree of resource abundance per capita also plays a role in determining patterns of export diversification and employment generation. While policy-makers in VRR countries can afford to transfer rents to their populations (through the private sector in particular) without the need to generate employment, MRR countries usually cannot afford similar strategies and are more likely to need to generate employment by diversifying their economy, especially given the low labour intensity of extractive activities.<sup>17</sup> As a result, VRR countries may face less pressure than MRR countries to industrialize through labour-intensive manufacturing activities, and are more likely to invest in financial assets and services. Countries with the highest per capita oil-income indeed feature the lowest share of manufacturing exports amongst resource-rich economies (Lebdioui 2019a).<sup>18</sup> These observations echo the finding of Sachs and Warner (1995: 19) that ‘for the most highly resource-endowed economies [...] the natural resource base is so vast that there is no strong pressure to develop an extensive industrial sector’.

However, even though MRR and VRR economies face a differentiated sense of urgency and risk with regard to structural transformation at the expense of financial diversification, economic diversification should remain a priority for VRR countries. Remarkably, Cherif and Hasanov (2014) have shown that in the GCC oil-exporting countries, despite improvements in living standards, a rising export concentration since the 1970s has led to a steady decline in GDP per worker and income relative to the USA, in contrast to economies such as Singapore or Malaysia.

Though VRR economies also need to diversify, their circumstances remain particular and cannot be replicated by most other countries. The experience of countries that have followed a pattern of financial diversification, such as Norway and Qatar, should thus not necessarily form the basis of lessons for policy-making in MRR developing countries. While investments in financial assets are unlikely to lead to productive transformation, MRR countries can reap more benefits from diversifying their productive structures as swiftly as possible. As a result, the PIH (and by extension the Norwegian model) is far from being the ‘best practice’ strategy.

### *Institutional setting*

A government’s ability to spend revenues and allocate resources effectively is affected not only by the level of institutional development prior to extractives production, but also by political factors that come into play once extractive resources are produced and public expectations are raised (Lahn and Stevens 2018).<sup>19</sup> While the risks associated with public investments of resource revenue require attention and sometimes cannot be eliminated, it should be stressed that they are not altogether unavoidable and that several institutional measures exist to mitigate them (Gelb et al. 2014a; Gelb et al. 2014b). The literature on managing resource revenues has often featured a static view of the trade-off between the risks and benefits associated with the domestic investment of

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it is fiscally impossible to buy the consent of a large portion of the population. This argument echoes Addison’s (2009) observation that economic success reduces rulers’ need to use violence to secure their power.

<sup>17</sup> Instead, VRR countries, such as Saudi Arabia, can rely on the public sector to generate excess employment (thereby transferring rents). The Saudi labour market has been characterized by a dependence on the public sector (e.g. public administration, defence, health, and education), where the average wage for Saudi nationals is far higher than in private employment in other sectors (McKinsey 2016).

<sup>18</sup> The share of manufacturing in total exports in 2009 was only around 7 per cent for resource-rich labour-importing countries, in comparison with 35 per cent for resource-rich labour-abundant countries and 60 per cent for resource-poor countries (O’Sullivan et al. 2011).

<sup>19</sup> Cust and Mihalyi (2017) have even found evidence of a ‘presource curse’, suggesting that the expectations following the discovery of natural resources can pressure governments (e.g. in Ghana, Lebanon, Mongolia, and Sierra Leone) to embark on risky borrowing on the back of overoptimistic projections, which leads to growth disappointments.

resource revenues. However, as in the context of growth strategies more broadly, the rent-seeking costs have to be set against the gains (Khan 2007). In addition, if it is true that governments lack the capacity to invest domestically, what makes them acquire it when it comes to overseas assets? It can be argued that governments can also poorly target investment opportunities overseas (unless they entrust the management of the funds to international fund managers; but a country characterized by bad governance and poor institutional capacity might be least likely to give up control of its resource revenues). More attention should thus be given to the accountability mechanisms and investment benchmarks that can help ensure that resource revenues are managed productively.

There is a large body of literature on the different institutional mechanisms that can help reduce the risks of elite capture of resource rents. These include evaluation and monitoring mechanisms, transparent reporting, and corporate governance rules. As explained by Collier et al. (2010), avoiding elite capture requires mechanisms that can be either *ex ante* (how decisions are authorized) or *ex post* (how they are evaluated), and can derive from either top-down authority or bottom-up pressure (from citizens and their representatives, civil society groups, or norms internalized by the public sector workforce). Efficient evaluation and monitoring require transparent reporting. SWFs permitted or mandated to invest domestically should thus issue publicly available reports covering their activities, assets, and returns; and should allow both internal and external audits (Gelb et al. 2014a). While all funds embody ‘vertical accountability’ (reporting to the government), some also mandate ‘horizontal accountability’ to a wider audience, by making information on balances, earnings, deposits, and withdrawals publicly available or by sharing decision-making power among a range of interest groups independent of the government (Gelb and Grasmann 2009). In Norway, although the pension fund is administered by the Central Bank, decisions on transfers must be approved by parliament. In São Tomé, civil society representatives sit on the Petroleum Oversight Committee. In contrast, in Indonesia, because of the lack of ‘horizontal’ transparency, vertical accountability alone has proved insufficient to prevent a kleptocracy (Gelb and Grasmann 2009). In Kazakhstan and Azerbaijan, spending decisions are essentially made by the President. In Algeria, the lack of horizontal transparency in the management of the *Fonds de Régulation des Recettes*, which accumulated US\$32.5 billion to finance the government budget, has made it difficult to verify rumours concerning its depletion (Le Matin d’Algérie 2017).

The importance of corporate governance also cannot be overestimated. The creation of resource funds is neither necessary nor sufficient in itself to sustain good macroeconomic management, since funds can be subverted and captured when institutional capabilities are weak (Davis et al. 2003; Gelb and Grasmann 2009). Establishing appropriate benchmarks is thus necessary to ensure the integrity of investment decisions (Gelb et al. 2014a). This is particularly important because domestic public investments not only are commercially targeted but also carry a social mandate, with an allowance for lower returns as a trade-off for public utility (Cammatt and Diwan 2016; Gelb et al. 2014b; Ross 1999). Nevertheless, because social returns are often difficult to measure, the allowance for lower returns can lead to lobbying by special interests and even corruption and political agendas to distort public investments (Robinson and Torvik 2005). Strong benchmarks will set the allowance for investments of resource revenues that carry a mandate beyond profit seeking and establish clear criteria for identifying investments with social returns.



## 4 A developmental approach towards investing resource revenues

In the light of the need for more economic diversification in many resource-dependent economies, there has been a revival in efforts to rethink the trade-off between resource revenue investments in financial assets overseas and in real assets at home.<sup>20</sup> We aim to build on these efforts by further elaborating a dynamic—rather than static—approach to the trade-offs underlying resource revenue management.<sup>21</sup> In particular, we suggest an approach (or more exactly, we are bringing back an ‘old’ approach rooted in early structuralism) geared towards using resource revenues to overcome domestic structural constraints (such as low technological sophistication, limited areas of competitive advantage, and low absorptive capacity) while mitigating the economic risks associated with resource revenues (such as public investment inefficiency, absorptive capacity constraints, and Dutch disease).

This approach is dynamic across time because it emphasizes the gradual shift between short-term fiscal stabilization and the long-term accumulation of productive capabilities. It also takes account of policies to improve the country’s institutional capacity to invest over time. Indeed, it acknowledges the endogenous relationship between state capacity and growth by taking into account how certain patterns of resource revenue investment can better contribute to building state capacity over time. Our approach has two main features, which are developed in the subsections below:

- The gradual scaling-up of domestic investments in real assets;
- The targeting of tradable sectors in order to reduce commodity dependence and to ensure macroeconomic stability in the long run.

The approach also has several benefits, including:

- Explicitly incorporating the building of the capacity to invest (e.g. through learning-by-doing);
- Reducing the cost of misjudging the duration of a commodity boom;
- Taking into account the diminishing marginal utility of public spending and the issue of absorptive capacity;
- Enabling short-term fiscal stabilization, while enabling the long-term accumulation of productive capabilities through domestic investments;
- Allowing the reduction of the opportunity costs associated with over-insurance through overseas financial investment of resource revenues.

### 4.1 Gradual scaling-up of domestic investments in real assets

There is a large academic literature on public investment efficiency. For instance, Pritchett (2000) argued that in many developing countries public investment is not inherently productive because inefficiency, waste, or corruption often distort its impact on capital accumulation. Some studies,

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<sup>20</sup> See, for instance, Bauer (2014), Berg et al. (2012), Cherif and Hasanov (2012), Collier et al. (2010), Gelb and Grasmann (2009).

<sup>21</sup> For instance, Berg et al. (2012) provide a useful model that combines raising public investment and saving some of the revenues in a fund, but treats public investment inefficiency, absorptive capacity constraints, weak tax systems, and Dutch disease as pervasive features in developing countries. The model also infers that investment efficiency does not improve over time, because it assumes that its determinants (such as institutional and governance quality, as well as administration and managing capacity) can take a long time to improve.

such as Petrie (2010) and Rajaram et al. (2014), have highlighted the role of institutional capabilities in ensuring the efficiency of public investment management. However, these studies do not specify how public investment should be designed and simply assume that high institutional capabilities will ensure the design and the implementation of ‘good’ policies.

Others argue that countries should invest in their capacity to invest *before* domestically investing their resource revenues to ensure that public investment leads to high returns in terms of growth (Collier et al. 2010; Collier and Laroche 2015; Henstridge and Roe 2018; van der Ploeg and Venables 2018). While this is a very sensible argument, the question that remains is: how should governments increase their capacity to invest? Given the underlying assumption that it takes a long time for countries to develop good institutions and absorptive capacity (building up government administrative capacity, addressing bottlenecks in the economy, investing in education and skills), public investment is likely to be inefficient in the foreseeable future and cause economic distortions. One element of great importance that is often forgotten in such arguments is the existence of opportunities for learning-by-doing in the very activity of investment.

In contrast to the arguments above, Gelb and Grasmann (2009) contend that the allocation of domestic investments, rather than being fixed at a certain portfolio share, should be determined on the basis of a comparison with the potential returns on overseas investments; when domestic returns are low, investment would then be channelled abroad. This would safeguard the efficiency and high returns of investments, while investment with a ‘developmental’ purpose could still be benchmarked against the financial return on foreign assets. While this approach has a lot of benefits and safeguards, it may not be suitable in terms of taking into account the ‘strategic’ and social value of certain investments over others, not only domestically but also abroad, and potential synergies between domestic and overseas investments.<sup>22</sup> Indeed, overseas investments can be linked to strategic domestic industries and thus should be measured not only in terms of their financial returns but also in terms of their economic impacts and value creation domestically. For instance, SWFs can be a means to acquire technology that could help promote the industrial upgrading of domestic industries, as well as to acquire distribution channels through strategic acquisitions (e.g. Malaysia’s sovereign development fund Khazanah Nasional, which invested in high-tech companies abroad in order to foster value addition in the domestic electronics sector).

More importantly, it can be assumed that low-return-yielding investments may initially be required in order to build competitiveness and increase the returns on domestic investments in the long run. Indeed, low domestic rates of return can reflect a lack of dynamism or opportunities in a national economy but could also be the result of bottlenecks that could be alleviated (e.g. infrastructure). In cases where domestic investments provide low returns because of bottlenecks that relate to infrastructure or human capital availability, determining the domestic allocation of investments solely on the basis of a comparison of returns on foreign assets would lead to stagnation and the preservation of the status quo. Instead, initial transformational investments may be needed to increase the marginal productivity of subsequent capital investments, even if they bring lower returns than foreign assets. In that perspective, Bauer (2014) suggests an intermediate rule whereby governments in countries that need financing for development projects and have the ‘absorptive capacity’ to implement such projects efficiently may increase spending in the *early* years

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<sup>22</sup> Some investments may have low financial returns, but may be useful in crowding in private investments. For instance, the semi-public agency Fundación Chile created a firm in 1980 called Berries la Union, which later went bankrupt but was nevertheless important in showing entrepreneurs that the cultivation of berries in Chile was possible. By 2018, the industry’s exports exceeded US\$600 million (UN Comtrade 2020). The original investment, through what could be considered semi-public entrepreneurship, did not require high financial returns in order to successfully result in the development of a new product, which then generated high societal benefits.

of production to address development bottlenecks. While this approach is more sensitive to the bottlenecks to structural transformation in developing countries, the assumption of absorptive capacity as a precondition for domestic investments of resource revenues and the degree of endogeneity between these two parameters is still open to debate.

Departing from existing suggestions, we propose a policy alternative consisting in the gradual scaling-up of the domestic component of investments from resource revenues, which can allow the capacity to invest to be built up through learning-by-doing while progressively expanding the absorptive capacity of the national economy. Indeed, it can be argued that increasing the efficiency of public investment involves some degree of learning-by-doing on the part of policy-makers and civil servants in developing the technical expertise and institutions required for project appraisal, implementation, monitoring, evaluation, and so on.

By capping the allowance for domestic spending in the first few years of a commodity boom, potentially wasted revenues, or ‘damage’ caused by inefficient investment, can be constrained. Indeed, evidence suggests that scaling up public investment too much and too fast could subject the economy to more instability, lower investment efficiency, and higher depreciation rates, without the guarantee that such a strategy will outperform a more conservative scaling-up path (Berg et al. 2012; Gelb and Grasmann 2009). Moreover, gradually localizing the investment of resource revenues takes into account the diminishing marginal utility of public spending and the potential lack of absorptive capacity. The progressive increase in the domestic allocation proposed in our strategy allows the domestic economy to gradually adjust its supply-side capabilities in order to absorb larger volumes of capital, thereby reducing the risk of crowding-out, in terms of both capital and skilled labour.<sup>23</sup>

In addition, this gradual approach reduces the cost of misjudging the duration of a commodity boom. Indeed, policy-makers have also often misjudged the nature of the boom, which can lead to high costs and inefficiency (Gelb and Grasmann 2009). Policy-makers may overspend revenues in the first years of what is anticipated to be a long commodity boom but turns out to be short. By gradually investing resource revenues domestically, policy-makers avoid overspending in the case of a short boom but also ensure that investments accrue domestically in the event of a long boom. This approach consequently enables countries to safeguard against short-term macroeconomic instability in the context of commodity price volatility. The trade-off between financial investments and real investments is thus dynamic over time in our model and the policy priority should shift from fiscal stabilization towards capital accumulation in productive sectors, to stimulate development over the long run. Given that it is difficult to estimate the duration of commodity booms, the option of gradually allocating more resources to domestic investments reduces the risk of overspending resource revenues accumulated in a short commodity boom but will not unduly delay the reconfiguration of the domestic economy.

Such a strategy would not necessarily oblige states to invest all their domestic allowance but would only constitute a cap. It is thus not systematically incompatible with the suggestion by Gelb et al. (2014a) to allocate domestic investments in competition with external assets. An important point to add is that the share of resource income that is used for domestic investments in productivity-enhancing assets should be smoothed on a yearly basis so that the short-term volatility of resource income is absorbed by investment in financial assets rather than by the allowance for domestic

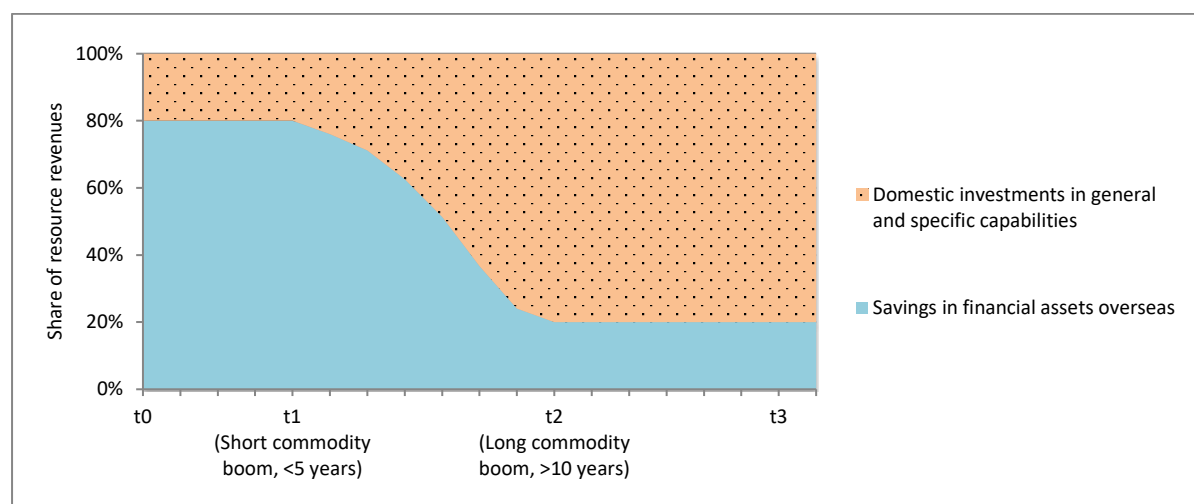
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<sup>23</sup> Crowding-out refers not only to the fall in private sector investment caused by higher government spending, but also to the skilled and specialized labour or resources that might be monopolized by government investments.

investments. This could be achieved through the use of stabilization funds or through hedging (which enables governments to lock in the price of their future production).

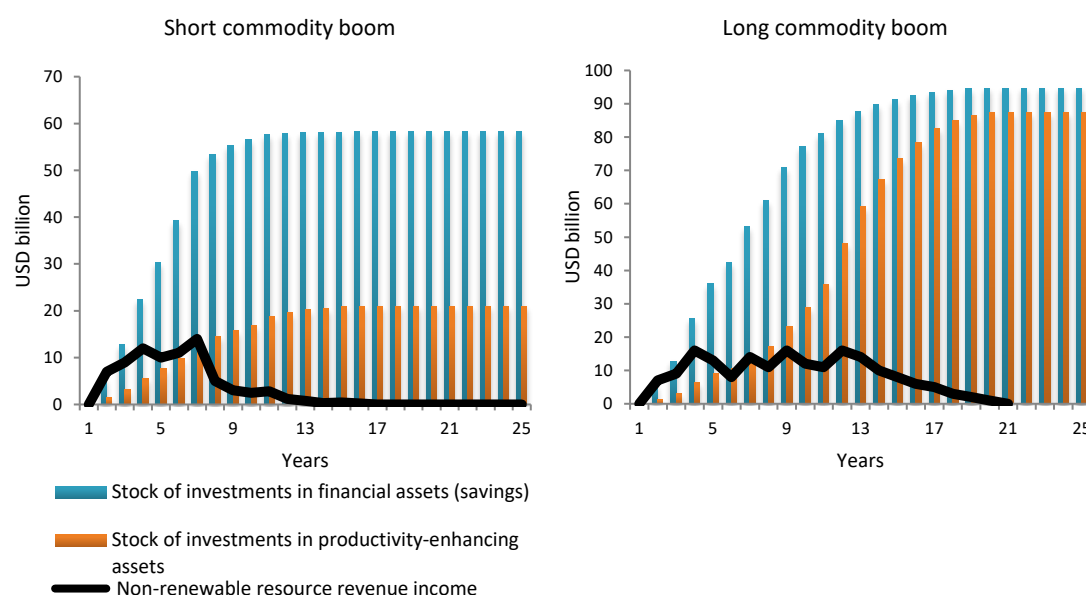
The following figures help illustrate how our model works. These visualizations are for illustrative purposes only, because different countries will face different conditions, which may influence the optimal allocation of resource revenues and the rate at which investments in productivity-enhancing assets need to be scaled up. Nevertheless, the general direction and logic of how resource revenues should be dynamically managed to sustain productive diversification in commodity-dependent countries remains the same.

Figure 3: Representation of the gradual shift in the allocation of resource revenues suggested in our model



Source: authors' illustration.

Figure 4: Distribution of the stock of assets acquired through resource revenues under different scenarios



Source: authors' illustration.

Figures 3 and 4 illustrate the shift over time in the allocation of resource revenue investments between financial assets and productivity-enhancing domestic assets, which enables alignment of

the dual objectives of short-term stabilization and long-term productive capability accumulation. Figure 4 shows that the distribution of assets under our model dynamically adapts to the length of a commodity boom, which reduces the potential opportunity costs associated with over-insurance through saving of resource revenues as financial assets without jeopardizing the short-term fiscal stabilization that is much needed in the case of an (unexpectedly) short commodity boom.

## 4.2 Targeting tradable sectors

Although increased government spending can generate demand pressures on non-traded goods, leading to a real appreciation and a decline in traded-good production (van Wijnbergen 1984), efficient public investment can also raise productivity in non-resource tradable sectors, counteracting the Dutch disease (Berg et al. 2010; Cherif and Hasanov 2012, 2014). Over time, resource revenues can indeed be used to relax capital and technological constraints, especially in the non-mineral resource sectors, in order to promote the diversification and the development of productive structures.

Several works have examined the desired degree of sector-specificity in the public investment of resource revenues. Collier et al. (2010) argue that the dangers of crowding-out and the Dutch disease can be offset by public spending designed to increase the competitiveness of private sector investments by complementing private sector activities (such as improvements in infrastructure and human capital). Nevertheless, a sole focus on the capacity to absorb investment offers no guarantee that the economy will be able to diversify and productively ‘develop’ rather than merely ‘grow’ while remaining resource dependent. Indeed, relying on existing market structures and simply enhancing private sector activities is unlikely to lead to diversification and development.

The debate on absorptive capacity has been enriched by Cherif and Hasanov’s (2012) study of the consumption, savings, and investment policies of oil exporters. The authors concluded that the tradable sector plays a paramount role in investment-saving dynamics and that developing countries may need to pursue a purpose-specific set of policies to develop sophisticated tradable sectors rather than relying solely on providing an ‘enabling environment’ in which a sophisticated export sector would spontaneously emerge by itself. Cherif and Hasanov (2012) also argue that productivity increases as a resource-abundant economy becomes more diversified by developing tradable sectors. Our model has adopted and incorporated their approach to absorptive capacity, which calls for a broader and more complex consideration of the role of public investment of resource rents in orienting market incentives towards a diversification of the tradable sector.

The need to focus public investment in the non-resource sectors becomes even greater in the context of high resource dependence. As Arezki (2011) rightly suggests, governments in resource-rich countries should increase their revenue mobilization in the non-resource sectors—through taxation, for instance—to reduce the vulnerability of their fiscal revenues to commodity price volatility. However, in contrast to Cherif and Hasanov (2012), Arezki (2011) focuses on revenue mobilization *from* the non-resource sector, instead of resource mobilization *towards* the non-resource sector. This distinction matters because—unless there are already sources of revenues from dynamic non-resource sectors (which is by definition not the case in resource-*dependent* economies)—before being able to increase revenues from the taxation of non-resource sectors, governments need to stimulate new sources of revenue generation in non-resource sectors.

## 5 Conclusion

This paper has reframed the challenge of resource-based development with a view to enhancing productive diversification and provides a model that departs from the mainstream literature and conventional policy advice. The conventional wisdom is that countries should deal with the fiscal volatility associated with commodity prices through conservative fiscal rules to offset boom-and-bust cycles and by investing resource revenues in financial assets abroad. However, such theoretical perspectives have suffered from two major shortcomings.

First, it has been established that there is no one-size-fits-all solution to managing resource revenues. The way resource revenues should be used depends on several factors, which differ across time and space. These influence the trade-offs underlying resource revenue management decisions, notably by influencing the opportunity costs of investing resource revenues in financial assets abroad.

Second, the current discourse on resource wealth management lacks a holistic vision of resource revenue management for the purpose of productive structural transformation. Stabilization funds and fiscal rules can at best mitigate the symptomatic effects of commodity price volatility but do not address the root causes that make a country vulnerable to resource earnings fluctuations. The critical issue for public investment in resource-dependent countries is therefore the sustainable diversification of the productive matrix to generate new sources of foreign exchange instead of statically maximizing rents from existing income streams.

In that perspective, our paper offers a dynamic approach to resource rent management and policy recommendations that can ensure the efficient investment of resource rents towards productive capacity-building and long-term economic development.

## References

- Abidin, M.Z. (2001). 'Competitive Industrialization with Natural Resource Abundance: Malaysia'. In R.M. Auty (ed.), *Resource Abundance and Economic Development*. Oxford: Oxford University Press.
- Acemoglu, D., S. Johnson, and J.A. Robinson (2001) 'An African Success Story: Botswana'. CEPR Discussion Paper 3219. London: Centre for Economic Policy Research. <https://doi.org/10.2139/ssrn.290791>
- Addison, T. (2009). 'The Political Economy of the Transition from Authoritarianism'. In P. De Greiff and R. Duthie (eds). *Transitional Justice and Development: Making Connections* (pp. 110–41). New York: Social Science Research Council.
- Alfaro, L., D.L. Spar, F. Allibhoy, and V. Dev (2003). 'Botswana: a Diamond in the Rough.' Harvard Business School Case 703-027. Boston, MA: Harvard Business School.
- Araujo, J., G.L. Bin, M. Poplawski-Ribeiro, and L.-P. Zanna (2012). 'Current Account Norms in Natural Resource Rich and Capital Scarce Economies'. Unpublished Manuscript. Washington, DC: International Monetary Fund.
- Arezki R. (2011). 'Fiscal Policy in Commodity-Exporting Countries: Stability and Growth'. In R. Arezki, T. Gylfason, and A. Sy (eds). *Beyond the Curse: Policies to Harness the Power of Natural Resources*. Washington, DC: International Monetary Fund.
- Barnett, S., and R. Ossowski (2003). 'Operational Aspects of Fiscal Policy in Oil-Producing Countries'. In J. Davis, J. Ossowski, and A. Fedelino (eds), *Fiscal Policy Formulation and Implementation in Oil-Producing Countries*. Washington, DC: International Monetary Fund. <https://doi.org/10.5089/9781451858884.001>

- Bateman, M., and H.-J. Chang (2012). 'Microfinance and the Illusion of Development: from Hubris to Nemesis in Thirty Years'. *World Economic Review*, 1: 13–36.
- Bauer, A. (2014). 'Fiscal Rules for Natural Resource Funds: How to Develop and Operationalize an Appropriate Rule'. Policy Brief. New York: Revenue Watch Institute, Vale Columbia Center on Sustainable International Investment.
- Bauer, A. (2015). 'Six Reasons Why Sovereign Wealth Funds Should Not Invest or Spend at Home'. Natural Resource Governance Institute, 7 April. Available at: <https://resourcegovernance.org/blog/six-reasons-why-sovereign-wealth-funds-should-not-invest-or-spend-home-0> (accessed 13 August 2020).
- Bauer, A., and M. Rietveld (2014). 'Institutional Structure of Natural Resource Funds'. New York: Revenue Watch Institute, Vale Columbia Center on Sustainable International Investment.
- Bawumia, M., and H. Halland (2017). 'Oil Discovery and Macroeconomic Management: the Recent Ghanaian Experience'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, pp. 220–43. Oxford: Oxford University Press. <https://doi.org/10.1596/1813-9450-8209>
- Bems, R. and I. de Carvalho Filho (2011). 'The Current Account and Precautionary Savings for Exporters of Exhaustible Resources' *Journal of International Economics*, 84(1): 48–64. <https://doi.org/10.1016/j.jinteco.2011.02.004>
- Berg, A., R. Portillo, S.C. Yang, and L.F. Zanna (2012). 'Public Investment in Resource-Abundant Developing Countries'. IMF Working Paper WP/12/274. Washington, DC: International Monetary Fund. <https://doi.org/10.5089/9781475535563.001>
- Biedermann, Z. (2018). 'Africa's Dependency Curse: the Case of Botswana'. *Review of African Political Economy*, 27 September. Available at: <http://roape.net/2018/09/27/africas-dependency-curse-the-case-of-botswana/> (accessed 13 August 2020).
- Brautigam, D., O.H. Fjeldstad, and M. Moore (2008). *Taxation and State-Building in Developing Countries: Capacity and Consent*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511490897>
- Cammett, M.C., and I. Diwan (2016). 'Resource Wealth, Political Settlement, and Governance in the Middle East'. Paper presented at the Resources, Governance, and Development: The Middle East in Comparative Perspective workshop, Oxford University, on 20 January.
- Cammett, M.C., I. Diwan, A. Richards, and J. Waterbury (2015). *A Political Economy of the Middle East*, 4<sup>th</sup> Ed. Boulder, CO: Westview Press.
- Chang H.-J. (2007). 'State-Owned Enterprise Reform'. United Nations DESA National Development Strategies Policy Notes. New York: United Nations Department of Economic and Social Affairs.
- Cherif, R., and F. Hasanov (2012). 'Oil Exporters' Dilemma: How Much to Save and How Much to Invest'. IMF Working Paper WP/12/4. Washington, DC: International Monetary Fund. <https://doi.org/10.5089/9781475502459.001>
- Cherif, R., and F. Hasanov (2014). 'Soaring of the Gulf Falcons: Diversification in the GCC Oil Exporters in Seven Propositions'. IMF Working Paper WP/14/177. Washington, DC: International Monetary Fund. <https://doi.org/10.5089/9781498310642.001>
- Collier, P., and C. Laroche (2015). 'Harnessing Natural Resources for Inclusive Growth'. Growth Brief, March. London: International Growth Center. Available at: <https://www.theigc.org/wp-content/uploads/2015/03/IGCGrowthBriefNRMCollier20151.pdf> (accessed 13 August 2020).
- Collier, P., R. van Der Ploeg, M. Spence, and A.J. Venables (2010). 'Managing Resource Revenues in Developing Economies'. *IMF Staff Papers*, 51(7): 84–118. Washington, DC: International Monetary Fund. <https://doi.org/10.1057/imfsp.2009.16>
- Crivelli, E., and S. Gupta (2014). 'Resource Blessing, Revenue Curse? Domestic Revenue Effort in Resource-Rich Countries'. IMF Working Paper 14/5. Washington, DC: International Monetary Fund. <https://doi.org/10.5089/9781484351178.001>



- Cust, J.F., and D. Mihalyi (2017). 'The Presource Curse'. *Finance & Development*, 54(4): 37–40.
- Davis, J., R. Ossowski, J. Daniel, and S. Barnett (2003). 'Stabilization and Savings Funds for Nonrenewable Resources'. In J. Davis, R. Ossowski, and O. Fedelino (eds), *Fiscal Policy Formulation and Implementation in Oil-Producing Countries*. Washington, DC: International Monetary Fund.
- Devarajan, S. (2019). 'How to Use Oil Revenues Efficiently'. In K. Mohaddes, J.B. Nugent, and H. Selim (eds), *Institutions and Macroeconomic Policies in Resource-Rich Arab Economies*. Oxford: Oxford University Press. <https://doi.org/10.1093/oso/9780198822226.003.0008>
- Di John, J. (2009). *From Windfall to Curse? Oil and Industrialization in Venezuela, 1920 to the Present*. University Park, PA: Penn State University Press.
- Eubank, N. (2012). 'Taxation, Political Accountability and Foreign Aid: Lessons from Somaliland'. *Journal of Development Studies*, 48(4): 465–80. <https://doi.org/10.1080/00220388.2011.598510>
- Friedman, M. (1957). *The Permanent Income Hypothesis: A Theory of the Consumption Function*. New Jersey: Princeton University Press.
- Gale, B. (1981). 'Petronas: Malaysia's National Oil Corporation'. *Asian Survey*, 21(11): 1129–44. <https://doi.org/10.2307/2643998>
- Gelb, A. (2010). 'Economic Diversification in Resource-Rich Countries'. Lecture at seminar on 'Natural Resources, Finance, and Development: Confronting Old and New Challenges', organized by the Central Bank of Algeria and the International Monetary Fund Institute in Algiers, 4–5 November.
- Gelb, A., and S. Grasmann (2009). 'Déjouer la malédiction pétrolière'. *Afrique contemporaine*, 229(1): 87–135. <https://doi.org/10.3917/afco.229.0087>
- Gelb, A., et al. (1988). *Oil Windfalls – Blessing or Curse?* Washington, DC: World Bank. Available at: <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/536401468771314677/oil-windfalls-blessing-or-curse> (accessed 13 August 2020).
- Gelb, A., S. Tordo, and H. Halland (2014a). 'Sovereign Wealth Funds and Domestic Investment in Resource-Rich Countries: Love Me, or Love Me Not?' World Bank Economic Premise Series, 133: 1–5. Available at: [https://www.researchgate.net/publication/320536332\\_Sovereign\\_Wealth\\_Funds\\_and\\_Domestic\\_Investment\\_in\\_Resource-Rich\\_Countries\\_Love\\_Me\\_or\\_Love\\_Me\\_Not](https://www.researchgate.net/publication/320536332_Sovereign_Wealth_Funds_and_Domestic_Investment_in_Resource-Rich_Countries_Love_Me_or_Love_Me_Not) (accessed 13 August 2020).
- Gelb, A., S. Tordo, H. Halland, N. Arfaa, and G. Smith (2014b). 'Sovereign Wealth Funds and Long-Term Development Finance: Risks and Opportunities'. World Bank Policy Research Working Paper 6776. Washington, DC: World Bank. <https://doi.org/10.1596/1813-9450-6776>
- Grynberg, R., M. Sengwaketse, and M. Motswapong (2015). *Botswana after Diamonds: a Study into the Consequences [of] and Responses to the Depletion of Botswana's Diamonds*. Gaborone, Botswana: Mmegi Publishing House on behalf of the Botswana Institute for Development Policy Analysis.
- Hartwick, J.M. (1978). 'Substitution among Exhaustible Resources and Intergenerational Equity'. *The Review of Economic Studies*, 45(2): 347–54. <https://doi.org/10.2307/2297349>
- Henstridge, M., and A. Roe (2018). 'The Macroeconomic Management of Natural Resources'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, pp. 161–78. Oxford: Oxford University Press. <https://doi.org/10.1093/oso/9780198817369.003.0008>
- International Forum of Sovereign Wealth Funds (2018). 'Botswana – Pula Fund'. Available at: [www.ifswf.org/file/821/download?token=GoNe5ggo](http://www.ifswf.org/file/821/download?token=GoNe5ggo) (accessed 19 August 2020).
- International Monetary Fund (2018). *The Diversification Toolkit: Export Diversification and Quality Databases*. Available at: <https://www.imf.org/external/np/res/dfidimf/diversification.htm> (accessed 13 August 2020).



- Isaksson, A. (2009). 'Public Capital, Infrastructure and Industrial Development'. UNIDO Working Paper 15/2009. Vienna: United Nations Industrial Development Organization, Research and Statistics Branch.
- Jewell, A. (2016). 'The Need for Subsidy Reform in Algeria'. IMF Blog. Washington, DC: International Monetary Fund. Available at: <https://www.imf.org/external/np/blog/nafigda/083116.pdf> (accessed 13 August 2020).
- Khan, M. (2007). 'Governance, Economic Growth and Development since the 1960s'. DESA Working Paper 54 ST/ESA/2007/DWP/54. New York: UN Department of Economic and Social Affairs.
- Lahn, G., and P. Stevens (2018). 'Re-evaluating What We Know about Extractives and Economic Development'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, pp. 93–113. Oxford: Oxford University Press.
- Le Matin d'Algérie (2017). 'Le Fonds de régulation des recettes épuisé depuis février'. 8 September. Available at: [www.lematindz.net/news/25295-les-fonds-de-regulation-des-recettes-epuise-depuis-fevrier.html](http://www.lematindz.net/news/25295-les-fonds-de-regulation-des-recettes-epuise-depuis-fevrier.html) (accessed 19 August 2020).
- Lebdioui, A. (2019a). 'Economic Diversification and Development in Resource-Dependent Economies: Lessons from Chile and Malaysia'. PhD Thesis. University of Cambridge, Centre of Development Studies. <https://doi.org/10.17863/CAM.46517>
- Lebdioui, A. (2019b). 'Chile's Export Diversification since 1960: A Free Market Miracle or Mirage?'. *Development and Change*, 50(6): 1624–63. <https://doi.org/10.1111/dech.12545>
- Leith, J.C. (2005). *Why Botswana Prospered*. Montreal: McGill-Queen's Press.
- Malik A. (2016). 'Beyond the Resource Curse: Rents and Development'. In I. Diwan and A. Galal (eds), *The Middle East Economies in Times of Transition*. International Economic Association Series. London: Palgrave Macmillan.
- McKinsey (2016). *Moving Saudi Arabia's Economy beyond Oil*. McKinsey & Company. Available at: [www.mckinsey.com/global-themes/employment-and-growth/moving-saudi-arabias-economy-beyond-oil](http://www.mckinsey.com/global-themes/employment-and-growth/moving-saudi-arabias-economy-beyond-oil) (accessed 13 August 2020).
- Mohaddes, K., and M. Raissi (2017). 'Do Sovereign Wealth Funds Dampen the Negative Effects of Commodity Price Volatility?'. *Journal of Commodity Markets*, 8: 18–27. <https://doi.org/10.1016/j.jcomm.2017.08.004>
- Monk, A. (2013). 'The Rise of Sovereign Development Funds'. *Institutional Investor*. Available at: <https://www.institutionalinvestor.com/article/b14zbd0psln27f/the-rise-of-sovereign-development-funds> (accessed 13 August 2020).
- Moore, M., and Rakner, L. (2002). 'Introduction: The New Politics of Taxation and Accountability'. *IDS Bulletin*, 33(3): 1–9.
- North, D.C., J.J. Wallis, and B.R. Weingast (2009). *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511575839>
- O'Sullivan, A., M.-E. Rey, and J.G. Mendez (2012). 'Opportunities and Challenges in the MENA Region'. In *Arab World Competitiveness Report 2011–2012*, pp. 43–67. Paris: Organisation for Economic Co-operation and Development.
- OECD (2016). *Resource Revenue Earmarking: Comparative Analysis And Lessons Learned*. Paris: Organisation for Economic Co-operation and Development.
- Petrie, M. (2010) 'Promoting Public Investment Efficiency: a Synthesis of Country Experiences'. Paper presented at the World Bank Workshop 'Promoting Public Investment Efficiency; Global Lessons and Resources for Strengthening World Bank Support for Client Countries', Washington, DC, 7 July.
- Pritchett, L. (2000). 'The Tyranny of Concepts: CUDIE (Cumulated, Depreciated, Investment Effort) Is Not Capital'. *Journal of Economic Growth*, 5: 361–84. <https://doi.org/10.1023/A:1026551519329>

- Rajaram, A., M.L. Tuan, L. Kai, K. Jay-Hyung, and F. Jonas (eds) (2014). *The Power of Public Investment Management: Transforming Resources into Assets for Growth*. Washington, DC: World Bank.
- Robinson, J.A., and R. Torvik (2005). 'White elephants'. *Journal of Public Economics*, 89: 197–210.
- Ross, M. (1999). 'The Political Economy of Resource Curse'. *World Politics*, 51 (January): 297–322. <https://doi.org/10.1017/S0043887100008200>
- Sachs, J.D. (2007). 'How to Handle the Macroeconomics of Oil Wealth?' In M. Humphreys, J.D. Sachs, and J.E. Stiglitz (eds), *Escaping the Resource Curse*, pp. 173–94. New York: Columbia University Press.
- Sachs, J.D., and A.M. Warner (1995). 'Natural Resource Abundance and Economic Growth'. NBER Working Paper 5398. Cambridge, MA: National Bureau of Economic Research. <https://doi.org/10.3386/w5398>
- Sarraf, M., and M. Jiwani (2001). 'Beating the Resource Curse: The Case of Botswana'. Environment Department Working Paper 83. Environmental Economics Series. Washington, DC: World Bank.
- Solimano, A., and D. Calderón Guajardo (2017). 'The Copper Sector, Fiscal Rules, and Stabilization Funds in Chile: Scope and Limits'. WIDER Working Paper 2017/53. Helsinki: UNU-WIDER. <https://doi.org/10.35188/UNU-WIDER/2017/277-9>
- Takizawa, H., E.H. Gardner, and K. Ueda (2004). 'Are Developing Countries Better Off Spending Their Oil Wealth Upfront?' IMF Working Paper WP/04/141. Washington, DC: International Monetary Fund.
- Torvik, R. (2011). 'The Political Economy of Reform in Resource-Rich Countries'. In R. Arezki, T. Gylfason, and A. Sy (eds), *Beyond the Curse: Policies to Harness the Power of Natural Resources*. Washington, DC: International Monetary Fund.
- Truman, E.M. (2011). 'Sovereign Wealth Funds: Is Asia Different?'. Working Paper 11-12. Washington, DC: Peterson Institute. <https://doi.org/10.2139/ssrn.1898787>
- UN COMTRADE (2020). 'International Trade Statistics Database'. Available at: <https://comtrade.un.org/>
- van der Ploeg, F., and A.J. Venables (2011). 'Harnessing Windfall Revenues: Optimal Policies for Resource-Rich Developing Economies'. *The Economic Journal*, 121(551): 1–30. <https://doi.org/10.1111/j.1468-0297.2010.02411.x>
- van der Ploeg, F., and A.J. Venables (2018). 'Extractive Revenues and Government Spending: Short- Versus Long-term Considerations'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, pp. 161–78. Oxford: Oxford University Press. <https://doi.org/10.1093/oso/9780198817369.003.0008>
- Van Wijnbergen, S. (1984). 'The Dutch Disease: a Disease after All?'. *The Economic Journal*, 94(373): 41–55.
- Venables, A.J. (2010). 'Resource Rents: When to Spend and How to Save'. *International Tax and Public Finance*, 17: 340–56. <https://doi.org/10.1007/s10797-010-9137-9>
- Witter, S., and M. Jakobsen (2018). 'Choices for Spending Government Revenue: New African Oil, Gas, and Mining Economies'. In T. Addison and A. Roe (eds), *Extractive Industries: The Management of Resources as a Driver of Sustainable Development*, pp. 547–67. Oxford: Oxford University Press. <https://doi.org/10.35188/UNU-WIDER/2017/376-9>
- World Bank (2011). *The Changing Wealth of Nations: Measuring Sustainable Development in the New Millennium*. Washington, DC: World Bank.
- World Bank (2013). *Malaysia Economic Monitor: Harnessing Natural Resources*. Washington, DC: World Bank. Available at: [www.worldbank.org/content/dam/Worldbank/document/EAP/malaysia/Malaysia\\_Economic\\_Monitor\\_June2013.pdf](http://www.worldbank.org/content/dam/Worldbank/document/EAP/malaysia/Malaysia_Economic_Monitor_June2013.pdf) (accessed 13 August 2020).
- World Bank (2019). 'World Development Indicators'. Available at: <https://data.worldbank.org>.
- World Economic Forum (2018). *Thinking Strategically: Using Resource Revenues to Invest in a Sustainable Future*. Geneva: World Economic Forum.