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Managing Natural Resources for Growth and Prosperity in Low Income Countries

Hinh T. Dinh & Russel Dinh

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About the authors

Hinh T. Dinh is currently Senior Fellow at OCP Policy Center. He is also a Visiting Scholar at the John Hopkins University School of Advanced International Studies and President and CEO, Economic Growth and Transformation, Inc. Previously he spent over 35 years working at the World Bank Group which he joined through its Young Professionals Program. He was a Lead Economist in the Office of the Senior Vice President and Chief Economist of the World Bank (2009-2014), the Africa Region (1998-2009), the Finance Complex (1991-1998), and the Middle East and North Africa Region (1978-1991).

Russel Dinh has undergraduate and graduate degrees in Economics, Chemistry, and Physiology from the University of Virginia (2011) and Georgetown University (2012). He is currently pursuing an MD degree at Virginia Commonwealth University School of Medicine in Richmond, Virginia. Previously he was a research analyst at Gryphon Scientific, where he contributed to rigorous scientific analysis applied to global health in developing nations and national security resource allocation.

The views expressed in this publication are those of the author.

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Abstract

This paper reviews the economic impact of natural resources on low-income countries and the policy options available to them as recommended by academia and international organizations. We find that traditional policy prescriptions are unrealistic and miss a number of issues that include what to do when resources are depleted, job creation for growth and prosperity, and heterogeneity in country conditions. The paper proposes to reconcile these problems by advocating a strategy based on new structural economics, with a special focus on economic growth and job creation using the proceeds of natural resources. This approach combines “learning by doing” with targeted public investment in order to develop infrastructure and human capital. For many low-income countries, development of simple, labor-intensive light manufacturing is the recommended path. This recommendation is elaborated in a case study of South Sudan, a poor, resource-rich country in Africa.

Keywords: Managing natural resources, low-income countries, Dutch disease, industrialization

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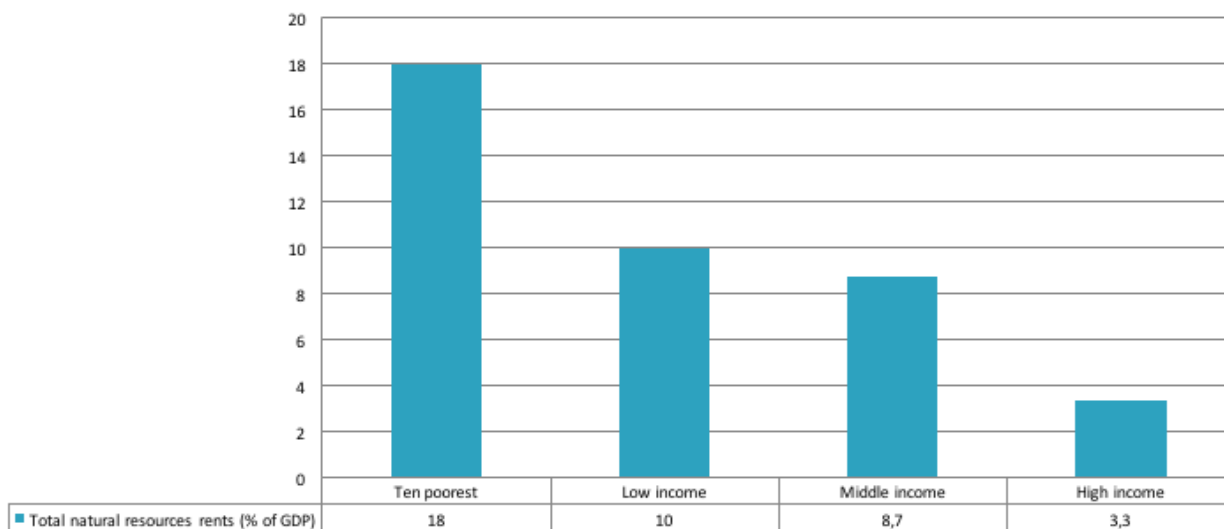
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Introduction¹

The 10 poorest countries in the world today derive on average 18 percent of their incomes from natural resources rents,² compared to 10 percent for low income countries, 8.7 percent for middle income countries, and 3.3 percent for high income countries (World Bank, 2014). Of these 10 countries, four derive over 20 percent and two derive over 30 percent. Many of these countries show the same dependency on natural resources rents today as they did 30 years ago, suggesting the presence of a resource curse creating a dependency cycle on these sources of rent (Sachs & Warner, 2001).

Figure 1: Natural resource rents (% of GDP)



Source: World Bank WDI (2015)

Behind these numbers lies an even more troubling trend. First, the same poor countries, mostly in Africa, have been resource dependent over the past three or four decades. The economic policies these countries have adopted over the period have not supported the diversification of resources. Policy prescriptions given to these countries, provided from academia to international institutions, have been the same, with disappointing results. Moreover, after 40 years of reforms, more and more countries appear to be resource dependent, which makes new policy more urgent than ever.

1. All data in this paper are based on the latest year at the time the research is conducted (2015). The definition of natural resources (see the next footnote) follows the latest research results pioneered by international institutions such as the World Bank (2011).

2. Natural resources rents are defined as revenues above the cost of extracting natural resources. WDI (2015) points out that natural resources give rise to economic rents because they are not produced. Rents from nonrenewable resources indicate the liquidation of a country's capital stock. When countries use these rents to support current consumption rather than to invest in new capital to replace what is being used, they are, in effect, borrowing against their future.

Table 1 shows the least developed countries in the world in 1970 and in 2012, along with their natural resource rent defined as a percentage of GDP and their per capita income. Two disturbing trends are striking from this table. First, over the course of four decades, the vast majority of these least developed countries remain African nations, and very much the same countries. Second, the ten least developed countries are heavily dependent on natural resources, a trend that has increased over the years.

Table 1: Least Developed Countries and Their Natural Resource Dependency

	Nat. Res. Rent	GNI/pc		Nat. Res. Rent	GNI/pc
	as % of GDP	(US\$)		as % of GDP	(US\$)
Country Name	1970	1970	Country Name	2012	2012
Malawi	5.7	60	Burundi	23.4	240
Rwanda	7.3	60	Malawi	9.8	320
Burundi	5.8	70	Liberia	26.2	370
Mali	3.5	70	Niger	9.1	390
Nepal	7.0	80	Congo, Dem. Rep.	33.4	400
Burkina Faso	5.8	90	Ethiopia	13.8	420
Indonesia	9.9	90	Madagascar	8.9	430
Lesotho	8.0	90	Guinea	30.1	440
Somalia	4.1	90	Eritrea	15.5	450
Cent. Afr. Republic	7.0	110	Uganda	12.2	480
Gambia, The	2.0	110	Cent. Afr. Republic	8.5	490
Benin	5.8	120	Togo	9.0	490
India	2.3	120	Gambia, The	5.2	520
China	1.7	120	Sierra Leone	8.6	520
Togo	5.5	130	Mozambique	12.1	540
Kenya	2.8	130	Tanzania	11.6	570
Chad	3.4	140	Guinea-Bissau	17.8	590
Niger	1.8	150	Rwanda	5.5	610
Sudan	0.0	150	Mali	16.1	660
Botswana	2.7	150	Burkina Faso	22.1	670

Source: World Bank WDI 2015

Van der Ploeg (2011) noted that countries from OPEC to Bolivia to Columbia, and to South Africa all had poor growth from commodity boom. Indeed, Botswana, a country often touted as a poster child of the developing world in terms of managing natural resources, is suffering from high structural unemployment, high income inequality (Gini coefficient over 60%), and high poverty rate (19 %). Moreover, driven by the decline in TFP growth, trend growth has slowed down amidst persistently high rate of structural unemployment. The skill mismatch in the labor market remains a perennial challenge despite significant resources invested by the government in education³.

Gylfason (2001) noted that of the 65 resource rich, developing countries, only four managed to achieve long-term investment exceeding 25 percent of GDP and an average GDP growth exceeding 4 per cent, namely Botswana, Indonesia, Malaysia and Thailand (Gylfason, 2001). The three resource rich Asian countries have achieved this by economic diversification and industrialization. Still, they did not fare as well as their neighbors: Hong Kong, Singapore and South Korea, countries with little raw material wealth.

3. <http://www.imf.org/external/pubs/ft/scr/2014/cr14204.pdf>

Gilfason points out four channels through which an abundance of natural resources can transmit to poor economic growth:

- Resource effects caused by the Dutch disease: oil revenues drive up domestic prices and real wages, making the agricultural and industrial sectors uncompetitive in the world (Corden 1984).
- Rent seeking: unlike other sources of government revenues, rent from the oil sector is prone to rent-seeking behaviors, leading to corruption.
- A false sense of security from resource abundance creates neglect toward policy development.
- Negligence affects human resource development.

As noted in *The Changing Wealth of Nations* (World Bank 2011), most countries at the bottom of the economic ladder start out with a high dependence on natural capital. As they move up the economic rungs, they use these assets to build more wealth, especially in the form of produced and intangible capital. Transforming natural capital into other forms of wealth is the path to sustainable development. Higher-income countries also have higher per capita natural capital— about six times that of low-income countries. The potential for raising low-income countries' per capita natural capital lies in the discovery of subsoil assets and in better management of all types of natural capital.

What are today's policy options available to a poor country that happens to have abundant resources? What are the possible policy differences between a poor country endowed with natural resources and one that is not? What do the theory and practice tell us and why is it that poor countries remain resource dependent after so many decades of development? These are the questions the paper will attempt to shed lights on.

Resource dependency is defined in terms of natural resource rents, a concept used by the World Bank (1995, 2005, 2011) or by primary exports, following Sachs and Warner (1995). To keep these two concepts compatible, the paper will solely focus on energy and mineral resources, and not include forestry and land. Because these non-renewable resources are also considered point-source rather than diffused, this distinction will facilitate the discussion on the political economy later on.

Overview of Current Literature

While the effects of natural resources on an economy were long recognized by John Stuart Mills in his *Principles of Political Economy* (1848) where he addressed the adverse effects of natural resources on labor supply and institutional quality (cited by Boianovsky 2013), and by Furtado (1957) and Seers (1964), it was not until the 1980s that these effects were fully discussed (Corden and Neary 1982, Van Wijnbergen 1984, Gelb 1988). The resource curse was described by Richard Auty in 1993, and a few years later Sachs and Warner presented their breakthrough econometric analysis of the negative relationship between resource dependence and economic growth (Sachs & Warner, 1995). Controlling for a number of factors such as geography, climate, government efficiency, economic growth, per capita income, trade policy, and investment rates, the authors systematically analyze evidence that resource abundant countries fall short in the realm of export led growth when compared to resource poor economies (Sachs & Warner, 1997a, 2001).

Sachs and Warner's classic study finds that, after controlling for initial income per capita, investments in physical and human capital, trade openness, and rule of law, natural resource dependence (measured by the ratio of natural resource exports to GDP) has a strong and significant negative effect on the growth of GDP per capita (column 1, table 1). Re-estimation with institutional quality rather than the rule of law confirms the presence of a resource curse (column 2, table 1). These results suggest that, *ceteris paribus*, an increase in the ratio of resource exports to GDP of 10 percentage points depresses average growth in GDP per capita from 0.77 to 1.1 percent per annum.

Figure 2: Growth per capita vs natural resource abundance

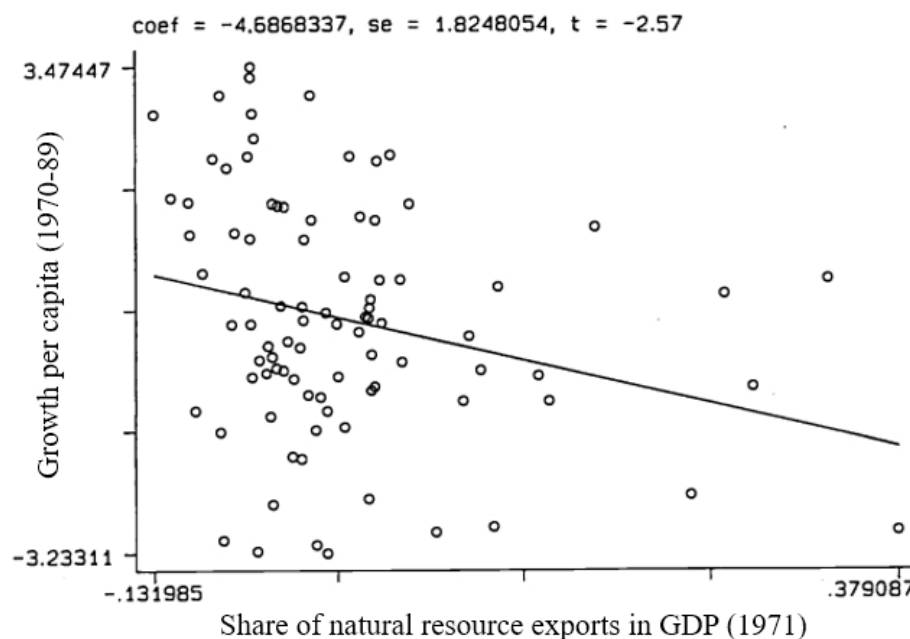


Figure 2 from Sachs & Warner's eminent work *Natural Resource and Economic Abundance* (1995) showing the growth per capita between 1970 and 1989 and the share of natural resource export to GDP controlling for initial income and global economy integration.

Over the past decade, dozens of studies reiterate and expand upon the surprising economic feature of abundant natural resources and slow economic growth. Authors sought not only to econometrically verify the trend, but also explain its cause. Theories have been developed for decades including the rate of resource extraction given by Hotelling's rule, resources management to keep welfare constant by Hartwick's rule, and also the various effects of natural resources on the national economies (Barbier, 2005; Corden, 1984; Matsuyama, 1992; Van Wijnbergen, 1984).

Most studies in the late 1990s and the early 2000s confirmed the pioneer work done by Sachs and Warner (1995, 1997, 2001), which shows a negative relationship between resource dependence and growth. Auty (2001) explains this oddity in terms of the political capture of rent, while Gylfason (2001) points to low investment in human resources, among other factors. Hausmann and Rigobon (2003) find that resource rich countries are affected by economic shocks, while Collier and Hoeffler (2005) find that resource rich countries are vulnerable to armed conflicts.

Mehlum et al. (2006) and Boschini et al. (2007) offer empirical support for the hypothesis that countries with good institutions receive a very modest growth effect from resource dependence, while those with bad institutions are adversely affected. Increasing the ratio of natural resource exports to GDP by 10 percentage points increases average growth by a mere 0.1 percent per annum in countries with good institutions (a weighted index of various indicators measured on a scale from zero to one) but decreases annual growth by 1.43 percent in countries with bad institutions. The effects of oil curse is not symmetrical across countries with varying quality of institutions.

Since the mid-2000s, a number of studies appear to run counter to previous beliefs on the resource curse. Many have isolated certain conditions and attempted to provide evidence that natural resources have a non-negative effect on growth (Alexeev & Conrad, 2009; Boschini, Pettersson, & Roine, 2013; Ebeke & Ngouana, 2015; James, 2015; Lederman and Maloney 2007, Mehlum, Moene, & Torvik, 2006; J. Stijns, 2006; J. C. Stijns, 2005; Torvik, 2009; Williams, 2011). For instance, Mehlum, Moene, and Torvik (2006) described a discrepancy in quality of institution and impact of resource curse. A stronger government with monetary support and political stability is able to mitigate negative economic effects more easily. In particular, Lederman and Maloney (2008) argued that Sachs and Warner's use of natural resource indicator (exports as a share of GDP) does not capture a country's factor endowments. When they replicate Sachs and Warner results using a net measure of resource exports, the negative impact of natural resources on growth disappears. James (2015) went so far as to label the resource curse a statistical mirage. He reasoned that the resource curse phenomenon can be explained by the average sector growth heterogeneity of resource abundant countries (James 2015). But this conclusion has been long discussed: commodity price volatility contributes to the negative impact of the resource curse.

Lederman and Maloney reject the resource curse claim since, they argue, resource abundance leads to neither curse nor blessing. To them, the resource curse is a myth, much like Dracula. They listed the transmission channels of the curse before proceeding to dismiss them; a) prices of natural resources tend to decline relative to those of manufacturing; ii) natural resources tend to lead to lower human and physical capital accumulation and lower productivity; iii) they lead to large price volatility; and iv) they lead to institutional weaknesses. Lederman and Maloney dismiss the first channel on the basis that commodity prices follow random shocks and that future demand from emerging economies such as China and India will keep their prices high. On the second, they argue that a previous study showed higher productivity in agriculture than manufacturing (ignoring the fact that agriculture and exhaustible

natural resource are not the same thing) and that it was the complementary policies dealing with human resources etc. that are deficient. On the third point, they argue that natural resources are no different than manufacturing or services. Finally on the last point, they claim that natural resources are no different than foreign aid or natural monopolies such as telecom.

Lederman and Maloney's counterpoints are not valid for a number of reasons. First, there is nothing in their arguments that denies that natural resources, as a rule, cause more adverse effects on economic management of an economy than services or manufacturing. For a low income country with all the attendant development issues, this stretches the administrative capacity to the limit. Second, the confusion between agriculture and non-renewable natural resources weakens the argument. Third, the two countries they cited as successful cases, Botswana and Chile, are more an exception among the developing countries blessed with natural resources. Advanced countries such as the Netherland, Norway, and UK were already developed when oil and natural gas were discovered. Countries such as Australia and the US developed on the back of natural resources thanks to their ability to channel natural resource abundance into first domestic industries, then domestic technologies, and subsequently human capital (Gavin Wright 1990). Finally, the long term (but finite) nature of natural resources makes their perception by policy makers and citizens different from other short-term sources such as foreign aid.

A more comprehensive review of this body of research, outside the scope and unnecessary to this paper, has been documented by Frankel (2010) and Van der Ploeg (2011). In all, the literature deeply analyzes the presence and ubiquity of the resource curse, but it falls short when discussing pragmatic policy options. Later, we will lay out these policies and suggest an alternate set of solutions to not only mitigate the negative impacts of the resource curse but also to replace this ephemeral source of income with a sustained revenue stream.

Differentiation and purpose: This paper seeks to make three contributions to this body of knowledge. First, we focus the discussion on the policy options available to the low income countries where capacity is weak to see if the theories developed so far have offered any concrete guidance for policy makers. Second, the paper stresses the role of economic growth and job creation in poor countries abundant in natural resources. This growth and employment aspect can offer a key link to why natural resources often do not lead to higher prosperity for poor countries. The sector that offers the most exports and revenues employs very few workers, even at high wages. Third, we discuss a viable policy option aimed at directly addressing the key issue for these countries: how to replace these natural resources when they are depleted. The case study of South Sudan is used to illustrate these contributions and also to show the gap between theory and practice. Before concluding we discuss the case of new emerging resources and the steps needed to prepare for expected future windfalls.

Effects of Natural Resources on an Economy

The economic effects of natural resources on an economy are well-known and are not controversial. On the microeconomic side, Hotelling's work gives guidance on the sustainable rate of resource extraction to maximize the owner's welfare (Hotelling, 1931). With no extraction costs and constant elasticity of demand for resources, the Hotelling rule states that the capital gain on resources must equal the world interest rate. This is based on the arbitrage principle, i.e., one should be indifferent between keeping the resource under the ground (in which case the return is the capital gain on reserves) and extracting, selling and getting a market return on it. The rate of increase in marginal resource rents should thus equal the world interest rate. Since marginal extraction costs differ widely across countries, optimal depletion rates vary widely as well even if each country is a price taker.

Corden has neatly analyzed the various effects of resources on the tradeable and non-tradeable sectors (Corden, 1984). Natural resource wealth makes countries susceptible to Dutch disease, the term that originates from a crisis in the Netherlands in the 1960s that resulted from discoveries of vast natural gas deposits. In its broadest sense, Dutch disease refers to the over appreciation of the real exchange rate arising from natural resource boom, leading to a contraction of tradable sector, usually manufacturing sector (Corden & Neary, 1982; Corden, 1984)⁴.

During a resource boom, there will be a drastic rise in revenues from mineral exports, and consequently demand for domestically produced, non-traded goods and services will increase; this is known as the spending effect (Corden 1984). Since the government is likely to take a large share of mineral revenue, public spending often increases substantially. But deindustrialization occurs not only through the usual appreciation of real exchange rate (as a result of higher relative price of non-traded goods) but also due to resources, such as skilled labor, capital, public spending, etc, drawn from both tradable and non-tradable sectors to the mineral sector. This phenomenon, where growth in non-mineral sectors is depressed, was dubbed the resource movement effect (Corden & Neary, 1982). The movements of resources away from the non-mineral sectors indicate that the mineral sector has a crowding out effect on these sectors through its economic dominance on domestic resources. The impact seems more pronounced in small economies where the size of the investment (government) projects is large.

The increased demand for non-tradable goods and services will push their prices to rise, resulting in higher costs of inputs for the rest of the economy particularly the exporting sectors. Also, since technological progress is faster in the tradable sectors than non-tradable sectors, the explanation of poor economic performance logically follows. Since the mineral sector uses less input goods and its dependence on domestically produced goods is particularly low, other sectors like manufacturing and agriculture will lose their profits and competitiveness vis-à-vis imports. Consequently, this weakens the competitiveness of the non-mineral sectors leading to declining diversification in the economy. There will also be skilled labor influx to the mineral sector from the sectors exposed to international competition, which cannot afford to pay higher wages. Ultimately, non-mineral export sector will contract, the public sector excessively will expand and inflation will rise.

The shift away from manufacturing sector can be detrimental to growth. If natural resources begin

4. Dutch disease can also result from any large increase in foreign currency, including foreign aid, foreign direct investment, or a substantial increase in natural resource prices.

to exhaust or commodity prices fall, competitive manufacturing industries may not be able to return to previous levels of productivity quickly enough. This is because technology grows at a much slower pace in the mineral sector and the non-tradable sector than the non-mineral tradable sector. Also, the country's comparative advantage in non-mineral tradable goods will decline, and hence prevents firms from investing in the tradable sector.

Impact on revenue volatility and uncertainty: Natural resource wealth exposes countries to the volatility due to the extreme volatile nature of the international commodity prices. Resource rich countries are more vulnerable to commodity price volatility and exchange rate volatility. Since such volatility acts as tax on investment in tradable goods production, mainly in agriculture and manufacturing, mineral income dependency could affect growth adversely.

Most mineral rich countries follow passive fiscal policies. In general, public expenditure in resource rich countries is highly associated with current mineral revenue. Consequently, the share of public expenditure in non-mineral GDP is also highly volatile. Linking public expenditure to current mineral revenue would also create some openings for wasteful spending and low return to public investments. Most investments made during the commodity boom, following the rise in current revenue, are associated with projects that are most likely beyond the country's capacity to absorb in terms of maintaining the new projects while commodity prices drop. Furthermore, when commodity prices suddenly fall, downsizing public expenditure is often difficult and costly. At the same time, the need to reduce expenditure could be higher than the actual fall in mineral revenue triggered by commodity prices fall. This is due to the fact that most resource rich countries have unique problem with access to capital market, as their need to borrow depends on commodity prices. When prices are high, they tend to borrow less, but their borrowing capacity is inversely related to their borrowing need, as the value of their collateral (mineral wealth) depends on the prices. Therefore, access to capital market will be more difficult when it is most needed.

Volatility of this nature can be considered as tax on investment, since volatile relative prices depress long term irreversible commitments to specific sectors (Van Wijnbergen, 1984). There is empirical evidence that relates low productivity growth with high volatility, particularly in countries with a relatively underdeveloped financial sector (Aghion & Banerjee, 2005). According to this study, a 50 percent increase in volatility slows down productivity growth by 33 percent on average. There is ample empirical evidence that indicate mineral rich countries are more volatile economies than mineral poor countries (Hausmann & Rigobon, 2003). It is thus imperative to suggest that volatility is one of the key factors for the poor performance of some of mineral rich countries.

Commodity prices fluctuation can also affect the level and changes in real exchange rate. The main channel through which price volatility affects real exchange rate is pro-cyclical government spending on non-tradable sector. Loss of revenue is also another factor that affects real exchange rate. The impact on real exchange rate leaves policy makers to use other measures to compensate for loss of revenue. Such measures include import tariffs and other distorting taxes which in turn adversely affect the rest of the economy and capital formation (Serven & Solimano, 1993). Furthermore, failure to generate fiscal deficit when commodity price is favorable would cause the budget to be susceptible to adverse price shocks and that leads to adverse effect of fiscal policy on the rest of the economy. When prices drop governments tend to undertake swift and disruptive fiscal measures.

When commodity prices slump, most resource rich countries tend to borrow excessively to cover their

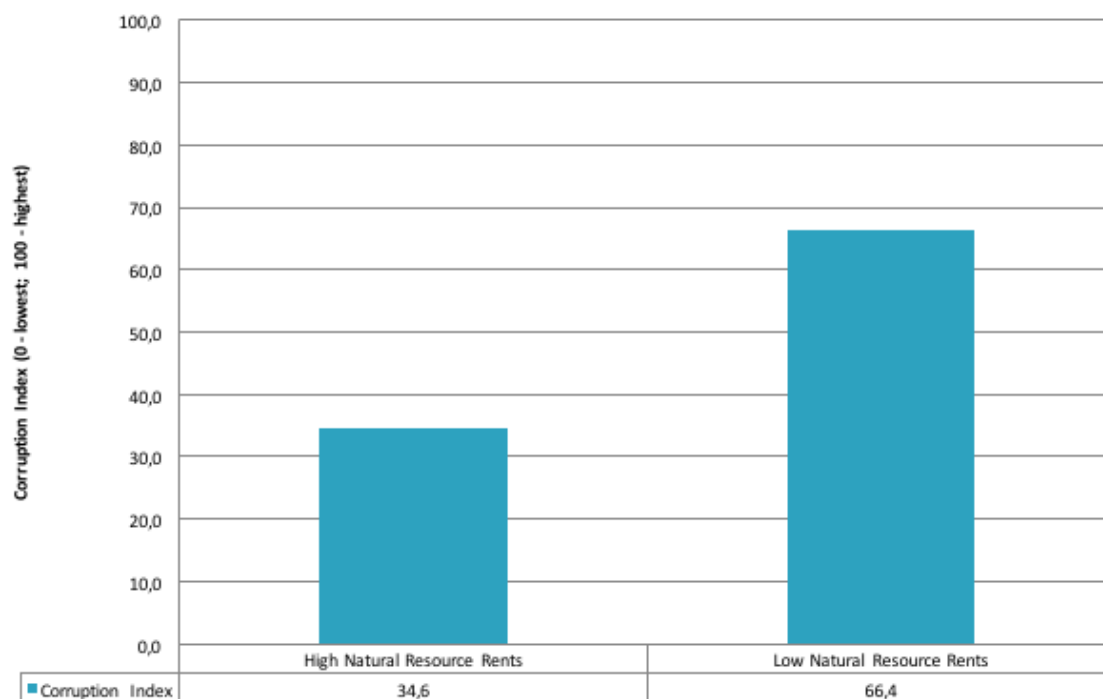
fiscal expenses. While resource windfalls – unexpected income gains – provide net wealth, it also creates additional spending room. This will complicate macroeconomic management and lead to high dependency on mineral resource, which is highly unstable source of income. A sudden reduction in net windfall revenue may well be associated with borrowing capacity, as lenders may reckon that a large share of project returns will be devoted to debt servicing of previous debt. Manzano and Rigobon (2001) have shown the potential link between debt and poor economic growth in resource rich countries. While the average external debt as a share of GDP in mineral rich countries is about 94 percent, the corresponding figure for non-mineral economies is 61 percent.

Weak governance: Resource wealth can undermine governance and create a vicious cycle. Natural resources generate rents which lead to greedy rent-seeking – the voracity effect. A variety of interest groups seek to overexploit windfall gains to at least partially offload adjustment costs to the rest of the economy while receiving the gains from its lobbying efforts (Lane and Tornell, 1995). Corruption and lack of transparency accompanied with continuing conflicts are also typical incidences in resource rich countries, and their adverse manifestation is felt through political economy effects (Leite & Weidmann, 1999; Mauro, 1995). Mineral wealth gives rise to governments that are less accountable to the people, have little concern to improve institutional capacity, and fail to implement policies conducive to sustainable growth.

Corruption remains epidemic in most resource rich countries. For instance, Angola and Nigeria, the two largest oil producer in Africa rank the 5th and 15th most corrupt countries in the world, while other resource rich countries like Botswana and Canada were ranked 76th and 97th (Kaufmann, Kraay, & Mastruzzi, 2009). These countries received huge amount of money from the sale of crude oil, while public institutions and infrastructure practically weakened. Resource rich developing countries are among the countries which scored poorly against governance indicators. In fact, almost all of the most 10 corrupt countries are resource rich countries, such as Equatorial Guinea (1st), Democratic Republic of Congo (3rd), Chad (4th), and Papua New Guinea (4th). Although bad governance might not be new to resource rich developing countries, a number of studies have shown the strong correlation between mineral wealth and corruption in these countries.⁵

5. More recent studies provide a different approach in explaining Nigeria's poor economic performance of mineral rich countries – the Nigerian Disease (Rosser, 2006). The author argues that abundance of natural resources leads to poorer governance and conflicts. Some of the outcomes associated with the Nigerian Disease are higher corruption, more rent-seeking activity, greater civil conflict, and the rapid decline in social capital.

Figure 4: Comparing corruption in the nations with high and low natural resource rents



Source: World Bank WDI (2015)

Note: The Corruption Index was developed by Transparency International, an international non-government group. “High Natural Resource Rents” was an average corruption index of the 11 highest natural resource rents (Average: 42.2% of GDP) that were rated by Transparency International. “Low Natural Resource Rents” was an average corruption index of the 11 lowest natural resource rents (Average: 0.05% of GDP).

Many of these countries have gone through continued political and governance turmoil, transferring large amounts of mineral wealth to undisclosed accounts. Sala-i-Martin and Subramanian (2013) assert that exchange rate policy appears to be determined by rent seeking behavior of the authorities, and fiscal expenditures and relative price movements were more or less the results of mineral resources boom (Sala-i-Martin & Subramanian, 2013).

Politics and natural resources: The poor performance of resource rich countries also can be attributed to two basic political features. First, rivalry to control the revenue tends to endanger extractive political states. Corrupt governments are more attracted to rent collection than wealth creation, since it satisfies their immediate economic and political gains at the expense of long term sustainable wealth creation that evades rent seeking behavior (Auty, 2001). Second, rent extraction is also used as a tool to solidify the ruling government’s power. This incurs political trade-offs that are essential to please other interest groups and gain their support. Even if governments in resource rich countries do have credible economic agenda, their political commitment accompanied with vulnerability of these economies to extraction and trade volatility will create disruption to the structure of the economy and quality of governance. This alone exposes these countries to sudden political changes associated with the trade-offs that the governments are obliged to meet, leading to weak governance and abiding political competition, which in turn leads to conflicts. Many of resource rich countries are among those with very poor governance indicators, including freedom of the press, rule of law, property rights and restriction to civil liberties.

Failing institutional quality: Resource rich countries with poor institutional capacity usually suffer from macroeconomic mismanagement and waste of resources. Many of resource rich countries do not have strong institutional capacity to manage its natural wealth effectively and provide efficient investment

incentives⁶. Lack of reliable policy and strong administrative structure make government institutions incapable of transforming resource wealth into economic development. This worsens public sector's inefficiency in managing the resource wealth, which in turn can lead to reckless and excessive spending. Such excessive expenditures, mainly spent on social services and infrastructure projects, create political pressures to maintain devoted recurrent expenditure (Bannon & Collier, 2003). In addition, the high concentration of capital expenditure in the early stage of resource extraction projects, and ensuing revenue inflows to the government provides opportunity for corruption (Stevens, 2003). Off budget accounts are typical tools that fuel such problems associated with resource wealth. Since such accounts are beyond the control of government auditors, they are more prone to corruption by elites. This affects the governing capacity of the administration and leads to social divisions and conflicts. Empirical studies have shown that rents from natural resources fuels civil conflicts by weakening the government's capacity and legitimacy or by financing rebels (Olsson & Fors, 2004).

6. However, one cannot help but recalling the words of L. Taylor and C. Rada (2006), "...this line of thought seems to boil down to Blame the Victim. If Washington Consensus policies don't deliver favorable outcomes in some developing or transition country, the blame doesn't rest with the policies themselves but with the country's own inadequate institutions..."

Policies Adopted or Recommended to Manage Natural Resource Revenue

The traditional policies to manage natural resources can be broadly grouped into four broad categories according to policy instruments, although it is typical that policies are interdependent and may contain elements from all categories, making the distinction among the three categories less clear-cut in reality. It is fair to say that most of policy recommendations focus on the macroeconomic effects, e.g., how to deal with commodity price volatility through fiscal, monetary, and exchange rate policies and not so much on structural/micro effects.

Fiscal policy and fiscal institutions to manage natural resource revenue: Many natural resource-producing countries have found it difficult to smooth government expenditure and decouple it from the short-term volatility of natural resource revenues using standard budget processes. Against this background, a number of natural resource-rich countries have established special fiscal institutions aimed at enhancing fiscal management. Special fiscal institutions include sovereign wealth funds (SWFs), fiscal rules, and fiscal responsibility legislation (FRL). A wide range of institutional mechanisms have been attempted in order to promote better fiscal management to tackle the impact of commodity prices volatility on resource rich countries. The majority of these institutions failed to address the problem, while some others even produced adverse impact.

Many resource rich countries have Commodity Funds or Sovereign Wealth Funds that are invested in the global portfolios for future welfare. The oldest and biggest commodity funds are in Kuwait and the United Arab Emirates, while in recent years, China created Sovereign Wealth Funds⁷. Creation of such commodity funds do not warranty that the authorities will be free of corruption (Davis et al., 2001). Two standard recommendations are that the funds are transparent and professionally managed, with clear rules and regulation that shows that politics should not interfere with their objective of maximizing the financial wellbeing of the economy⁸. Other recommendations stress that spending should go through the regular budget, so that they do not become any politicians' private "flush funds" (Humphreys & Sandhu, 2007).

Norway has a Special Petroleum Fund (SPF) that has clear and specific rules and procedures, with publicly known stabilization and savings objectives. The SPF is professionally managed and it is fully integrated in the budget process. The fund has exceptional record of transparency and accountability. Venezuela has a similar stabilization fund, but since its establishment, it faces serious difficulties in integrating in the budget process, and it is poorly managed and its rules and procedures have not been followed properly. Unlike Norway, its institutions are very weak and the government is not fully supportive of the fund. Azerbaijan has an extra-budgetary savings fund. This fund is managed professionally, and it is accountable to the president and fairly transparent. Kazakhstan has also petroleum National Fund, but it is excessively controlled by the president and has limited professionalism.

In a number of cases, rigid fund rules have been changed, bypassed, and suspended. In some extreme cases, funds were eliminated altogether (e.g. Chad and Ecuador) because of accumulation of arrears

7. See also Yves Jégourel, Sovereign stabilization funds and the end of the commodities? super-cycle: what are the challeng. September 17, 2015, <http://www.ocppc.ma/sites/default/files/OCPPC-PB-1523En.pdf> See also Marie-Claire Aoun, Les nouveaux défis des fonds souverains pétroliers , March 03, 2015 <http://www.ocppc.ma/publications/les-nouveaux-d%C3%A9fis-des-fonds-souverains-p%C3%A9troliers#.VjTntWuAH24>

8. The Norwegian Pension Fund is often cited as a good example.

and/or cash management problems in the context of increased spending pressures. In the case of Papua New Guinea's former Mineral Resource Stabilization Fund (MRSF), which was established in 1974, both relaxed operational rules and poor integration with budget and fiscal policy led to large fiscal deficits and public debt. Rules on deposits and withdrawals were changed over time in the face of budgetary pressures. Moreover, the assets were used as collateral for new borrowing and to repay debt. The MRSF subsequently closed in 2001.

The operational rules of SWFs need to allow them to function effectively within an appropriate overall framework for economic management. Clear and stable rules need to allow for flexibility in their operations. Flexibility would be harnessed when the SWF links its operational rules explicitly and transparently with a broader fiscal policy framework, as in financing funds. All these requirements point to the non-applicability of such funds to low-income countries. Moreover, these funds seem to skirt the most important question: what would the country look like when the resources run out and how the Funds can help getting to the desired goal?

While there may be some rationale for using the SWFS as a counter-cyclical tool to address short-term impact of a recession, for low income developing countries, the risks of misusing these funds for short term purposes are high. First, the source for output fluctuations in these countries frequently comes from external shocks and not internal demand so that the proceeds of these funds move in the same direction as output. Second, Gelb (1988) pointed out that measures to boost consumption tend to depress incentives for domestic producers (thereby worsening the Dutch disease effects) and creating unsustainable expenditures which would be difficult to stop once the short term effects are over. Third, and most importantly, the primary objective of using these resources is to replace the sources for economic growth (see below).

Fiscal rules: Since 2001, Chile follows a fiscal rule based on a medium term perspective instead of the current cash balance (OECD 2009). The rule targets a structural surplus at a specified level (such that certain public commitment such as pension fund can be kept). The surplus target is composed of a non-copper structural surplus and estimated long-term copper revenues which in turn, are based on a reference price. When actual copper prices are above the reference price, revenues are transferred to the copper fund and conversely. The reference price and the potential output used for the deficit rule are estimated by independent expert panels. Box 1 illustrates the usefulness of this approach.

Box 1: Fiscal rules

In June 2008, the former President of Chile, Michele Bachelet, and her Finance Minister, Andres Velasco, had the lowest approval ratings of any President of Finance Minister, respectively, since the return of democracy. There were undoubtedly multiple reasons for this, but one was popular resentment that the two had resisted intense pressure to spend the soaring receipts from copper exports. A year later, in the summer of 2009, the pair had the highest approval ratings of any President and Finance Minister. Why the change? Not an improvement in overall economic circumstances: in the meantime the global recession had hit. Copper prices had fallen suddenly. But the government had increased spending sharply, using the assets that it had acquired during the copper boom, and thereby moderating the downturn. Saving for a rainy season made the officials heroes. Chile has achieved what few commodity producing developing countries have achieved: a truly countercyclical fiscal policy. Some credit should go to previous governments, who initiated an innovative fiscal institution.

Excerpted from IMF, Chile 2005 Article IV Consultation

One of the main problems affecting resource rich economies is that the oil revenues tend to corrupt institutions and lower the long-term growth prospects. Based on this premise, the logical conclusion is to transform these countries into a “non-mineral” economy. One way to do this is to prevent government officials from appropriating the oil-resources directly. A number of policy measures have been suggested and tried to address this issue. Davis et al., (2003) and Sachs (2007) discussed the institutional arrangements and fiscal policy measures undertaken by resource rich economies to cope with commodity cycle.

Distribution of the resource revenues automatically and instantaneously directly to the citizens of the country has been suggested to reduce corruption and accelerate savings and investment (Sala-i-Martin & Subramanian, 2013). Although it might seem attractive, the option of per capita distribution of resource revenue hasn't been tried in developing countries. Certain proportion of resource revenue should be distributed among the citizens on a per capita basis, and this in turn help to decentralize decisions about the allocation of revenue between consumption and investment (Humphreys & Sandhu, 2007). Per capita revenue distribution can improve income distribution, strengthen resource allocation efficiency, limits corruption and improve managing resource revenue volatility. The increase in households' income leads to the increase in savings and investment which in turn spur long-run economic growth (Collier & Gunning, 1999).

The per capita distribution option may also improve public expenditure efficiency, as it creates a direct link between rent and public taxation that strengthens scrutiny of public expenditure compared with government expenditure of export taxation. Government tax can then follow the distribution. The tax revenue can be used for financing investment projects, reduce government debt, and/or transfer revenues to a fund. Citizens may not use their share of the resource revenue efficiently, but this scheme can help to minimize wasted resources on corruption and rent seeking. This is because tax revenues are less vulnerable to mismanagement and corruption than those coming from natural resources (Bräutigam 2008). Since citizenship is the basic eligibility criteria for receiving resource dividend, the scheme is very much open for leakage and fraud. The key issue here is perhaps how practical it is to implement such resource revenue dividend among the citizens and prevail over resistance from vested interest groups. Realistically, it is difficult to imagine how this method can be accepted by the political rulers of a poor developing country.

In resource rich countries, mineral wealth and its role in economic growth remain vulnerable to institutional and management weaknesses and unsustainable practices. In many of these countries, the policy and legal framework for natural resource management is unclear and incomplete. Management agencies are under-resourced, and the data needed for effective planning and decision making is absent. Shortcomings in governance and accountability have led to overexploitation of resources and environmental pollution.

Strong, transparent institutions play a key role in fostering competition and the development of markets. Legal, administrative, and institutional obstacles weigh heavily on the private sector and tend to encourage rent seeking rather than entrepreneurship, thereby hurting competitiveness and dampening growth. Poor employment growth in the resource rich countries can arise from inadequate output growth and/or from lack of pro-labor intensive investment. In these countries, the sectors that produce the most output employ very few workers while government expenditure and policies often favor capital intensive activities.

Institutions can fail in countries where politicians tend to ignore laws and spend the funds as they desire. When Chad received financial assistance from the World Bank, the agreement stipulated that the country

would spend 72 percent of the oil revenue on poverty reduction and put aside 10 percent in a “future generation’s fund.” In the event when the government wants to spend some money, it will be subject to oversight by an independent committee. But once the money began flowing the authorities reneged on the agreement. This indicates that international institutions may need to go beyond the Chad model to ensure future agreements are respected. Humphreys and Sandhu (2007) recommend to give extra powers to a global clearing house or foreign bank where the Natural Resource Fund is located, to allow actions such as freezing accounts in the event of a coup.

Exchange rate and monetary policies: During the commodity price boom, there will be an appreciation of the currency, and in such circumstances, floating exchange rate help to moderate the adverse impact of high volume of capital inflows and overheating of the economy. A number of developing countries followed an intermediate exchange rate policy, such as managed floating exchange rate or target zone policies. The midpoint of the zone can be taken as a basket of major currencies, rather than a simple bilateral policy against US dollar or euro.

Reserves accumulation by central banks is an option that allows resource rich countries to save during commodity boom and dis-save in bust. However, if the objective is smooth spending over time, rather than stabilizing the exchange rate, holding foreign exchange reserves has some drawbacks. In the first place, the reserves which are typically put in the form of treasury bills do not yield high returns. Secondly, higher reserves can trigger monetary expansion and hence inflation.

A poor country can also reduce net private capital inflows during booms: if foreign exchange reserves are accruing to high levels, there are alternative ways to cut the surplus in the balance of payments and facilitate national savings. One way is to pay down government debt, particularly short-term debt. Another option is to avoid any restriction on domestic citizens to investing abroad. A third option is to impose controls on capital inflows, especially short-term inflows. However, the issue remains whether it is the best course of action to be self-sustained, once the resources are exhausted.

Similar to developing a sovereign wealth fund, stabilization policy involves bringing only a certain share of the revenues into the country at once, saving some of the revenues abroad in special funds, and bringing them in slowly. Sterilization is expected to reduce the spending effect. By bringing the revenue into the country slowly, the country can gain a stable revenue stream, instead of an unknown revenue stream year after year. Allocation of natural resource revenue can be improved by establishing a resource fund to sterilize the rent system and match domestic expenditure to absorptive capacity, thereby evading the impact of Dutch disease on the growth of labor intensive non-mineral tradable sectors.

In general, resource revenue above a target resource commodity price is saved in the fund managed by the government’s assigned institution such as the Central Bank that sterilizes them in offshore investments until the domestic economy can absorb them efficiently. When commodity prices fall, the fund can be drawn down to ease adjustment by slowing public spending while addressing the potential impact of volatility in real exchange rate on competitive non-mineral sectors (Barnett & Ossowski, 2002). This can also help strengthen the transparency of resource revenue flows and thus reduce rent-seeking and corruption.

However, in developing countries it is usually difficult, at least politically, to save part of mineral revenues, as there is pressure to spend the mineral revenue right away to tackle poverty, while disregarding broader macroeconomic implications. One of Norway’s successes in managing its resource revenue is usually

associated with such a fund. On the other hand, in countries with weak institutional capacity and where transparency and accountability are not guaranteed, such funds will be susceptible to corruption and waste (Davis, 2001).

Despite its success in Norway, natural resource funds in general are not workable in countries with delicate institutional setup and rapacious rent-seeking interest groups. That is to say, sterilization policy is likely to fail in most cases. In a country such as South Sudan where in 2009 51 percent of citizens were impoverished, it is difficult to justify pooling a sum of revenue in a fund instead of using it immediately to help the people.

Policies to share risks: A number of countries, more advanced than the low-income countries discussed in this paper, create institutions focusing on absorbing the shocks and limiting adverse impacts from price volatility. For instance they set up price setting mechanism (through contractual agreement) between energy producers and foreign companies. Most often when the world price swings up, the government desires to break the agreement, preventing the company from taking all the profits. In such circumstances political pressure is inevitable. As this became a common practice, foreign companies were more reluctant to get involved. This affects the potential capital inflows to the country and possibly increases the price of the capital. Since this may lead to further renegotiation, there will be additional transaction costs incurred while exports are temporarily interrupted. Even if this has become frequent episode, particularly in developing countries, most of ongoing contracts still fail to address this problem.

Another way to share risks is through hedging in commodity futures market. Mineral producers commonly sell their commodities on international spot markets, and this makes them susceptible to price volatility risk. Generally, such risks can be hedged by selling the products on the future market. By hedging the risk, the producer does not need to renegotiate the contract in the event of high price swing in the international market. In that case, the adjustment takes place automatically. One major setback with this method is that in the event when the world price falls, the hedging party may get some credit, but will be unfairly rebuked when the world price goes up. Such treatment will be more severe if it is the government authority doing the hedging.

Hedging is a technique used to reduce risk. But in countries with abundant resources, implementing financial techniques comes with additional risks associated with corrupt government officials. By pooling money to purchase financial instruments, the risk of embezzlement and losses of productivity equally increase.

Indexing the mineral producing company or government's debt to the price of the commodity is another method suggested to share risks associated with prices volatility. This allows debt servicing to be automatically adjusted with the rise and fall of commodity price. Accordingly, this would insulate indebted developing countries from the kind of crises that occurred in Latin America in 1982 when prices for their exports plummeted because of US dollar interest rates. Developing countries experienced deteriorated debt service ratios and dire balance of payment. Indexing their debt to commodity prices would protect such adverse consequences. However, given that financial markets require certain level of liquidity, policy makers in developing countries are reluctant from undertaking this option believing that there would be no adequate demand from the market.

The permanent income approach: The survey on Dutch disease makes it very clear that resource rich developing countries should save instead of consume these non-renewable resources so that these they are depleted, the country can embark on a sustainable growth path (Van der Ploeg and Venables 2011). In a way, the period when natural resources are being exploited could be considered a transition during which these resources are gradually replaced by other types of renewable capital such as education and training, research and development etc. Since natural resources are exhaustible and belong to both present and future generations, it is only fair to spread the benefits from the natural resource wealth across generations. This also helps the government to smooth out expenditure volatility arising from fluctuations in resource revenues.

The permanent income approach is an attempt to even out the fluctuations in savings and aims at addressing three issues simultaneously: i) intergenerational equity between the current generation and future generation when resources are exhausted; ii) reduce the volatility in export receipts and in spending and through it, the impact on the real and financial markets (see above); and iii) reduce the adverse effects of the Dutch disease. In contrast, the first and third approaches only address the second issue while the second approach (exchange rate and monetary policies) deals only with the third issue. Specifically, Van Winbergen (2008) proposes to calculate the discounted value of the expected oil revenue stream and then calculate the level of real income equivalent to that discounted value. The policy rule is then to limit the real spending from oil to that fictitious real income level. However, it stopped short of recommending what to spend the money on.

With some exception in recent years (e.g., Collier, van der Ploeg, Spence, and Venables (2010)), the conventional view of the resource curse focuses more on volatility aspects, which are more relevant to advanced economies. For low income economies that are starting out in the development process, these theories neglected two important economic aspects: how to replace natural resources when they run out, and employment creation so that the economy's full potential can be achieved.

A Critique of the Adopted or Recommended Policies for Low-Income Countries

In a review of the Dutch disease discussed by the World Bank, Kojo (2014) noted that most reports offer a partial solution, focusing narrowly on fiscal measures, such as prudent fiscal management, counter-cyclical fiscal policies, or rule-based strategy to prevent real appreciation or avoid Dutch disease. Others recommend stand-alone policy actions, such as the accumulation of international reserves to avoid nominal appreciation of the local currency, or sterilization of balance of payments surpluses to mitigate upward pressures on the real exchange rate.

But even the “best practice” policy package, as discussed above, misses a number of fundamental issues for low income nations. First, what happens to the sources of growth when natural resources run out? Second, employment creation has not been considered as a societal objective. Without job creation, the learning-by-doing factor (Lucas 1988) needed for growth will have been lost. Third, the “one size fit all” approach has been adopted, with no distinction between rich and poor countries.

Specifically, the existing policy framework to manage natural resources for low income countries suffers from the following weaknesses:

Realism: While saving for the rainy day is a noble objective, it is not a realistic option if the country is confronted with pervasive poverty. Sending this money to where the highest return is also not a viable option. With the exception of a few countries, most low income countries are ruled by dictators or undemocratically elected leaders. It is their vested interest to hold on to these windfalls rather than directly distribute to the population or to send them abroad for the country’s future. The issue of governance and political institutions may lie at the root of the natural resource problem but is not likely to go away soon. But Collier et al. (2010) shows that the permanent income approach is theoretically incorrect.

“One Size Fits All “ approach: there is no distinction between high income countries where both stock of physical and human capital are high, institutions are efficient, and access to information is widespread, and the low income countries where physical and human capital are scarce, institutions are undeveloped, and information access is limited. In the context of low income countries, this approach results in unrealistic or impractical policy advice (e.g., sovereign wealth funds in an environment where poverty is prevalent).

But is it really different to have natural resources when you are poor than when you are rich? Did countries such as Australia and the United States not build their industry on natural resources? First, as pointed out by scholars such as G. Wright (1990), while it is true that countries such as Australia and the United States developed in concomitant with natural resources, they relied on the domestic development of technology and knowledge to exploit these resources. This is different from the current situation where poor countries have to import the technology and human resources for the entire sector. It is this technology and knowledge that lead the countries to develop, because they lead to the development of ancillary industries (such as technology of iron ore leads to steel development). The US experience suggests that economic growth can be complemented by technical progress in exploration, extraction and substitution and privatization of reserves. Many resource rich economies may have performed badly, not because they relied too much on resources, but because they failed in developing their mineral potential

through appropriate policies. Investment in minerals-related knowledge seems a legitimate component of a forward-looking development program. This opportunity is no longer available to the poor developing countries today.

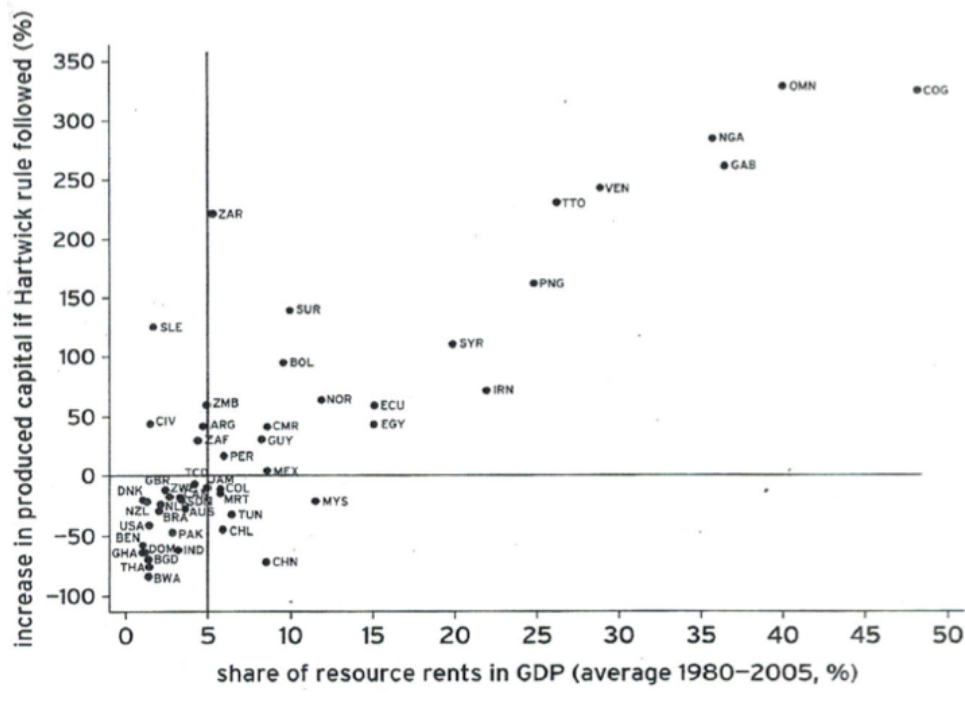
Second, countries such as Norway, the UK, or the Netherland that effectively absorbed the Dutch disease negative effects were actually already developed before natural resources were discovered so that they could marshal the entire economy, including the well-developed institutions to make full use of resources. Third, a few countries such as Chile, Indonesia, or Botswana that managed to escape the Dutch disease all have had an open regime and highly efficient public administration and an active public sector involvement. Fourth, the recommended policies take no account of the poor financial, human, and institutional resources prevailing in the low income countries. When most economic and financial decisions are made by a few civil servants, who are under the control of a few un-democratically elected rulers, it behooves the reality to think these resources can be managed according to any of the tools outlined above.

Overriding objective of natural resources use: Most of the recommended and/or adopted policies tend to ignore what the priority objective of these resources is. None of the policy recommendations places emphasis on the priority objective of using the proceeds from these resources to replace them when they run out. Since the lifetime of these resources is finite, it is imperative to think ahead of what happens when resources are exhausted. In many ways, a nation with natural resources is like a lucky person who won a lottery which pays a large sum of money for a few years. The real issue is how she manages her finances during these years so that she becomes well off at the end of that period when the winning proceed stops. Unlike an individual, a nation lives forever so this question becomes of paramount importance.

More importantly, the recommended or adopted policies do not follow the Hartwick rule, perhaps the most important advice on how to utilize proceeds from natural resources. Hartwick (1977) show that if these proceeds are invested in reproducible capital, per capita consumption will remain constant across generations hence achieving intergenerational equity as defined by Solow (1974).

As a consequence of this missing link, the resource abundant countries, particularly the low income ones, fall far behind other nations as far as “reproducible capital” is concerned. The World Bank estimated a “counterfactual” capital stock if these countries had invested these resources rent in reproducible capital since 1980 and compare this stock to the actual in 2005. The results are striking. Figure 5, taken from the World Bank, plots on the horizontal axis the countries in which rents account for more than 1% of GDP (average over 1980-2005) while the vertical shows the increase in produced capital if the Hartwick rule had been followed. Countries above the zero line are those that have under-invested. Sub Saharan countries fall above the line. Indeed the World Bank noted that all countries for which rents account for more than 15% (average 1980-2005) underinvested. It is worth noting that Norway, a country often used as an example of how to manage oil resources, and whose rents account for about 13% of GDP, also substantially underinvested under this rule.

Figure 5: Resource Abundance and Capital Accumulation: Where Has the Hartwick Rule Been Applied?

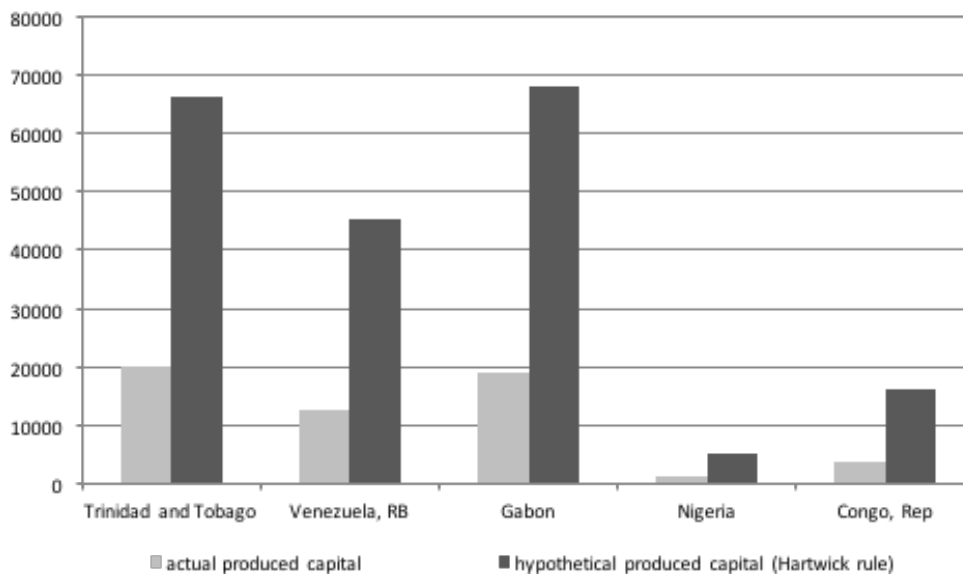


Source: World Bank (2011) The Changing Wealth of Nations

Note: Resource abundance is indicated by the share of resource rents in GDP. Capital accumulation shows the increase in produced capital a country could have achieved if it had reinvested all the rent. See World Bank (2006) for further explanation of the approach. Country names per ISO 3166-1 alpha-3.

Figure 6, again from the World Bank, shows the results of the Hartwick rule counterfactual for five resource-rich countries. In 2005, the Republic of Congo had accumulated \$3741 per capita in manufactured capital. If it had followed the Hartwick rule and reinvested all the resource rents from oil and gas, it would have accumulated more than five times as much manufactured capital: \$16,088 per capita. Similarly, if rents in the other four resource-rich countries shown in the figure had been reinvested, they would have reached a much higher level of per capita income.

Figure 6: Produced Capital Per Capita, Actual and Hypothetical, in Five Resource-Rich Countries, 2005



Source: World Bank (2011) The Changing Wealth of Nations .

Note: Actual capital is the amount the country accumulated in 2005. Hypothetical produced capital is the amount the country could have accumulated if it had followed the Hartwick rule and reinvested all resource rents since 1980.

Along the same line, Van der Ploeg and Venables (2011) argue that the permanent income hypothesis is not applicable to poor developing countries where capital is scarce. Instead, they advocate for investment in domestic capital except when absorption capacity is an issue in which case money from natural resources can be “parked” in foreign fund while waiting for the absorptive constraint to be relaxed. They also argue that the Dutch disease effects can be reduced if there exist unemployment in the economy so that the higher spending effect actually draw unemployed resources into the traded sectors.

In a comprehensive review of managing natural resources in developing countries, Collier, van der Ploeg, Spence, and Venables (2010) called for a modification of the permanent income hypothesis which, to them, not only unduly restrictive, but also is wrong on theoretical ground. While they recognize that consumption in natural resource abundant countries should be smoothed out, the key issue is how to use resource revenue for faster growth. And this, they stress, can be done through raising the marginal product of capital, both private and public. Public capital efficiency can be enhanced through improved procedures, while private capital can be improved with the provision of public investment.

Hamilton and Ley (2012) recommend the strengthening of the public investment management (PIM) system along the line suggested by Rajaram et al. (2010), i.e., to establish the “must-have” features for a well-functioning PIM system such as investment guidance and preliminary screening, formal project appraisal, independent review of appraisal, project selection and budgeting, project changes, service delivery and ex post project evaluation. Sachs (2007) also suggests that the Dutch disease effects can be reduced if the resource boom is used to finance investment so developing public infrastructure can offset the adverse effects of exchange rate appreciation.

While the Collier, van der Ploeg, Spence, and Venables (2010) article represents a break-through in terms of policy prescription for resource rich, low income countries, it stops short of giving them more concrete advice on what to do, other than calling for linking natural resource revenues to a clear vision of long-term development. In practice, to be useful as a guide for the developing countries, the modified permanent income approach as presented by Collier et al. needs to be accompanied by a developing strategy rather than a vague reference to investment in productive sectors. Indeed as shown in the next section and in the case of study of South Sudan presented in the annex, this paper deepens their analysis through the elaboration of a long term development strategy for these countries. Furthermore, their approach does not address a major issue facing these countries: the high level of unemployment or underemployment. As noted throughout this paper, a special characteristic of resource rich, poor developing country is that the sector that brings wealth itself employs very few people.

Job creation: Dudley Seers (1964) was one of the first economists who understood the connection between natural resources and job creation. He noted the peculiar characteristic of a (poor) petroleum exporting economy: high unemployment coexists with high wages. In such an economy, petroleum usually dominates both exports and government revenues. Moreover, petroleum companies are foreign owned, as technology is beyond the reach of local industries, while in the private sector, wages are the determining factor price. In such economies, Seers contended, factors that will influence employment are taxes on exports and the public sector surplus, the enterprise profitability, and the propensity to imports. Seers recommends to use this surplus to create import substitutions industries right from the beginning and not immediately open imports.

Seers’ observation remains valid today. Oil accounts for over 80 percent of South Sudan GDP and 99

percent of its exports. Yet less than 1.4 percent of the labor force is employed in the mining sector (Republic of Sudan 2011). Similarly, copper and copper related products account for more than 70 percent of Zambia exports, but less than 2 percent of the work force is employed in mining (Republic of Zambia 2013).

In Seers' model, foreign owned enterprises operating on natural resources can afford to pay high wages in part because wages are a small part of their total cost and in part because they are tax deductible expense. The perpetual impact comes from the fact that the increase in wages from the petroleum sector spreads out to other sectors and applies for existing workers rather than new workers hence a petroleum economy has minimum effects on new employment. Imports become cheap so this sustain the propensity to import. Urban migration means disguised unemployment becomes open. This increases the propensity to import further. Income inequality becomes worse and the pattern of consumption shifts in favor of the upper income classes so food imports intensify. In other countries, this would prompt policy makers to undertake drastic balance of payments measures such as import controls, tariffs etc., but because of the comfortable balance of payments position, these petroleum economies do not impose those.

There are a number of reasons why it is important to address the unemployment/underemployment aspects of resource rich, low income countries. First, from a political economy standpoint, policy makers can create a self-interest group with whom they can forge alliance. Second, as mentioned above, revenue from taxation rather than natural resources can be a source of stable revenue and less risky. The increase in jobs will help create a more stable and diversified source of income and hence tax receipts. Third, this approach involves raising consumption for current generation but through work rather than through direct government transfers. Finally, job creation fosters the "learning by doing" aspect of human capital development (Lucas 1988) when resources are exhausted.

Why the focus on job creation in addition to a growth oriented strategy? Doesn't a high growth economy generate jobs? Most economists in general agree that growth is a necessary, but not a sufficient condition for job creation. Economic development ultimately involves structural transformation, that is a reallocation of resources from less productive to more productive sectors and activities. Both the Growth Commission report and World Bank's World Development Report on Jobs (WDR 2013) stress the importance of diversification and structural transformation as an essential part of the process of catch up. A recent IMF report has stated:

"...The consensus among economists is that growth is an essential prerequisite (but not always sufficient) for job creation and social cohesion. In turn, jobs and increased labor force participation, including among women, are important to foster inclusive growth and reduce poverty and income inequality; and social cohesion and job creation can lead to more sustained growth..." (IMF 2014).

The impact of growth on job creation is particularly weak in developing countries, judging from the empirical evidence. Basnett and Sen (2013) reported insufficient evidence to draw conclusion on the impact of growth on employment in less developed countries (LDC) and found "...unequivocally that complementary policies are necessary to ensure economic growth has a positive impact on employment in LDCs."

While conventional economics recognizes the importance of work, it views work and leisure as complements. A person therefore only works to earn money and maximizes utility by minimizing work

and maximizing leisure. However, the reality is that a job is much more than a mean to earn income (World Development Report 2013). It can be associated with social status, self-respect, and dignity among individuals and families. From the perspective of the individual, having work is better than being given a handout whether from a government or a charity. However, this means that the income effect of the labor supply decision is positive rather than negative, as is often claimed, and the substitution effect may be zero. Marshall (1920) stated:

“...Perhaps after he [the worker] has been out of work for some time, he might, as far as his immediate comfort is concerned, rather work for nothing than not work at all.”

While virtually everyone agrees about the importance of job creation, there is little guidance by policy makers on how to go about creating jobs. World Development Report 2013 recognizes that job challenges are not the same everywhere (World Bank 2013). Creating more jobs may be a universal goal, but the types of jobs that can contribute the most to development depends on the country. Jobs that connect the economy to the world may matter the most in some situations; in others, the biggest payoff may come from jobs that reduce poverty or defuse conflict. Certainly, the level of development matters.

Managing Resources in Low Income Countries—A Framework for Growth and Prosperity⁹

In this section, we present an approach that takes into account the Hartwick rule and the unemployment aspect that Seers discussed. This approach is embedded in a proposed development strategy for resource-rich, low income countries and represents a departure from the traditional, neoclassical approach. It is consistent with the modified permanent income approach proposed by Collier et al. (2010)

As argued in the previous section, a new, more effective policy approach would need to focus on job creation. Job creation can resolve the tension between domestic pressures for consumption spending on the one hand and the country's long term growth objective on the other. It also resolves the political economy issue of leaders trying to commit spending before the next ones come along. Many leaders may feel that job creation is a way to consolidate their power and may even enthusiastically support it.

But how to create jobs and what kinds of jobs? In this respect, the new structural economics¹⁰ can offer a new perspective. For the new structural economics, countries at different stages of development have different economic structures due to distinct factor endowments. These endowment, which include land or natural resources, labor, capital (physical and human), hard and soft infrastructure, are fixed at any point in time but change over time as the economy develops. For countries at early stages of development, factor endowments typically reflect a scarcity of capital and an abundance of labor or natural resources. Accordingly, production activities tend to be labor- or resource-intensive — mostly involving subsistence agriculture, animal husbandry, fishing, and mining — and rely on conventional technologies to produce well-established products. Except for mining and plantations, such production has limited economies of scale. Firms are usually small and market transactions often informal, limited to local markets and familiar people. The hard and soft infrastructure required to facilitate such production and market transactions is limited and relatively simple. In developing countries with abundant unskilled labor and resources but scarce human and physical capital, only labor- and resource-intensive industries will have comparative advantages in open, competitive markets (Heckscher and Ohlin, 1991; Lin, 2003).

Economic diversification and acceleration of income growth are the main features of modern economic growth (Kuznets, 1966; Maddison, 2006) and hence employment creation. A low-income country with abundant labor or natural resources and scarce capital will have a comparative advantage and be competitive in labor- or resource-intensive industries. Similarly, a high-income country with abundant capital and scarce labor will have a comparative advantage and be competitive in capital-intensive industries. Thus a country's optimal industrial structure is endogenously determined by its endowment structure. For a developing country to reach the income levels of advanced countries, it must upgrade its industrial structure to the same relative capital intensity of advanced countries. But to do so, it must first close its endowment gap with advanced countries by exploiting its comparative advantages at each stage of development

Resource rich countries need to follow diversification strategies that are consistent with the country's latent (and evolving) comparative advantage. Chile, one of the Pacific Rim countries, successfully targeted industries that were consistent with its comparative advantage determined by its natural endowment, as

9. A fuller exposition of the arguments presented here can be found in Dinh and Lin (2014).

10. See Dinh and Lin (2014)

well as industries that were already mature in more advanced countries. While free-market reforms introduced in the early 1970s brought many benefits to the country, they were slowly accompanied by market failures (Diaz-Alejandro 1985). In recognition of these problems, the government has supported private sector growth through a number of policy instruments, including the provision of agricultural public goods by a state institution (Servicio Agrícola Granadero); guarantees for loans to small enterprises; a semi-public entrepreneurial institution (Fundacion Chile) responsible for the development of the salmon industry; the “simplify drawback” mechanism, which provided subsidies to new exports; the various programs of the national development agency (Corporacion de Fomento de la Produccion, CORFO); and the National Council on Innovation for Competitiveness.

Managing natural resources for a developing country should follow the development strategy of the country, which depends on the initial condition, the endowment structure, and the resulting comparative advantages in production. Resource rich low-income countries, except a very few small states, tend to have large unemployment or under-employment because the sector that generates growth and revenue is capital intensive, or because the requirement to work in this sector tends to be beyond the capability of the domestic labor force.

If the resource rich country has a small population, it could focus on growing the activities that are tradable. For instance, if the country is also blessed with beautiful scenery, developing the tourism sector should provide the long term foundation for growth when natural resources run out. Similarly, if the country is endowed with good geographical location, it could develop services such as air transport (this is what the UAE has done successfully). And if the country is endowed with skilled labor, it could develop into advanced, high technology industries or services.

For countries that are endowed with unskilled labor and are at the beginning of the industrialization process, the strategy is to focus on private sector jobs in labor intensive, simple light manufacturing. In an economy with a large surplus of unskilled labor, job creation will be maximized if the economy is first opened up for FDI induced assembly types (Cut-Make-Trim, or CMT such as in apparel operations). Later on, when the education system is improved, policies can focus more on how to raise the value added through encouragement of forward and backward linkages between the foreign invested enterprises and the domestic ones. It should be noted that in these economies, even though there are natural resources, the downstream industries associated with those resources tend to be very capital intensive and require high technology only available from abroad. Hence there are very few domestic, high-value added employment created in those sectors.

How do we know job creation will be maximized with assembly type of jobs? Sustained economic growth requires workers to move from lower productivity to higher productivity activities. This means workers should move from agriculture to industry or services sectors. For a developing country, what is relevant is how to create these high productivity activities. In the beginning stage, it is essential to create many jobs in medium productivity activities (high productivity activities would lead to a slower job creation, or in the limit, to loss of jobs). When an economy is able to draw in FDI from abroad, and expand employment of industry through drawing workers from agriculture, the presence of the marginal workers will lower the average productivity in industry, a point made by Roy (1951) recently confirmed by Young (2014). Timmer (2012) pointed out that the less productivity rises in industry (and services), the faster structural transformation can occur. In the limit, when productivity in industry and services is constant, the fastest path for structural transformation takes place. Assembly type of work is an activity where

productivity is constant. Moreover, as Taylor and Rada (2006) noted, for job creation to be sustained, productivity growth must be positive for per capita incomes to rise but demand growth must be stronger. Assembly type of jobs typically has global demand which would satisfy this condition. The next stage of the development process would then entail moving workers to higher value added jobs through skill improvement and training.

For firms to spontaneously enter industries and choose technologies consistent with their economy's comparative advantages, the price system must reflect the relative scarcity of factors in the country's endowment. This approach, based on following comparative advantages, may seem slow and frustrating in countries with major poverty challenges. But in reality, it is the fastest way to accumulate capital and upgrade the endowment structure—and the upgrading of industrial structure can be accelerated by the availability of technologies and industries already developed by more advanced countries. At each stage of their development, firms in developing countries can acquire the technologies and enter into industries appropriate for their endowment structures, rather than having to reinvent the wheel (Krugman, 1979; Gerschenkron, 1962). This possibility for using available technologies and entering existing industries is what has allowed some East Asian economies to sustain annual GDP growth rates of 8-10 percent.

The fact that wages remain high in a high unemployment country means that structural impediments in the labor market exist and need to be removed. Structural reforms in the labor market therefore need to be taken urgently. The failure of resource-based countries to industrialize can be seen in this context. For industrialization to take place, the availability of natural resources prevent the wage wedge between the “backward sector” (e.g. agriculture) and the modern sector (eg. manufacturing) from taking place. Such a wedge is necessary to bring the entrepreneur to invest in the modern, domestic sector with increasing returns to scale (Murphy, Shleifer, and R. Vishny 1989) thereby creating the big push needed for industrialization. Often the high wages are set by the minimum wage (either industrial or agricultural).

A number of countries have tried different ways to overcome this problem of high wages. In Mauritius, enterprises located in the industrial zones are exempted from the minimum wage laws. Some Latin American countries are trying to do the same thing by setting industrial parks in remote areas so to bypass the minimum wage laws. In other words, with a combination of appropriate policies such as clusters and flexible policy adjustment, the issue of high wages can be overcome, as the case of South Sudan below makes clear. Of course, moving towards a more flexible labor market would improve cost-competitiveness and create more jobs, but by itself would not assure that these jobs are decent, hence the need to have a clear development strategy which stresses moving productivity and wages along the structural transformation path to achieve higher income growth.

Similarly, neoclassical economics indicates that the exchange rate should reflect market conditions. But this, in the context of a resource rich, low income country means the exchange rate will be over-valued and consequently growth and job creation will suffer. Rodrik (2008) and McMillan and Rodrik (2011) suggest that undervalued exchange rates helps facilitate the structural transformation, especially if the tradable sector generates positive externalities such as learning and technology diffusion for the rest of the economy. One could argue that a conducive rate that reduces the effect of the Dutch disease is an exchange rate net of the resource effects, i.e., excluding the exports and imports related to natural resources. This rate would be similar to, but not equal to, the rate that would result from a complete sterilization policy, or one in which the net proceeds from resource extraction is fully invested abroad. This is because the latter consists of government revenue and not the complete export proceeds. In the

case of South Sudan discussed below, this is the “black” market rate.

One could also favor local producers by allowing them to import raw material and intermediate goods needed for production at an official rate while the rest of imports, along with exports of should go through the market exchange rate. This is consistent with temporary subsidy or tax relief for non-mineral tradable (export) sectors that are affected by deteriorating competitiveness arising from natural resources boom. This policy is particularly important for those industries are characterized by learning by doing and other knowledge transmission affects (Van Wijnbergen, 1986).

As a country climbs the industrial and technological ladder, many other changes occur. The technology used by its firms becomes more sophisticated and capital requirements increase, as do the scale of production and the size of markets. Market transactions increasingly take place at arm’s length. Thus a flexible, smooth industrial and technological upgrading requires simultaneous improvements in educational, financial, and legal institutions and in hard infrastructure so that firms in newly upgraded industries can produce sufficient amounts to achieve economies of scale and become the lowest-cost producers (Harrison and Rodríguez-Clare, 2010). Clearly, individual firms cannot internalize all these changes cost-effectively, and it is often impossible to achieve spontaneous coordination among many firms to meet these new challenges. Changes in infrastructure require collective action or at least coordination between providers of infrastructure services (which could be public, private or public-private partnerships) and industrial firms. For this reason it falls to government to introduce such changes or to coordinate them proactively. This brings us to our next point, which is the need to be selective in public spending.

Resolving the waiting time and absorptive capacity problems through step-wise and selective investment in infrastructure and education: Natural resource revenues can be used to finance useful investment projects such as infrastructure and education, or to reduce government debt. This will help to minimize wasting natural resource wealth with short term interest and objectives, but to make it last for future generation as well. The government can deploy the resource revenue to expand public investment in infrastructure, improve human capital and build strong social safety-nets.

As shown by Agenor (2010), investing in infrastructure can help economic development in a number of ways. But the development needs for a low-income country are vast, as illustrated in the South Sudan case study in the annex. If all resources from natural resources are devoted to infrastructure, or to education, or to improving public investment appraisal capacity, it would still take decades to achieve any progress. And even after achieving the goals, the question becomes “Then what?“. Will they be able to replace the existing natural resources with new resources?

Indeed, studies on economic development in Sub-Saharan Africa have usually invoked staggeringly long lists that suggest no feasible set of policy adjustments. Often, the implication has been that, unless all the shortcomings are fixed, the sector could not grow. Nowhere is this point shown more clearly than the attention of donors on Doing Business¹¹ indicators and the tendency to use these indicators to measure progress on industrialization.

Yet, developing economies in other regions have expanded production and exports of light manufactures without first resolving the sorts of constraints observed in Sub-Saharan Africa. China in the mid-1970s and early 1980s suffered from low product quality (sewing machines that leaked oil onto fabric, electric

11. World Bank published objective measures of business regulations in firms in 189 economies.

motors that failed in hot, humid weather), passive management (a manager at a large plant insisted that he did not know the unit cost of his product; another, asked to explain the presence of numerous idle workers, said, “If we don’t employ them, where would they go?”), administrative confusion (would-be investors that abandoned the Xiamen special economic zone after managers failed to provide set prices for land, electricity, and water), delays in moving merchandise through customs and port facilities, and indifference to customer needs (Dinh et al. 2013).

Most research on industrialization in Africa points to the lack of infrastructure as a key constraint on industrial growth. However, meeting Sub-Saharan Africa’s needs in infrastructure is a huge challenge and cannot be achieved in one or two decades. Part of the difficulty is that Africa’s infrastructure deficit is huge because of the years of neglect associated with poverty, but also because of the continent’s characteristics, including low population density, low rates of urbanization, the large number of landlocked countries, and the numerous small economies. The cost of satisfying Africa’s infrastructure needs is estimated by Foster and Briceño-Garmendia (2010) at \$93 billion a year (some 15 percent of Africa’s GDP), about two-thirds for investment, and one-third for maintenance. About half the capital investment is required for the production of power, which has been reported by enterprises in Sub-Saharan Africa as their most serious bottleneck, along with access to finance. Even under an optimistic scenario whereby efficiency gains are fully exploited through reforms, nonfragile and resource-rich low-income countries in Africa would only be able to meet the more modest targets in infrastructure needs in 20 years at existing rates of expenditure. If the efficiency gains are not fully exploited, it would take 30 years (Foster and Briceño-Garmendia 2010). Furthermore, because the binding constraints vary by sector and by firm size, economy-wide policies are not even effective in addressing the constraints.

In addition, as pointed out by Collier et al. (2010), low income countries can also run into absorptive capacity problems. For instance, one of the issues most low-income countries run into ramping up investment in infrastructure is the lack of skills in the construction industry. Bottlenecks in the infrastructure production could lead to increased marginal cost. For instance, a 10 percent increase in unit road construction costs resulted in a reduction of 0.7 percent in kilometers of paved roads per the World Bank Logistics Performance Index (Collier, Kirchberger, & Soderbom, 2013).

One way low income countries can resolve both the waiting time and the absorptive capacity problems is by a step-wise approach whereby all resources are investing into identifying and facilitating a specific sector to be used to spearhead the entire economy. In the same way, investment in human capital should be devoted to producing the right kind of workers to supply to the industry and not the advanced training system which produce graduates who cannot find the right jobs and have to migrate abroad. Thus one could envisage a situation where during the first ten years after resources are discovered and exploited, the focus of public investment in infrastructure is on building roads, port, electricity needed for a number of industrial parks needed to produce light manufacturing goods (both for domestic and exports needs). Public investment in education during this period should be focused on improving the enrollment and quality of primary education and low level vocational education. In the following 10 years, emphasis of public investment should be shifted to higher value added products while the education system should focus more on secondary and tertiary education. In this way, the investment program aims to create both demand and supply of workers.

Traditionally, public finance purists always call for transparency in the budget process and therefore the avoidance of special funds. But as discussed above, revenues from exhaustible natural resources

should be treated differently than, say, income taxes because they have a different function: to replace these resources when they run out. The proceeds from resource windfall should go into one single fund, to avoid multiple issues (Collier et al. 2010). Hamilton and Ley (2012) pointed out a natural resource fund (NRF) combined with an effective public investment management (PIM) system could address the main problems facing the natural resource rich countries: the Dutch disease, revenue volatility, political economy issues etc.

Fiscal policies dealing with the collection of government revenue from natural resources have been discussed (Hamilton and Ley 2012, Collier 2010). Hamilton and Kirk called for using the tax instruments in the right way to preserve the incentives and equity issues between the government and the foreign companies. Administrative cost and the capacity of tax administration are also important issues (Collier 2010).

But, as illustrated in the South Sudan case discusses in the Annex, the needs in a low income country are so vast that without setting priority, the fund will be wasted. Instead of using the proceeds of the fund the NRF on general infrastructure or education or urban development, the government should use these proceeds to: 1) provide all the necessary incentives to bring FDI into the tradable sectors (e.g., light manufacturing) into the country, focusing on exempt all inputs going into domestic production of simple light manufacturing goods, regardless they are destined for exports or for import substitution; 2) set up “plugs-and-play” industrial parks including building infrastructure such as electricity, roads, water supply together with all the financial assistance to help successful SMEs to expand; and 3) invest in training and education aiming to provide skilled workers for the light manufacturing sectors (see above). As the economy progresses, more efforts will be devoted by the government (and the associated public spending) to raise the value added content of the manufacturing goods.

As argued by Collier et al. (2010), both consumption and investment increases associated with natural resource windfall should rise gradually. This allows the absorptive capacity (i.e., bottlenecks in investment, especially in non-tradable sectors where imports cannot be used to relieve the supply constraints in the short run) to expand. Another reason is that the volatility in export receipts can be accommodated. In the worst case, cuts in investment can be made without affecting the entire economy. This can be done through a step-wise approach as explained above.

Our approach represents a more concrete step in the direction that Collier et al. (2010) suggested but includes the job creation aspect of development economics which has been neglected so far. Where does this approach fit in Collier et al.’s taxonomy? Table 2 reproduces Table 1 in their article in which they show government choices in spending \$1 of windfall revenue. This money could go to the private sector resulting in c dollar of consumption and $(1-c)$ of private investment, or it could go to the government to be spent on g consumption (such as government wage bill), or $1-g$ public investment (building roads), or it could go to lending to the private sector γ in which case it could result in private consumption fraction z and $\gamma (1 - z)$ of private investment and $(1 - \gamma) (1 - z)$ of foreign investment. Within this scheme our proposal would be a linear combination of the second and third row. The private consumption component does not come from government transfer, but rather from the job creation aspect of the approach.

Table 2: Government Choices for Spending US\$1 of Revenue and the First-Order

Effects								
		Consumption		Investment		Balance Sheet		
Optional action	Resource revenue	Private	Public	Private K stock	Public K stock	Foreign assets	Private assets	Public assets
Transfer/tax cut	1	c	0	$1 - c$	0	0	$1 - c$	0
Public spending	1	0	g	0	$1 - g$	0	0	$1 - g$
Domestic lending	1	z	0	$\gamma (1 - z)$	0	$(1 - \gamma) (1 - z)$	$-z$	1
Foreign assets	1	0	0	0	0	1	0	1

Source: Collier et al. 2010, table 1.

Note: c = share of consumption from tax cut; g = share of consumption in government spending; z = share of consumption in private response to government debt reduction/lending; g = share of private investment that domestic capital stock.

The proposed approach aims to help low income countries in general and those rich in natural resources in particular create a diversification development strategy. It does so by identifying concrete packages of specific, feasible, and inexpensive policy initiatives that can maximize a country's opportunity to jump-start its growth in production, employment, and exports of the tradable sectors. Focusing on specific industries highlights the constraints that exist and provides valuable information from which we may base targeted recommendations.

The proposed approach relies on identifying the possible opportunities in the tradable sectors and then identifying the binding constraints in each sector before using the proceeds from the NRF and other government policies to alleviate these constraints. Setting such a priority has made the exercise more manageable, the policy actions more precise, and the sequencing more appropriate. The approach builds on the work of Hausmann, Rodrik, and Velasco (2005), who visualize development as a continuous process of specifying the binding constraints that limit growth, formulating and implementing policies to relax the constraints, securing modest improvements in performance, and then renewing growth by identifying and pushing against the factors limiting expansion in the new environment. It is also consistent with the new structural economics approach, which views economic development as a process that requires the continuous introduction of new and better technologies in existing industries and the upgrading of labor- and resource-intensive industries to new, more capital-intensive industries.

Following Hausmann, Rodrik, and Velasco (2005), our approach emphasizes that development begins somewhere, but not everywhere. In Africa, as in China, applying limited funding and administrative personnel to implement a set of sharply focused reforms holds the promise of initiating new clusters of production, employment, and, eventually, exports without first resolving economy-wide problems of land acquisition, utility services, skill shortages, administrative shortcomings, and the like.

Identifying Opportunities in Tradable Sectors: How can a country or a region determine whether its products reflect its comparative advantages? If a country's products are being successfully exported to global markets or are beating out imports in domestic markets with no government help, the country is sure to have a comparative advantage in those products. Similarly, if, without the recipient government's heavy subsidies, an industry producing exports is attracting a growing amount of foreign direct investment (FDI), the country has a comparative advantage in those goods, too. Foreign direct investors have a keen

sense of what countries can produce to compete internationally.

For existing products, the concept of revealed comparative advantage (RCA) following Bela Balassa (1965) can be used to pinpoint industries in which increased production could accelerate industrialization. This is a traditional method based on a country's trade data as reported in mirror in UN COMTRADE data base. Another method, domestic resource cost, can also be used, but would require further detailed field.

The RCA based on trade data can be determined either quantitatively using the Balassa index, or qualitatively by inspection of detailed import data. The Balassa index is an index that shows the relative advantage or disadvantage of a country in exporting a commodity as revealed in its actual export patterns relative to those of all other countries in the world. It is defined as follows:

$RCA = (E_{ij} / E_{iw}) / (E_{wj} / E_{wn})$, where E_{ij} refers to exports of commodity j by country i ; w is the set of countries; and n is the set of all commodities. A country has an RCA in commodity j if the RCA is greater than 1 and a comparative disadvantage in commodity j if the RCA is less than 1.

Another method which also relies on trade data is a careful review of a country's imports to identify sectors that require only small investments and have limited economies of scale and could thus benefit from domestic manufacturing. In this case, imports are used as a proxy for domestic demand, and therefore the issue is whether domestic supply is capable of producing such competitive products.

For new products, the concept of latent comparative advantage, as introduced in Lin (2009), can be used to identify new industries that are likely to be consistent with a country's comparative advantages. The most precise way of applying latent comparative advantage is found in Lin and Monga (2011): the Growth Identification and Facilitation Framework. Drawing on the experiences of successful and failed industrial policies and applying the theories of comparative advantage and the benefit of backwardness, the Lin-Monga framework proposes a six-step process for identifying industries in which developing countries may have latent comparative advantages and for creating the conditions and removing the constraints that impede the emergence of these industries.

Identifying the binding constraints: Based on a variety of information sources including private survey (e.g., EGAT Entrepreneur Survey¹²), the World Bank Enterprise Survey, and the World Bank Doing Business Survey, the most binding constraints the firm level can be identified. The EGAT Entrepreneur Survey is a modified version of a highly tested product which has been successfully conducted in China, Ethiopia, Tanzania, Vietnam, and Zambia (Fafchamps and Quinn 2012). The Survey covers selected areas within the investment climate, productivity, and logistics. In contrast to the World Bank Enterprise Survey, which is concentrated on major cities, the Entrepreneur Survey data are focused on specific areas of focus, such as the South Sudan–Sudan border.

Just like our findings in other African countries, in South Sudan our survey shows there are six main constraints across sectors and firms that impede the competitiveness of light manufacturing: the availability, cost, and quality of inputs; access to industrial land; access to finance; entrepreneurial capabilities, both technical and managerial worker skills; and trade logistics. Among small firms, the most important constraints are in entrepreneurial skills, land, inputs, and finance. Among large firms, the most important constraints are associated with trade logistics, land, and inputs.

12. See Economic Growth and Transformation (EGAT) report (2015). <http://concordis.international/wp-content/uploads/2012/11/4237-EGAT-Final-Report-WEB.pdf>

The Case of Low Income Nations with Future Natural Resource Windfalls: Before concluding, it may be worthwhile to discuss these countries. In the coming years, a number of African nations including Ghana, Kenya, Mozambique, Tanzania, and Uganda, are expecting resource windfalls from fuel discoveries. A number of national and regional policies to address the resource curse have been discussed. These policies may be theoretically relevant and thoughtfully constructed, but the pragmatic implementation on low income African nations has yet to be demonstrated.

The situation of future windfall is unique in that an additional number of unknowns are introduced (Newman, Page, Rand, Shimeles, Söderbom, and Tarp, forthcoming 2016). These include the timing and gross amount of the resource windfall. Recent experience has shown that estimates are incorrectly skewed to an earlier, larger revenue stream. This is a dangerous error as borrowing and infrastructure may exceed the revenue gained by the windfall. For example, Uganda possesses a large amount of oil that has yet to be extracted. But, analysis from Henstridge and Page (2012) shows that, even with production beginning in 2015, it will take over a decade until revenue reaches near 5 percent of GDP. Meanwhile, the macroeconomic risks of the boom are great: slow diversification, impaired structural change, uncontrolled overspending, and building external debt (Henstridge & Page, 2012). These issues are all interdependent on the timing and sizing of the boom, and a mismanaged prediction of the boom can exacerbate all risks.

For these countries, it would seem the case for a new approach as proposed in this paper is a fortiori needed. The effects of the Dutch disease can be allayed if early actions can be taken. A portion of the revenue can be used to support infrastructure and human capital. Investments in this area can promote diversification, one of the areas adversely affected by the Dutch disease. It is important to consider, however, that infrastructure projects must be carefully analyzed before implementation. Infrastructure related to trade will serve the dual purpose of supporting exports of the natural resource and diversification.

Investing in skills can also promote other sectors. Lack of human capital and skills in Uganda is being shown to be a constraint on performance in firms. The World Bank reports 47 percent of companies report a moderate, major, or very severe constraint to business (World Bank 2007). Lack of skills in the area of production limits the quality and quantity of exports and reduces competitiveness in these sectors. This may not be the case in all nations with resource windfalls. Careful consideration on diversifying sectors through education and improving skills must be considered. Here, debt management becomes particularly important. The initial investment of infrastructure and skills is large, thus the uncertainty in future windfall revenue can drive the country to a debt overhang situation which was discussed earlier in this paper. The main issue is that excessive debt impairs future ability to borrow. The opportunity of natural resource revenue to drive growth is a high risk, high reward situation and calls for a careful, well-thought out development strategy.

Conclusion

The literature on resource dependency in the last three decades is long on theoretical and empirical effects of natural resources on an economy, but short on practical policy prescriptions to deal with these effects. The recommended policies normally range from adjusting fiscal policy to deal with commodity volatility, adapting monetary policy to reduce the external shocks, and keeping the real exchange rate competitive. This paper makes the argument that these policies are targeted toward the symptoms of natural resource dependency, and not the underlying cause of concern about this dependency, which is, how to replace these resources when they are gone. This point is all the more important considering that the poorest, resource dependent countries have negative genuine savings rate (World Bank 2006), i.e., they are living off their natural resource assets. Traditional policies also miss another important feature of resource rich countries: the need to create jobs because the sector that generates wealth does not employ many workers.

The conventional approach of leaving everything to market forces could lead a country to a vicious circle where the resource curse drags down economic growth leading to further dependency on natural resources. This paper recommends poor countries endowed with natural resources to focus on structural and microeconomic policies aimed at boosting the competitiveness of the tradable sectors, including manufacturing and services. These policies are expected to complement the building up of human resources over time and would have a long lasting impact on economic development. More specifically, the approach calls for a diversification strategy focusing on job creation leading to a “learning by doing environment” that would foster potential industries and services that could replace natural resources when they are exhausted.

Using the specific example of South Sudan, the paper examines the conditions in poor developing countries such as political instability, limited financial and physical infrastructure, low human resources, and failing institutions. It discusses how these conditions limit policy options. The policy problem for these countries is particularly serious because in addition to the usual problem of dealing with growth and development issues typical of all developing countries, they have to deal with compounded issues caused by natural resource dependence. Because the resources available from natural resources are dwarfed by competing development needs, priorities have to be determined and trade-offs made. As expected, the additional list of problems arising from natural resources is overwhelming, far beyond the capacity of any omnipotent government, let alone that of the least developed countries.

South Sudan Case Study¹³

Overview

The case of South Sudan can typically illustrate the policy issues discussed above. South Sudan was established in 2011, following a long conflict with Sudan lasting over three decades. With a population of 11.3 million people and a per capita income of \$950 in 2013 (World Bank 2015), South Sudan is classified as a lower-middle-income country. However, this income level was artificially inflated by oil income: South Sudan poverty remains high, and its institutions are nascent. Over 80 percent of gross domestic product (GDP) and over 99 percent of exports come from oil. The country is landlocked in the midst of six other countries, including two fragile states (Democratic Republic of Congo and Central African Republic). Thus, transport costs are high and can only be reduced in the medium and long term. A ton of beans, for example, costs 60 percent more in Juba than in Kampala; transport and logistics contribute 40 percent of the difference (World Bank 2014b).

Social Indicators

Compared with social indicators in Sub-Saharan Africa, social indicators in South Sudan are much worse (Table A1), despite an abundance of natural resources. For example, the mortality rate among children under 5 is almost 100 deaths per 1,000 live births compared with 92 deaths, on average, in the region. Life expectancy at birth is a mere 55 years; the primary school completion rate is 37 percent; and 45 percent of the urban population and over 70 percent of the rural population have no education (World Bank 2014a).

Table A1: South Sudan Social Indicators Compared with Sub-Saharan Africa, 2013

	South Sudan	Sub-Saharan Africa
GNI per capita, Atlas method (current US\$)	950.0	1686.0
Life expectancy at birth, total (years)	55.2	57
Fertility rate, total (births per woman)	4.9	5
Adolescent fertility rate (births per 1,000 women ages 15-19)	72.0	106
Contraceptive prevalence (% of women ages 15-49)	..	24
Births attended by skilled health staff (% of total)	..	49
Mortality rate, under-5 (per 1,000 live births)	99.2	92
Malnutrition prevalence, weight for age (% of children under 5)	..	21
Immunization, measles (% of children ages 12-23 months)	30.0	74
Primary completion rate, total (% of relevant age group)	37	70
School enrollment, primary (% gross)	..	100.4
School enrollment, secondary (% gross)	..	41
Ratio of girls to boys in primary and secondary education (%)	..	90
Prevalence of HIV, total (% of population ages 15-49)	2.2	4.5
Forest area (sq. km)	..	5874.1
Terrestrial and marine protected areas (% of total territorial area)	..	16.3
Annual freshwater withdrawals, total (% of internal resources)	2.5	3

13. For a more elaborate analysis of South Sudan and Sudan, see Economic Growth and Transformation (EGAT) report (2015). <http://concordis.international/wp-content/uploads/2012/11/4237-EGAT-Final-Report-WEB.pdf>

Improved water source (% of population with access)	..	64
Improved sanitation facilities (% of population with access)	..	30
Urban population growth (annual %)	5.2	4.1

Source: World Development Indicators 2015

Table A2 shows recent economic developments in South Sudan. Economic growth has been volatile; GDP annual growth rate swung from -26 percent to 31 percent in one year due to disruptions in the oil sector caused by conflicts. For the two years 2011/12 and 2012/13, oil production dropped sharply before recovering at the end of 2013 to about 235,000 barrels a day. Oil production dropped again to about 160,000 barrels a day in early 2014. Non-oil economic activity is estimated to have declined in the last two years because of conflict. Inflation has accelerated recently to over 25 percent part because of a large fiscal deficit (over 10 percent of GDP), while the current account has turned negative due to the drop in oil production.

Table A2 South Sudan: Macroeconomic Indicators

	Percentage				% of GDP
	2011/12*	2012/13*	2013/14*	2014/15*	2014/15*
GDP (annual growth at constant prices)	-25.1	-26.7	30.7	-7.5	100.0
Oil	-49.3	-74.6	259.6	-12.2	92.0
Non-oil Industry	4.6	1.7	-3.2	-4.9	8.0
Inflation (end of period)	74.1	-11.1	.6	25.5	N/A
Fiscal Deficit (% of GDP)	3.7	-15.4	-3.0	-10.7	-10.7
Current Account Balance (% of GDP)	9.5	-18.0	7.7	-4.9	-4.9

Source: IMF Staff Report for the 2014 Article IV Consultation on Republic of South Sudan, December 2, 2014 and United Nations 2013.

Note*: Fiscal year ends in June.

Oil and Gas Sector

According to the U.S. Energy Information Administration (EIA), most of Sudan and South Sudan's proven reserves of oil and natural gas are located in the Muglad and Melut Basins, which extend into both countries. Natural gas associated with oil production is flared or reinjected into wells to improve oil output. Neither country currently produces nor consumes dry natural gas. Estimates from the Oil & Gas Journal place proven oil reserves in South Sudan at 3.5 billion barrels as of January 1, 2014. At the country's pre-shut-in 2011 average production level of 340,000 bbl/d, South Sudan will run out of oil in 28 years. Because of civil conflict, oil exploration prior to the 2011 independence was mostly limited to the central and south-central regions of unified Sudan. Oil and natural gas exploration in Sudan and South Sudan remains limited because of the lack of evidence of reserves. National oil companies from Asia dominate the oil sectors of Sudan and South Sudan. The China National Petroleum Corporation, India's Oil and Natural Gas Corporation, and Malaysia's Petronas hold large stakes in the leading consortia operating oil fields and pipelines. National oil companies Sudapet (Sudan) and Nilepet (South Sudan) hold small stakes in operations.

South Sudan has experienced frequent disruptions in production over the past few years. In January 2012, the country voluntarily halted its production in a dispute over transit fees with Sudan. Production was partially shut down at the end of 2013 because of civil conflict. During the first half of 2014, South Sudan's

production averaged 150,000 barrels per day. Disagreements over oil revenue sharing and armed conflict have curtailed oil production in both countries over the past few years. The oil fields in both countries are mature, and output has naturally declined. The EIA assumes that, even if there are no production outages in South Sudan, the country's production cannot recover to its pre-shut-in 2011 average level of 340,000 bbl/d at least in the near term because of permanent damage and natural decline, particularly at mature fields in Unity State.

The Oil Effects

Like other low-income countries that are oil rich, South Sudan must cope with problems that arise from managing oil resources discussed in earlier sections. These problems include the long-term decline in terms of trade for commodities vis-à-vis manufactured goods; the dependence on oil rents, which creates revenue volatility because of unstable world oil prices; the enclave nature of the oil industry, which has few links with the rest of the economy and provides little direct benefit to local communities; the adverse macroeconomic effects of foreign-exchange inflows (“Dutch disease effect”) on competitiveness, balance-of-payments, and debt and the eventual crowding out investment effects in sectors with higher value added and skill requirements; the ever-increasing role of the state, which can produce further problems associated with government failure, bad decision making, corruption, rent seeking, protectionist policies, inefficiency and distortions; and the sociocultural and political impacts associated with the nature of regimes found in resource-rich countries (for example, rentier states, developmental versus predatory regimes). These problems are compounded by South Sudan's struggles as a new nation, such as weak or nonexistent institutional capacity and a lack of qualified bureaucrats. These problems are overwhelming, far beyond the capacity of any omnipotent government. More importantly, oil production is expected to decline beginning in 2016, and, at full capacity production, 90 percent of reserves will be exhausted in about 28 years.

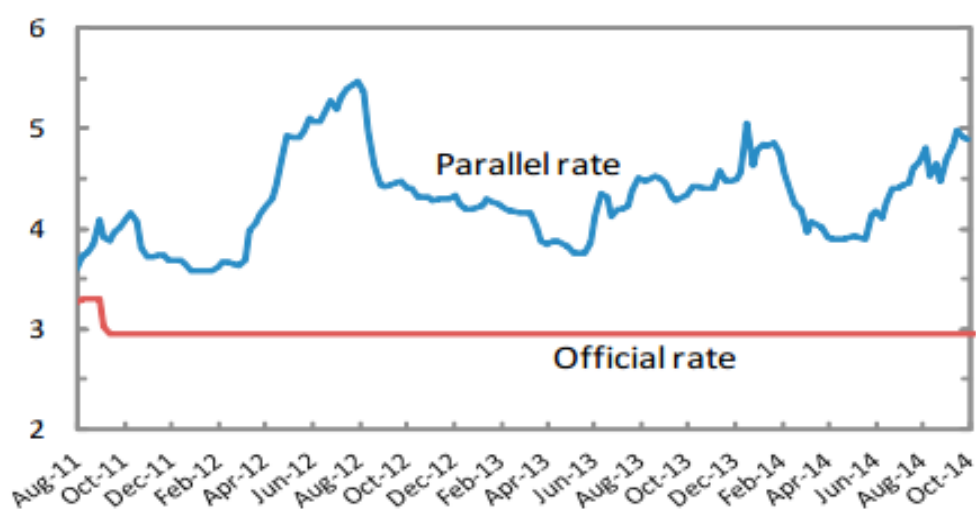
The most important effects in the context of the present analysis are the overvalued exchange rate and high wages, which tend to discourage labor-intensive, tradable sectors.

Exchange Rate Overvaluation

In the decade prior to 2011, the real exchange rate of the formerly unified Sudan was overvalued by about 60 percent as a result of the spending effect noted above. The new currency, the South Sudanese Pound (SSP), inherited this overvaluation when it was pegged at the same rate to the U.S. dollar in 2011 (2.9). In addition, in September 2011, the Bank of South Sudan decided to peg the currency at an overvalued level and ration foreign exchange. Consequently, a dual exchange rate system emerged whereby an official rate was artificially maintained, while a market rate generated rent and led to the formation of rent-seeking groups. Between 2011 and 2013, the real exchange rate based on the official exchange rate is estimated to have appreciated a further 50 percent. In the meantime, the government was forced to ration the supply of foreign exchange at the official rate in a bid to maintain adequate foreign exchange reserves. This led to the emergence of a gap between the official rate and the market rate, the latter fluctuating mostly between 4 and 5 SSP/USD (Figure A1). The nominal devaluation of the market rate meant that the real exchange rate based on the market rate remained broadly stable.

Figure A1: South Sudan: Official and Parallel Market Exchange Rates

(South Sudanese pounds per U.S. dollar)



Sources: South Sudanese authorities and IMF staff estimates and projections.

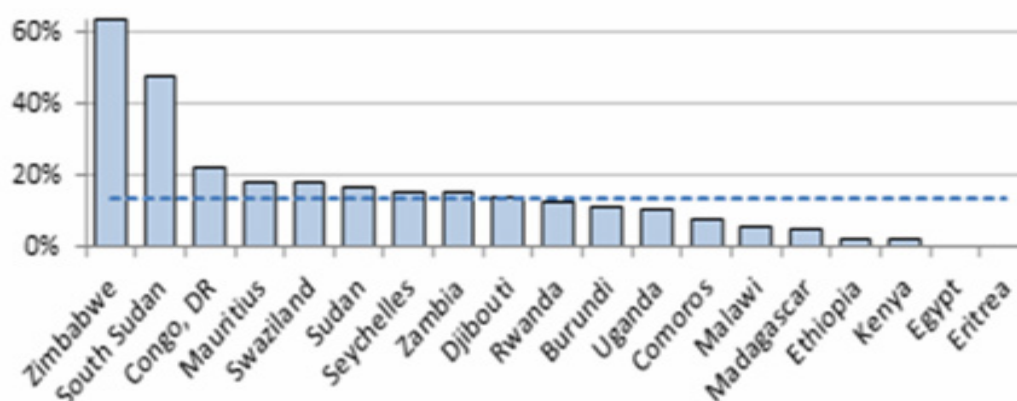
The dual exchange rate system creates uncertainty. A large majority of private sector transactions are currently carried out at the market exchange rate, which provides a better incentive for domestic producers. However, some importers have access to the official rate, which creates a high level of uncertainty among local producers wanting to invest and hire in South Sudan. Also, the dual system signals the intentions of the government to return the market rate back to the official rate, which may prevent domestic firms from hiring and investing based on the competitiveness level provided by the market exchange rate. A policy of reestablishing a single, sustainable market rate at a level that offsets previous real appreciation should be a priority for the government.

Another important policy step will be to adopt an exchange rate regime that can contribute to the competitiveness of South Sudan's non-oil sector. The current pegged system, contained in the Central Bank Law, does not ensure that exchange rate levels are compatible with the competitiveness of key non-oil sectors. In particular, adjustments in the level of the exchange rate in a pegged system can only be made through large and sudden devaluations, which, because of adverse political consequences, are not favored by policy makers.

Level of Wages

Critical to the competitiveness of a nation is the level of wages. It is often reported that the average wages in South Sudan are higher than neighboring countries and those in Sub-Saharan Africa. For example, the World Bank (2014a) notes that, for professional services such as engineers or accountants, South Sudan's average wages are almost 80 percent above the Common Market for Eastern and Southern Africa (COMESA) average. This is driven in large part by a lack of labor skills, which has led firms to employ a higher proportion of expatriates. Figure A2 shows the average monthly salary in selected COMESA countries. South Sudan is ranked second after Zimbabwe.

Figure A2: Average Gross Monthly Salary of Professionals (USD) in Selected COMESA Countries



Source: World Bank 2014a.

Higher nominal wages relative to neighboring countries are also found among unskilled workers in rural areas. The same World Bank report notes that, in 2011, rural labor costs in South Sudan were three to seven times higher than in Uganda and Tanzania (Table A3). The higher cost of rural labor is typically explained by the high costs of food, fuel, and transport (which necessitate higher nominal wages) and an exchange rate valuation that is solely determined by South Sudan's oil export sector.

Table A3 Average Rural Wage Labor Costs, South Sudan and Other Countries

Countries	Labor cost (US\$/man-day)
South Sudan	7.50
Uganda	1.0
Tanzania	2.31

Source: World Bank 2014a.

However, our survey (EGAT) in 2015 shows that, if the market exchange rate is used, wages in South Sudan could be competitive with those in other countries. Even taken at a midpoint between the official rate of SSP 2.95 and the market rate of SSP 9 per U.S. dollar, table A4 shows that South Sudanese wages for skilled and unskilled workers are competitive with those in five other countries, especially considering that the data are from 2010 and, most likely, would show higher wages in 2015.

Table A4 Monthly Wages in the Light Manufacturing Sectors of Six Countries, Various Years

Product	Labor Type	China (\$) ²⁰¹⁰	Vietnam (\$) ²⁰¹⁰	Ethiopia (\$) ²⁰¹⁰	Tanzania (\$) ²⁰¹⁰	Zambia (\$) ²⁰¹⁰	S. Sudan (\$) ^{2015*}
Polo shirts	Skilled	311–370	119–181	37–185	107–213	na	
Dairy milk	Skilled	177–206	na	30–63	150–300	106–340	34-425
Wood chairs	Skilled	383–442	181–259	81–119	150–200	200–265	85-255
Crown cork	Skilled	265–369	168–233	181–na	na	na–510	34-340
Leather loafers	Skilled	296–562	119–140	41–96	160–200	na	
Milled wheat	Skilled	398–442	181–363	89–141	200–250	320–340	34-425
Average	Skilled	305–399	154–235	77–131	153–233	284–364	171-212
Polo shirts	Unskilled	237–296	78–130	26–48	93–173	na	

Dairy milk	Unskilled	118–133	31–78	13–41	50–80	54–181	10-306
Wood chairs	Unskilled	206–251	85–135	37–52	75–125	100–160	17-255
Crown cork	Unskilled	192–265	117–142	89–na	na	na–342	3-102
Leather loafers	Unskilled	237–488	78–93	16–33	80–140	na	
Milled wheat	Unskilled	192–236	78–207	26–52	100–133	131–149	10-306
Average	Unskilled	197–278	78–131	35–53	80–130	157–208	91-110

Source: Dinh et al. (2012) and EGAT Report 2015.

na = not available. * The 2015 exchange rate used was SSP 5.9 per US\$. The value for South Sudan dairy milk and milled wheat is the average of agribusiness.

A more detailed account of South Sudanese wages among skilled and unskilled workers is given in table A5. It is clear that, at the black market rate of SSP 9.5 per U.S. dollar, South Sudan can be competitive. Indeed, at that exchange rate, the average monthly skilled wages in South Sudan range from \$106 to \$132, while unskilled wages range from \$57 to \$68, the lowest wage range of the six countries (even without consideration of the five-year lag). The development of labor-intensive sectors in South Sudan depends to a large extent on whether a market-based exchange rate can be established. This problem is not unique to South Sudan. In all resource-dependent countries, the exchange rate, even if it is determined by true demand and supply, cannot reflect the real scarcity of nonrenewable resources.

Table A5 Wages (US\$/month) by Sector at Different Exchange Rates

Agribusiness	Edu lev	Wages in SSP		Exch=2.9		Exch=5.9		Exch=9.5	
Average	3.9	653	1193	221	404	111	203	69	126
Largest		1800	2500	610	847	306	425	189	263
Smallest		60	200	20	68	10	34	6	21
Wood		0	0	0	0			0	0
Average	1.8	690	1000	234	339	117	170	73	105
Largest		1500	1500	508	508	255	255	158	158
Smallest		100	500	34	169	17	85	11	53
Metal		0	0	0	0			0	0
Average	4.8	389	1140	132	386	66	194	41	120
Largest		600	2000	203	678	102	340	63	211
Smallest		20	200	7	68	3	34	2	21

Source: EGAT Report (2015)

Notation: 1. No education, 2. Incomplete primary education "Primary Four." 3. Completed primary education, 4. Incomplete secondary education, 5. Completed secondary education, 6. Vocational / technical school certificate, 8. College / university degree (BA, BSc, etc.) from a university in another country.

This low level of wages is confirmed by a World Bank report showing that about 50 percent of the working population in Juba earns less than SSP 600 per month (\$102 at the SSP 5.9/U.S. dollar exchange rate). Only 5 percent earn more than SSP 3,000. Women earn significantly less than men. Foreign laborers earn, on average, as much as South Sudanese laborers. In Juba, nationals earn SSP 934 a month, while foreigners earn SSP 853 a month.

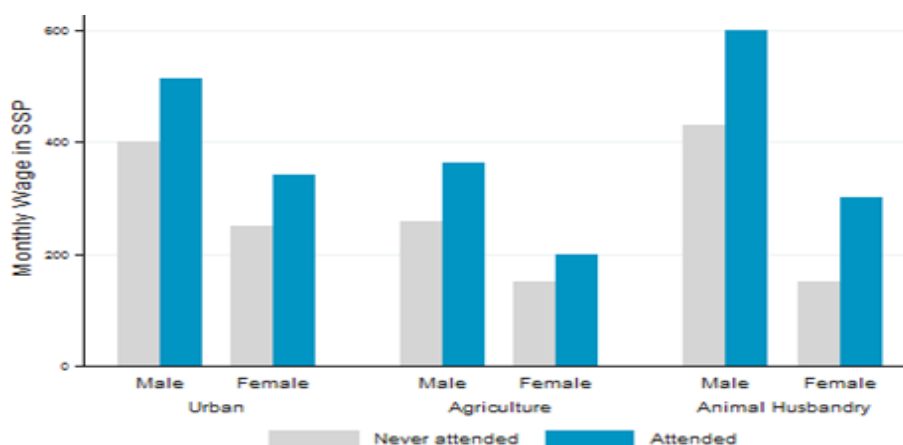
Factors Affecting Job Creation

In addition to wages, three additional factors may affect South Sudan's ability to create jobs. First, the labor force generally lacks skills and sufficient levels of education. Second, the youth population holds an unreasonable expectation of high-paying government jobs in coming years. Third, the Labor Law and labor regulations currently in effect were designed in an earlier era when job creation was much less critical.

Education and Skill Level

South Sudan's education indicators are low even by the standards of other Sub-Saharan African countries (Table A2). A lack of marketable skills and experience makes it more likely that a person is unemployed. In 2009, about 71 percent of the population in rural areas and 45 percent in urban areas had no education. In Juba, 25 percent of the population without a primary education is unemployed. Primary education decreases the risk of unemployment to 13 percent. Secondary education can be found almost exclusively in urban areas and is mostly obtained by men. Secondary education increases the chances of labor force participation, from about 71 percent to 90 percent. Postsecondary education decreases the share of discouraged workers, but also slightly increases the unemployment rate, to 23 percent. Higher education does not necessarily raise employment in Juba, but other factors also influence employability (see below).

Figure A3: Schools and Average Monthly Wages



Source: World Bank 2014a.

Literacy generally leads to higher wages. Primary education is associated with increased wages in the urban population by about 10 percent. Secondary education among the urban population has a similar association and, notably, is substantially higher among women. Postsecondary education is linked with a more than doubling in wages, especially among women, among whom wages associated with postsecondary education exceed the wages among men at the same level of education.

Expectations of High-Paying Government Jobs

Many South Sudanese expect a well-paid government job within six months and therefore raise their reservation wage beyond a realistic level. A World Bank report notes that 20 percent of men and almost 14 percent of women in South Sudan expect to hold government jobs within six months. Almost 40 percent expect to have jobs in the government after one year, and the rate increases to 50 percent for

among men and women expecting this outcome within two years. A lower share of people expecting government jobs within the next three-six months can be explained by the oil crisis in South Sudan at the time of the survey (May 2013).

The expectation of a government job increases the reservation wage by SSP 193 (World Bank 2014a). A government job is expected to provide SSP 7,200 (about \$1200) in earnings per month. The average government salary in 2011 was SSP 3,200 a month, about seven times the monthly gross national income (GNI) per capita. Yet, the expected wage for respondents anticipating government jobs was even twice as high, at SSP 7,200. It is estimated that, if all expectations were to be fulfilled, the government would have to increase its 2011 salary expenditures fourfold. The World Bank report notes that two in three unemployed workers have a prohibitively high reservation wage.

It is not possible for the government to provide jobs to all job seekers. Currently, there are about 150,000 civil servants in South Sudan (both central-level and state-level employees) and an equal number of military personnel. The number of new entrants into the labor market (with an increase in the cohort of 15–24-year-olds) over the next five years is estimated at around 1 million (World Bank 2014a). Assuming that the urban part of that labor force growth is around 20 percent, this suggests 200,000 new entrants in the urban labor force over the next five years, compared with around 150,000 existing civil service jobs. Even more importantly, the government jobs cannot help the country replace the oil resources that will run out in less than 28 years. At that time, government revenue will rely entirely on the private sector to generate taxes. It is true that new job seekers can be absorbed into the social sectors such as health care and education, but these needs will cater to qualified personnel. Public investment in labor-intensive infrastructure construction can create jobs among unskilled workers, while also creating the basis for additional private sector jobs.

To prevent widespread and unrealistic expectations of public sector jobs, the government should launch a campaign to clarify that government salaries are lower than people expect and that only a limited number of new public servants will be hired in coming years. Both messages would help lower expectations among the public and incentivize youth to look for jobs in the private sector by investing in marketable skills.

Two issues related to work expectation are the attitude toward work, especially among youth, and the dependency tendency. Traditionally, the South Sudanese are hardworking people, as seen in the industrial zones around Khartoum or in the construction industry in Khartoum. The current youth generation, however, was born into war and often became reliant on humanitarian aid. Given the issues associated with displacement from war and the issues of identify among many young people in South Sudan and the postwar conflicts over land among ethnic groups, young people are conditioned to living in an unstable environment and thus are conditioned to an insufferable state. Moreover, youth have not had an opportunity to invest in future skills and work experience.

“The wars have caused massive sociocultural shifts in work ethics, increasing the phenomenon of dependency of the majority of youth on the few employed relatives” (World Bank 2015). The report notes that “respectable work” meant office work and not menial labor, which appears to absorb migrant laborers from East Africa easily, and that there is the perception that women’s work, most of which takes place outside the formal economy, is not really work worth considering.

This condition is perpetuated by dependency. In urban centers across South Sudan, people who have

jobs, mainly people from the Greater Upper Nile and Greater Bahr el-Ghazal, are compelled by social obligations to sustain people without jobs. In large towns, the level of dependency on these social networks finds expression in the households of salaried government officials, which often host many relatives who rely on the salaried person for food, clothing, education fees, medical expenses, and so on. The level of commitment to this practice varies in degree, but can be found nearly uniformly in the homes of the Nilotic people, especially the Dinka and Nuer. Because a large proportion of central government positions are given to Dinka and Nuer, this dependency is abundant in the capital city. There are often additional responsibilities and obligations to relatives in rural villages, with the expectation that senior government officials supply urban goods to relatives in rural villages.

Labor Law and Labor Regulations

South Sudan's labor regulations are subject to frequent discretionary decisions. Between the signing of the peace agreement in 2005 and independence in 2011, the 1997 Labour Act remained the main legislative document for labor regulation in southern Sudan. Since independence, no new labor act has been ratified by the National Legislature. By the continuity of laws, the 1997 Labor Act is still valid. It is amended by circulars issued by the Ministry of Labour, Public Service, and Human Resource Development (MoLPS). Work permits, as an important tool to regulate labor, are issued exclusively by MoLPS and are often discretionary. National workers are protected against termination of employment. According to a circular of MoLPS, the ministry prohibits termination of employment for any business or organization without prior approval by the ministry. In practice, the ministry is reluctant to approve employment termination of South Sudanese nationals. The laborious and time-consuming process alone deters many employers from terminating contracts.

South Sudan's foreign work permit regulations are comparatively strict. Foreigners have to apply for a work permit, and application fees are high. Foreign companies are forced to hire South Sudanese nationals of similar qualifications and experience preferentially. Companies generally have to maintain an employment quota of 75 percent nationals at the non-managerial level. MoLPS now requires detailed information regarding vacant positions and will only issue work permits to foreigners if it is convinced that a South Sudanese candidate is unavailable. Small companies can only be run by South Sudanese, while medium and large companies are required to have a South Sudanese partner holding at least 31 percent of shares.

Excessive labor protection has the perverse effect of making national labor less attractive among employers. Many companies seeking to terminate the employment of nationals are taken to court for labor disputes, which, because of the financial cost and the loss in reputation, companies try to avoid even if they would win. To avoid these costs, companies sometimes opt to employ foreigners from neighboring countries, such as Kenya and Uganda. Foreign workers are said to work more efficiently, to be less costly, and to accept criticism by their supervisors (World Bank 2014a).

The new Labor Act proposed by the MoLPS in 2012 and currently under discussion will be critical in defining the quality of the regulatory environment. While not yet ratified by the National Legislature, the act as drafted contains a regulatory framework that establishes labor institutions, defines conditions for employment, and stipulates the fundamental rights of workers. It requires work permits for foreigners, as is currently the case. A minimum legal wage would be introduced, the effective enforcement of which, in a largely informal economy, is likely to be difficult.

Towards a sustained growth strategy

Given its landlocked situation and the finite limit of its oil wealth, South Sudan has no choice but to adopt a strategy to maximize its growth potential and create jobs, while developing its non-oil resources, mainly human resources, to replace oil. This strategy can only work if it is accompanied by policies to create jobs, especially light manufacturing jobs. The specific policies to address these problems are detailed in EGAT (2015).

South Sudan's non-oil economy could be competitive in regional markets in sectors in which South Sudan has a comparative advantage, such as agriculture and agribusiness. The domestic markets can also be developed in the beginning through import substitution because high transport costs create a natural advantage for domestic production. After a few years of experience, South Sudan could export to markets beyond the subregion.

While South Sudan is likely to carry out a mix of the two strategies, only a strategy focused on establishing competitiveness in domestic and regional markets can guarantee strong employment generation. This means that, even though import substitution could work for a period of 5–10 years (about the time frame to establish the presence of domestic producers, as shown in the case of the Republic of Korea), a shift toward an export-oriented strategy must be enacted in a timely manner.

Light Manufacturing in South Sudan

The above discussion highlights two structural features of the South Sudanese economy that adversely affect its competitiveness, namely, an overvalued exchange rate and high wages, especially in the formal sector. Another factor affecting competitiveness is the high cost of transport because of the country's landlocked position and the current state of infrastructure. Less than 5 percent of the existing 7,171 km of primary roads are in good condition, and, with the exception of newly constructed urban paved roads and the Juba Nimule road, the entire network is gravel, dilapidated, and mainly inaccessible during the rainy season (Tizikara and Lugor 2011). Freight tariffs in South Sudan are high, at least twice those found in the main African corridors and even in Sudan. Another factor is the relatively small population, which constrains the country's ability to consume goods and services. There is scope for niche opportunities in the processing of high-value products for the international market and in competing in some domestic or regional markets (for example, drinks and processed food). A rapid expansion of the formal modern service sector is also likely to be constrained by the low skill basis in South Sudan.

One of the potential problems is clearly electricity. Currently, South Sudan has the lowest per capita electricity consumption in Africa, according to the African Development Bank. Only 1 percent of South Sudan's population is connected to the electricity grid, and more than 96 percent of the population uses firewood and charcoal for household heating and cooking. Even those connected to the power network experience infrequent service because of aging equipment and limited maintenance. As a result, load shedding, or forced blackouts, are a regular part of South Sudan's power system. In December 2013, the African Development Bank announced that it would provide South Sudan with a \$26 million grant to expand the country's electricity distribution networks. The project will be undertaken by the state-owned utility, the South Sudan Electricity Corporation, but the project's progress is most likely stalled now because of the conflict.

All these obstacles are not insurmountable. To overcome them and compete effectively, South Sudan has to undertake a broadbased, carefully phased program of reforms to reduce its disadvantages. For example, a liberal and simple tariff system, well integrated into regional trading arrangements, would help reduce transit costs for imported inputs. The spatial structure and sequencing of investment in transport infrastructure would also have a critical effect on competitiveness. Given the low level of transport connectivity, the sequence and spatial structure of the new investment would give a first-mover advantage to those areas connected first or more cheaply. Beyond infrastructure investment, the efficient management of the transport and transit systems is also an important element of competitiveness. Transport costs are affected by the efficiency of border points and custom clearance and by formal or informal checkpoints that result in longer travel times and extra costs. Finally, lack of competitiveness in the trucking industry has often been found to increase transport costs as much as poor infrastructure does.

Over the long term, the priority of South Sudan should be to develop other resources that could replace oil in three decades. But what activities can South Sudanese pursue? This paper makes the case that, in the current situation, simple light manufacturing goods remain a viable option for urban dwellers. Urban-rural links mean that urban livelihoods are also important for the rural poor. Migration to urban centers, particularly secondary cities and rural towns, is an important livelihood strategy for rural people. This is illustrated by data from a rather unique panel study tracking more than 3,300 individuals in households in rural Kagera, Tanzania, during 1991/94–2010 (World Bank 2014). The study shows that half the individuals interviewed in 1991/94 who had exited poverty by 2010 did so by transitioning out of agriculture into the rural nonfarm economy or secondary towns; one in three exited poverty, while continuing in farming; and only one in seven through migration to the capital or other big cities. The urban economy, in turn, provides crucial goods and services that can help increase the productivity of rural economies and agriculture.

Why not services? The skills level in South Sudan appears low for high-value added service development. Quality higher education has a role with respect to the public sector and modern service sector. The limited employment that will be available in the public sector will require qualified personnel. In the modern service sector, the demand will be for higher skills. According to the World Bank (2014a), there were 17,000 students in South Sudanese universities in 2012 (which does not account for South Sudanese students studying abroad). With such a low number, aiming for a rapid expansion of enrolment would only come at the reduction of quality, which is already a major concern among university graduates in South Sudan. Moreover, nongovernmental organizations and foreign employers are competing to hire educated South Sudanese, putting additional pressures on the supply shortage. A focus on the quality and relevance of tertiary education could potentially ensure that South Sudanese graduates would be well prepared to take the limited job opportunities that will be generated for them.

Identifying Light Manufacturing Subsectors and Products in South Sudan

This section identifies specific subsectors and products for light manufacturing in South Sudan using the latest techniques. We examine the RCA approach, including both Balassa's method and import inspection, as well as the Lin-Monga growth identification and facilitation framework.

Table A6 summarizes, for 2012 and 2013, RCAs for products that South Sudan could possibly produce.¹⁴ The items in bold represent simple products that are labor-intensive, exhibit limited economies of scale, and require small investments that a typical developing country such as South Sudan could produce.

Table A6: Products That Have Non-oil Revealed Comparative Advantage, South Sudan

SITC	Description	Value ('000 USD)	Share of exports,	Share in non-oil exports	RCA	Light manufac- ture group
2012						
3330	Crude petroleum	643,471.0	99.56		Y	
6115	Sheep- or lambskin leather, w/o wool	1,566.9	0.24	55.56	Y	Leather goods
0542	Leguminous vegetables, dried, shell	660.6	0.10	23.42	Y	
2823	Other ferrous waste and scrap	148.6	0.02	5.27		
2112	Raw hides and skins of bovine	124.9	0.02	4.43		
2119	Hides and skins, n.e.s.; waste and	63.8	0.01	2.26	Y	
6116	Goat- or kidskin leather, without hair	61.4	0.01	2.18	Y	Leather goods
2922	Lac; natural gums, resins, gum	33.9	0.01	1.20		
6956	Knives and cutting blades for machine	24.9	0.00	0.88		Metal products
2116	Sheepskins & lambskins	17.4	0.00	0.62		
2475	Wood of nonconiferous species	10.2	0.00	0.36		
5513	Essential oils (terpeneless or not)	6.7	0.00	0.24		
2225	Sesame (Sesamum) seeds	3.6	0.00	0.13		
0751	Pepper of the genus Piper; fruits o	2.4	0.00	0.08		
5799	Waste, parings & scrap of other pla	2.3	0.00	0.08		
6342	Densified wood and particle board	2.1	0.00	0.07		Wood products
2923	Vegetable materials of a kind used	1.8	0.00	0.07		
6117	Leather of other animals, without hair	1.8	0.00	0.06		Leather goods
8422	Suits and ensembles	1.7	0.00	0.06		Apparel
355	Flours, meals & pellets of fish	1.7	0.00	0.06	Y	Food processing
8982	Musical instruments (other than piano)	0.9	0.00	0.03		
2013						
7933	Vessels & other floating structures	3,141.6	0.13	43.45	Y	
5429	Medicaments, n.e.s.	782.1	0.03	10.82		
6115	Sheep- or lambskin leather, without	754.6	0.03	10.44	Y	Leather goods

14. As discussed in the main text, the RCA is equal to the proportion of the country's exports that are of the class under consideration (E_{ij} / E_{it}), divided by the proportion of world exports that are of that class (En_j / Ent). A comparative advantage is revealed if $RCA > 1$. If RCA is less than unity, the country is said to have a comparative disadvantage in the commodity or industry.

6114	Tanned or crust hides and skins of	485.4	0.02	6.71		Leather goods
2631	Cotton (other than linters), not carded	448.1	0.02	6.20		
2112	Raw hides and skins of bovine	372.8	0.02	5.16		
2221	Groundnuts (peanuts), not roasted o	220.9	0.01	3.06		
8931	Articles for the conveyance or pack	135.5	0.01	1.87		
6116	Goat- or kidskin leather, without hair	120.0	0.00	1.66		Leather goods
2922	Lac; natural gums, resins, gum resi	115.3	0.00	1.59	Y	
2823	Other ferrous waste and scrap	73.5	0.00	1.02		
7163	Motors (other than motors of an out	57.0	0.00	0.79		
8412	Suits and ensembles	35.2	0.00	0.49		Apparel
2484	Wood of nonconiferous species spec	33.8	0.00	0.47		
7232	Mechanical shovels, excavators and	28.8	0.00	0.40		
2475	Wood of nonconiferous species, in	27.3	0.00	0.38		
0711	Coffee, not roasted, whether or not	25.7	0.00	0.36		
6631	Millstones, grindstones, grinding w	25.6	0.00	0.35		
2119	Hides and skins, n.e.s.; waste	16.9	0.00	0.23		
5534	Preparations for oral/dental hygien	16.3	0.00	0.22		
8455	BrassiFres, girdles, corsets, brace	14.4	0.00	0.20		Apparel
8319	Binocular cases, camera cases, musi	13.0	0.00	0.18		
6954	Hand tools (including glaziers' dia	10.0	0.00	0.14		Metal products
7414	Refrigerators, freezers	9.9	0.00	0.14		
8448	Slips, petticoats, briefs, panties,	7.9	0.00	0.11		Apparel
8312	Trunks, suitcases, vanity cases, ex	6.4	0.00	0.09		
7422	Fuel, lubricating/cooling medium pu	6.3	0.00	0.09		
5812	Tubes, pipes & hoses, rigid	5.2	0.00	0.07		
0571	Oranges, mandarins, clementines and	4.5	0.00	0.06		
7246	Auxiliary machinery for use with ma	2.8	0.00	0.04		
5817	Fittings for tubes, pipes & hoses	2.5	0.00	0.04		
2786	Slag, dross, scalings and similar w	2.2	0.00	0.03		
2733	Natural sands of all kinds, whether	2.2	0.00	0.03		
6423	Registers, account-books, note-books	2.1	0.00	0.03		Wood products

2690	Worn clothing and other worn textil	1.8	0.00	0.02		
453	Grain sorghum, unmilled	1.2	0.00	0.02		
2911	Bones, horns, ivory, hooves, claws,	1.0	0.00	0.01		
7164	Electric rotary converters	0.9	0.00	0.01		

Source: EGAT calculation from UN Comtrade.

The three methods yield the following sectors for South Sudan: (1) footwear, including sports shoes; (2) textiles; (3) vegetable oil; (4) fertilizers; (5) meat and meat products; (6) petroleum products; (7) leather and hides; and (8) food and beverages. Specific products related to these sectors are highlighted in Table A6.

In addition, South Sudan has potential in other products. The country is rich in natural resources, particularly oil and gas, but also in solid minerals. Industries associated with these natural resources, especially refined petroleum products, petrochemicals, cosmetics, and plastics are currently not particularly active in South Sudan.

Identifying the Binding Constraints on the Success of Firms in South Sudan

The primary source of information used in the identification process is the EGAT Entrepreneur Survey (see EGAT report). World Bank Enterprise surveys serve as a complementary piece to the Entrepreneur Survey. The EGAT Entrepreneur Survey is a modified version of a highly tested product which has been successfully conducted in China, Ethiopia, Tanzania, Vietnam, and Zambia (Fafchamps and Quinn 2012). The Survey covers selected areas within the investment climate, productivity, and logistics. In contrast to the World Bank Enterprise Survey, which is concentrated on major cities and integrated within the chapter, the Entrepreneur Survey data are focused on cities along the South Sudan–Sudan border. The EGAT Entrepreneur Survey results are more applicable to our understanding of South Sudan and it has a higher composition of manufacturing firms than the World Bank Enterprise Survey. It is therefore the primary data source. The Enterprise Survey is focused on a different geographical area in South Sudan and has a larger sample size. It enables information from the Entrepreneur Survey to be verified to a certain extent and to be supplemented where this is appropriate.

The World Bank Enterprise Survey (<http://www.enterprisesurveys.org>) is the secondary source of the analysis. The surveys are one of the World Bank's primary data sources on developing countries. They distinguish themselves from other data sources in the scope and detail of the data collection. Business data are available on 130,000 firms in 135 countries, representing the world's most comprehensive source of company-level information on emerging markets and developing economies. The surveys are run by a hired group of professional economists and surveyors. The surveyors are private contractors who are equipped with a cultural understanding of the areas in which they work. The surveys rely on a comprehensive methodology that measures constraints across areas fundamental to firm profitability and growth. They provide quantitative and qualitative information received directly from firm owners and top managers. They allow respondents to rate obstacles on a Likert scale to capture the most binding constraints entrepreneurs believe they face. This perspective cannot be found in general macro analyses or desk studies. Enterprise Survey data are collected every few years in the field. The survey data were most recently updated in March 2015.

In this section, these surveys are further complemented by Doing Business reports. These reports rely on interviews among local professionals such as accountants and lawyers. These professionals offer a different perspective relative to firm owners because their responses are based on laws and regulations, as opposed to the firm-specific constraints described in the Enterprise Surveys. A major limitation of the Doing Business reports is that they only cover the most populous business cities of countries and thus are not as representative as the Enterprise Surveys. Enterprise Surveys also provide actualized data, while the Doing Business reports illustrate a hypothetical of what a typical firm would experience. Doing Business assumes firms are abiding by regulations. In practice, many firms do not follow all regulations. Thus, the responses are better suited to understanding the impact of rules and regulations, while the Enterprise Surveys reflect a firm owner's pragmatic perspective.

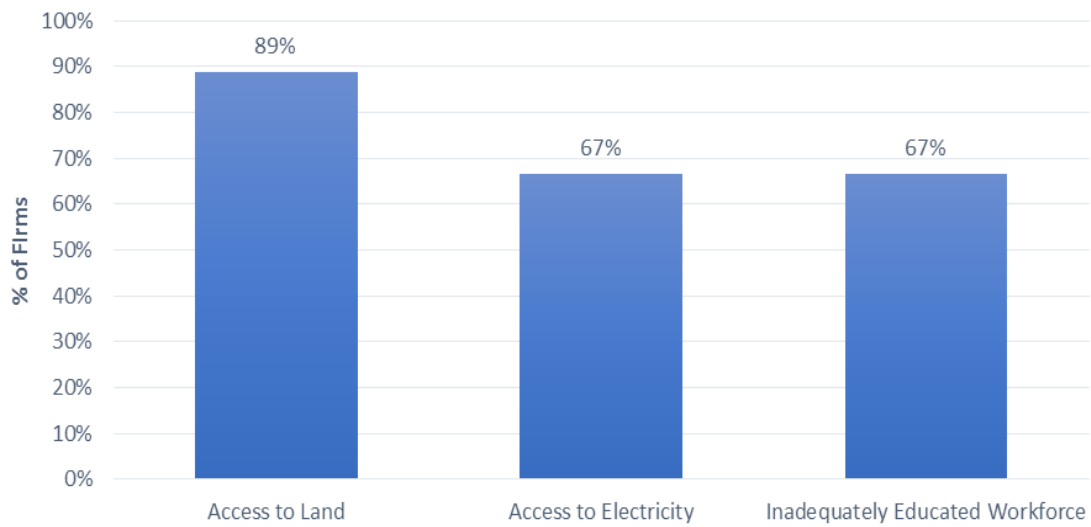
In the previous section, using a variety of methods, we identified specific light manufacturing products that have either a latent or a revealed comparative advantage in each country. The target subsectors with potential are food processing, leather goods, wood products, metal products, and textiles. Given these results, EGAT has been able to direct field consultants toward firms that produce these products. The EGAT survey has thus been used to target the obstacles that light manufacturing firms face in the production of goods with comparative advantages. This favors the quality of our recommendations to promote growth in light manufacturing. Although light manufacturing makes up less than 1 percent of total exports from South Sudan as a whole, the potential for a large manufacturing market already exists in South Sudan.

Constraints by Subsector

Metal subsector

The metal subsector faces obstacles in the ability to gain access to land. Almost 90 percent of respondents in the metal subsector claimed access to land is a major barrier to success (figure A4). Indeed, access to land was an even greater obstacle for firms than access to finance (see above). The metal subsector relies more heavily on land than other subsectors in light manufacturing. Metal products have a greater need for physical capital given the necessity to operate in a private space because of work at high temperatures. Metal work requires tools and can even demand heavy machinery. The burden is compounded by the competition for land with service firms.

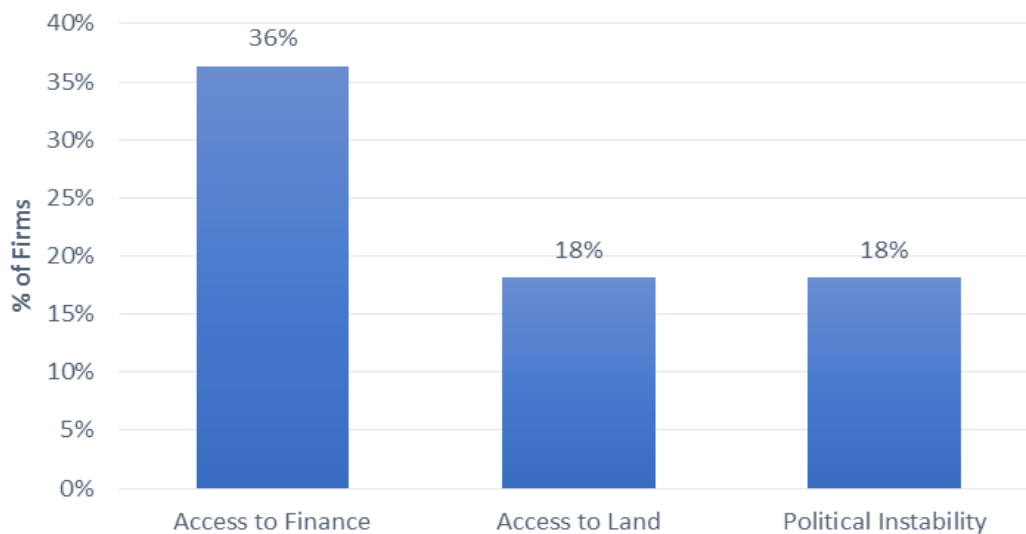
Figure A4: Metal Subsector: Biggest Obstacles (EGAT Entrepreneur Survey)



Source: EGAT Entrepreneur Survey 2015.

The requirement of seven different inspections for the construction of a warehouse has likely burdened metal firms in their pursuit of establishing land capital. At a higher fee rate as well, metal firms are at a disadvantage relative to global competition. Additionally, access to electricity presents an obstacle for firms. Many firms are unable to access electricity at a rate that maintains their capacity to produce. Especially with metal work, electricity requirements are high because of the necessity of high temperatures. Moreover, metal work requires a high skill set. Without a skilled labor force, metal firms are unable to add employees and expand. The World Bank Enterprise Surveys confirm that access to land is a major obstacle for metal firms (figure A5). Access to land was the second-most binding constraint reported by metal firms reporting their most binding constraint.

Figure A5: Metal Subsector: Biggest Obstacles (World Bank Enterprise Survey)

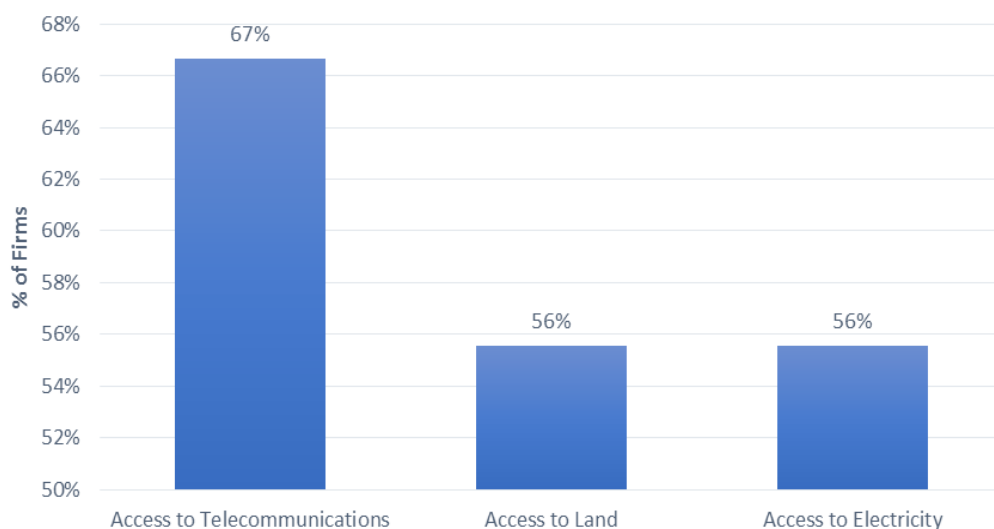


Source: EGAT calculations based on World Bank Enterprise Surveys.

Wood subsector

The wood subsector faces unique challenges. Access to land and electricity are both major obstacles, as they are in the metal subsector, but access to telecommunications is the biggest obstacle among wood firms (figure A6). Given the wood subsector's lower capital constraints, the need for land is a higher priority for metal firms. Telecommunications are important to wood firms for communication to suppliers and customers. Expanding business largely depends on the ability to reach out to customers and supplying those customers with product.

Figure A6: Wood Subsector: Biggest Obstacles (EGAT Entrepreneur Survey)

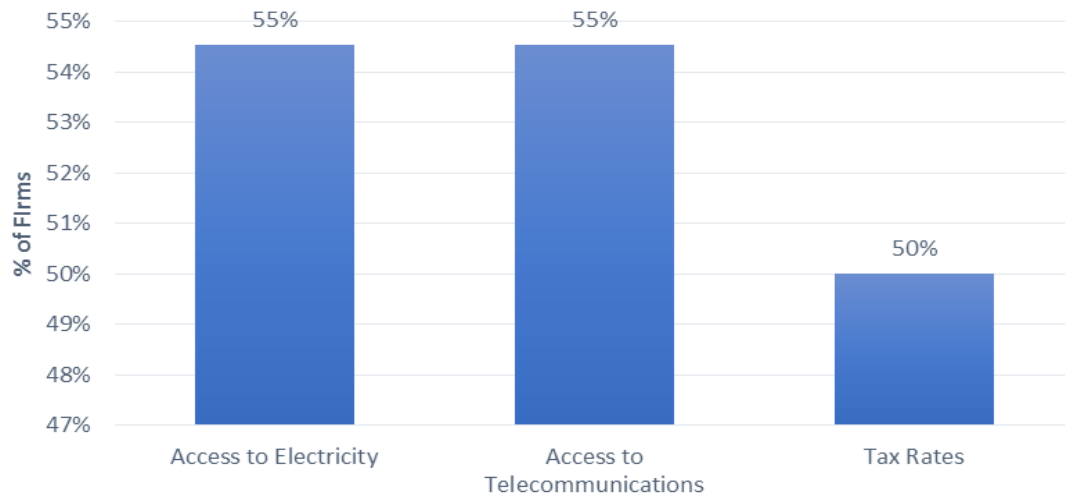


Source: EGAT Entrepreneur Survey 2015.

Food and beverage subsector

Without considering the obstacles affecting all manufacturing firms, the biggest obstacles facing the food and beverage subsector is access to electricity and access to telecommunications (figure A7). Food and beverage firms rely on electricity for cooking and refrigeration. Firms without electricity are unable to produce and store their products. Inconsistent access to electricity poses fundamentally prevents production. Developing a consistent power grid is an important step in promoting this subsector. Tax rates are an obstacle in the subsector largely because products travel more often and thus encounter import and export processes. Customs taxes and the overall formality of food production make taxing more accessible for the government in this subsector, which is thus a big source of revenue given the large informal sector in South Sudan.

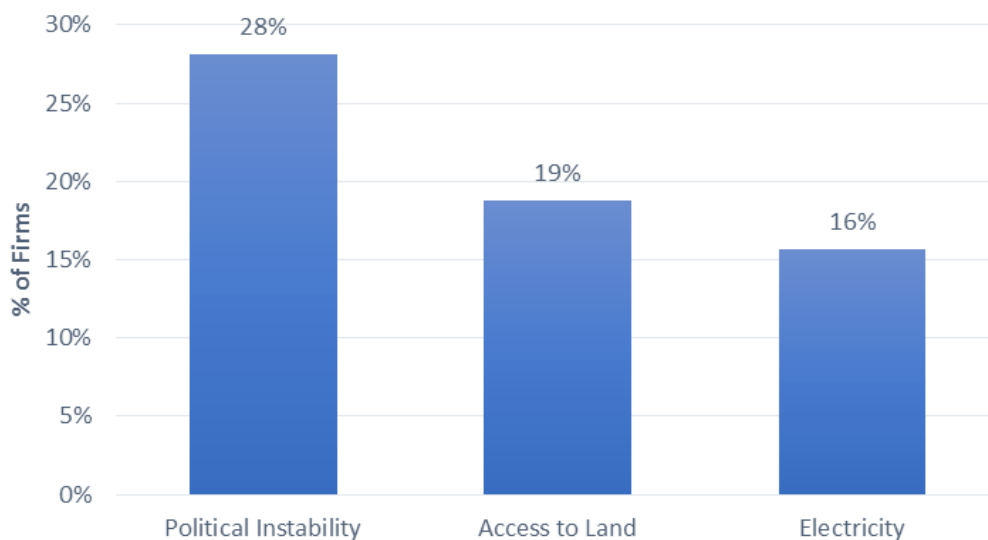
Figure A7: Food and Beverage Subsector: Biggest Obstacles (EGAT Entrepreneur Survey)



Source: EGAT Entrepreneur Survey 2015.

The Enterprise Surveys confirm that electricity is one of the top obstacles in the food and beverage subsector (Figure A8). Given the subsector's current presence in the South Sudan economy, priority should be assigned to this subsector during the policy implementation process.

Figure A8: Food and Beverage Subsector: Biggest Obstacles (World Bank Enterprise Survey)



Source: EGAT calculations based on World Bank Enterprise Surveys.

Apparel

For the apparel firm EGAT was able to interview, access to telecommunications and an inadequately educated labor force were top constraints. For the garment firm the Enterprise Survey was able to interview, access to finance was the most binding constraint. Leather products were unable to be found in both EGAT's field survey and the World Bank's Enterprise Surveys.

Policy Recommendations

The challenges confronting policy makers in South Sudan are tremendous. Pervasive poverty, low economic growth, poor human resources, and extreme dependency on natural resources are overwhelming problems. Our analysis makes clear that South Sudan has no choice but to develop human resources to replace oil when the oil reserves are exhausted.

But, as economic history has shown us, countries that develop human resources without complementary policies to develop private sector-led growth are likely to fail. This is the case not only of Eastern European countries, but of many Asian and African countries as well, where the drain of human resources has taken place because the demand for skilled workers cannot keep up with the abundant supply of workers. Moreover, industrialization can only emerge from learning by doing, and there is no way to bypass the first stage of economic growth whereby producers of simple goods gradually move up the value chain to produce more sophisticated goods.

The policy recommendations offered in this paper apply these principles to South Sudan along the policy framework presented in the main text, drawing on extensive research on Africa. The following section outlines economy-wide policies that will affect the performance of manufacturing in South Sudan. This is followed by a discussion of specific policies in each of the light manufacturing subsectors.

These recommendations in part are based on the five lessons from East Asian countries in growing the light manufacturing sector to create jobs and prosperity. These include: i) filling knowledge and financial gaps through FDI and networks; ii) using substitution policies and sequencing. As Gerschenkron (1962) and Hirschman (1984) long emphasized, human ingenuity can devise workable substitutes for the key missing requisites for rapid growth. iii) starting with simple goods and experimenting with different policies to expand them, scaling up successful cases and cutting back failing ones; iv) creating islands of success. Reforms in specific industries or specific locations can create islands of success in an otherwise moribund economy. And, with success built upon success, the impact on the general economy can be significant; v) creating a conducive business environment for manufacturing. This environment should involve active government support for private enterprises. Foremost among possible official actions should be forceful public endorsements issued by national leaders in favor of economic growth and private sector development.

Economy-wide Policies

The industrial sector in South Sudan would also benefit from economy-wide policies that include peace and security, macroeconomic stability, building infrastructure (including resolving trade logistics issues), and developing human resources.

Peace and Security: The EGAT Entrepreneur Survey conducted in South Sudan shows that firms of all sizes consider security a top priority. While substitution policies such as clusters (below) can temporarily help industrial development, ultimately the success of any development strategy depends on whether long-lasting peace and security can prevail. This subject is beyond the scope of this paper but it suffices to stress the importance of political stability and security.

Macroeconomic stability: Experience in other African economies clearly shows that governments can

provide important support to facilitate robust private sector growth by maintaining macroeconomic stability and implementing sensible long-term policies for managing important natural resources. African governments have recorded marked improvements in macroeconomic policies during the past decade; results include lower inflation, reduced fiscal and trade deficits, and, partly as a result, higher GDP growth. For South Sudan, the most important policy among the macroeconomic stabilization policies is exchange rate unification to the market rate. An appropriate exchange rate would make South Sudan (as well as the rest of South Sudan) competitive with imports and other countries in the region. Similarly, keeping the Sudanese exchange rate competitive will help the tradable sectors in South Sudan of Sudan.

Infrastructure: Building roads, boosting electricity generation, and enhancing trade logistics are a top priority for South Sudan. However, one must be realistic about the time horizon of building a solid infrastructure. Addressing infrastructure needs in South Sudan is a time-intensive challenge and cannot be achieved in one or two decades. Part of the difficulty is that the infrastructure deficit has been caused by years of neglect associated with war and poverty, but also by Africa's geographical characteristics, which include low population density, low rates of urbanization, landlocked locations, and relatively small economies.

Regulatory policy and foreign labor management: In South Sudan, the regulatory system is a burden, especially for employment termination. Among the main regulatory measures is the discretionary nature of circulars; lengthy and strict termination procedures, even in cases of fraud or misbehavior; and the establishment of a quota for foreign employees. Given the low level of worker skills and the government's weak enforcement capacity, South Sudan must create simple termination procedures and achieve uniform and market-compatible minimum wages, while protecting employees against labor exploitation.

Another key issue to address is the balance between the need to employ nationals and the need to bring foreign workers with scarce skills. This will become increasingly important in South Sudan as industrial development progresses. Given that skills are one of the critical binding constraints in light manufacturing, promoting incentives for on-the-job training should be encouraged. Countries around the world have experimented with a number of different active labor market programs aiming to increase employment. Most common are programs such as job-search assistance, wage subsidies, training, and public works. Such labor market programs can match employers with job seekers. They can provide training, especially where employers, workers, and job seekers underinvest in training. They often buffer an economic downturn by creating temporary jobs or by creating additional incentives for the private sector to hire more workers. Wage subsidies that are linked with training can also increase employment. Experience around the world shows that linking wage subsidy programs, especially among youth and the low skilled, with training could raise employment among disadvantaged groups.

Skills upgrading: Addressing the low skill base of South Sudan is a priority and requires the urgent establishment of a quality universal primary education system that can feed into an expanding secondary and tertiary system. Other measures include finding ways to impart marketable skills to people who are beyond the schooling age. The role of government is critical in this area because of the nature of externalities. Given scarcity of skills, employers are keen to provide on-the-job training. But they face a high risk that, once trained, workers will move to other jobs or competitors. Hence, this responsibility is bestowed on the government because society as a whole benefits from workers with higher skills. In both countries, the educational background is relatively better among the young urban male population than among other demographic groups, and a good share have completed primary education. Vocational

training has been put forward as a key instrument to bridge the gap between basic education and marketable skills.

Overall Sector Policy

Industrial Clusters: In the context of South Sudan, industrial clusters are the best way to deal with a plethora of binding constraints. The agglomeration of enterprises and institutions that are involved in similar or related business within a limited geographical area has long been recognized as an important part of building an economy (Marshall 1920). However, only recently has this strategy been recognized as a solution to overcome obstacles in access to inputs, industrial land, finance, trade logistics, entrepreneurial skills, and worker skills that affect business and industrial development in low-income economies (Dinh and others 2012). Once firms integrate into a cluster, the entry costs for following firms are lower because of positive external economies¹⁵ (Fujita, Krugman, and Mori 1999). Still, because the solutions offered by a cluster strategy are unique to each country and because firms in particular industries may grow in different ways to break free of local constraints, a cluster strategy must be tailored to the specific features of an economy.

For each subsector, governments should first find out where enterprises are already clustered-- and should ease the most binding constraints within the clusters. Thus, for example, the above analysis has shown that that for wood products, the most binding constraints are access to telecommunications, land, and electricity. Obviously, South Sudan cannot provide access to these three services to everyone in the country, or even in a city, but national government and local government in South Sudan can help firms within the wood cluster have access to these services. The growth of these firms, in turn, will grow the tax base in the long run.

Industrial parks: Successful industrial parks provide enterprises with security, basic infrastructure (roads, energy, water, sewers), streamlined government regulations (through government service centers), and affordable industrial land. Industrial parks also provide technical training, low-cost standardized factory shells that allow entrepreneurs to plug and play, and housing for workers next to the plants. By helping small enterprises grow into medium and large enterprises, China, for example, has avoided a shortage of medium firms—the missing middle—faced by most Sub-Saharan countries. In China, plug-and-play industrial parks have greatly reduced the startup costs and risks for small and medium enterprises that have sufficient scale, capital, and growth prospects to take advantage of larger facilities at a phase in their development when they are unable to obtain bank loans. They have also facilitated industrial clusters, generating substantial spillovers as well as economies of scale and scope for Chinese industries. The clusters are promoted through government support for input and output markets.

The African experience with industrial parks over the past two decades—which has mostly involved traditional export processing zones and industrial parks—has not been successful. With the exception of Mauritius and the partial (initial) success of Kenya, Lesotho, and Madagascar, most African zones have failed to attract significant investment, promote exports, or create sustainable employment. Only Mauritius has used industrial parks as an effective vehicle to support economic transformation. Among the causes for this poor performance have been poor strategic planning and a mismatch of comparative advantages; poor locational choices; insufficient investment in infrastructure; and above all, a lack of high-level support and policy stability.

15. Externalities are factors whose effects are not reflected in the market price of goods and services.

South Sudan should aim to develop such plug-and-play industrial parks next to main towns so as to maximize the scale of operation and eliminate high inland transport costs in the two countries. However, learning from the failure of industrial parks in other African countries, it should first let the private sector decide where they form organic clusters and then help guide and develop these clusters into industrial parks. China's experience in the development of clusters substantiates the argument that the government's role is to support existing cluster firms rather than try to create clusters from scratch. Once clusters expand, the public sector should then become more active in developing general infrastructure (roads, utilities, land) and facilities to meet the specific requirements of emerging clusters (market structures, financial institutions, training programs, quality control mechanisms, and so on). As in China, industrial parks bypass difficult land reform, which can take years to implement. The governments can test a variety of policies before applying them broadly. The demonstration effects overcome political economy constraints.

FDI: Many studies have documented the significant role of FDI in economic development around the world. The experience of numerous economies, including Australia, Canada, Singapore, Taiwan (China), the United States, and, most recently, China and Vietnam, shows how foreign investment has spurred the growth of output, investment, employment, productivity, and exports. FDI contributes to the structural transformation of host economies, technology adoption, and industrial upgrades among domestic firms. FDI enables host nations to gain access to world markets for goods, technology, and capital. FDI, however, is more pronounced in some industries than others. FDI made particularly large contributions to the recent expansion of both China's and Vietnam's apparel industries. China's open-door policy, which marked the beginning of a strong relationship between foreign and domestic investors, helped China become the number one host of foreign capital among developing nations and the biggest exporter of manufactured products, including apparel. Shenzhen's astonishing transformation from a sleepy village to a central component of China's industrial explosion epitomizes the potential of foreign investment.

South Sudan needs to open up and attract FDI on a mass scale, particularly in labor-intensive activities such as those that can develop in South Sudan. Wages will be competitive when the exchange rate is unified and other measures proposed in this report (see logistics below) are adopted. The importance of FDI needs to be stressed by the top policy makers in each country and progress in this area needs to be monitored on a regular basis. The success of Ireland's Industrial Development Authority in the 1960s illustrates this point. The FDI promotion agency was set up in the Office of the Prime Minister and played a critical role in the three phases of the foreign investment cycle: recruitment and screening, embedding, and aftercare.

Logistics: South Sudan should harmonize and improve customs procedures by simplifying procedures and leveraging information technology, particularly along their common border. Delays in customs procedures incur storage costs for containers waiting at the border to be cleared. And the delays and uncertainty for customs clearances damage the reputation of local firms and reduce the prices they can negotiate with global buyers. In the long run, South Sudan and Sudan should also develop hard infrastructure to support multimodal systems combining trucking, railways, airways, and shipping to improve connectivity and increase competition. Furthermore, governments need to increase competition among freight forwarders, shipping, and trucking companies by removing price controls and the restrictions on FDI.

There is a need to greatly simplify the streamlining of procedures and to avoid duplicative and repetitive checks. The process for obtaining all the necessary import and export approvals can be long and

time-consuming, especially if laboratory testing is required. In addition, there is a need to adopt a risk-based compliance management approach instead of the existing 100 percent real time documentary and physical intervention in all transactions. In addition to improving levels of trade facilitation, adopting advanced risk management strategies would help improve border security outcomes by directing resources to interventions in high-risk transactions. Previous studies by the World Bank have demonstrated that a lower rate of inspection, as part of a risk-based targeting strategy, can actually result in increased detections by being more effective.

The limited opening hours of the South Sudanese customs also cause significant fluctuations in the daily volume of traffic, hence the volume of customs work, with high concentrations on Mondays. Poor customs infrastructure and staff capacity are serious binding constraints at South Sudanese customs. The lack of modern data management and communication system makes customs administration inefficient, particularly in terms of inter-office data verification and communication among different customs offices.

Reducing input costs: To help enterprises in South Sudan deal with input costs and availability, the authorities should also adopt a two-pronged strategy: they should facilitate access to inputs for light manufacturing by working to improve trade logistics and push to deepen regional integration; at the same time, they should promote efforts to develop the potentially competitive industries that supply key inputs for light manufacturing. Among important policies in this regard are (1) remove import tariffs on all inputs for light manufacturing, even for products destined for national and regional markets; (2) remove restrictions on the exports of key light manufacturing inputs. Export bans are well intentioned, but self-defeating. The objective is to secure a sufficient and cheap supply of raw materials to encourage the domestic processing of goods such as cotton and leather. But prohibiting exports eliminates an important component of demand for these products. This may cause an unintended chain of damaging consequences: reduced output of the targeted materials, increases in their domestic prices, erosion of potential cost advantages for manufactures, and a reduction (rather than the intended increase) in domestic processing of these materials.

Here, we discuss input industry issues in general and propose general solutions. But further in-depth technical analysis of these input industries will be needed on each individual State in or area of South Sudan to solve industry-specific problems such as how to facilitate the entry of competitive producers in livestock (leather and milk), food staples (wheat), industrial crops (cotton), and sustainable forestry (wood) in a way that benefits local communities and preserves the environment. From a political economy perspective, existing distortions and restrictions in input industries inevitably provide benefits to stakeholders even while they impose much larger costs on the economy by impeding manufacturing growth, the expansion of employment, productivity, and exports. In proposing and implementing reforms, an analysis will need to identify the trivial consequences of reform and demonstrate that the private sector losses arising from reforms will be dwarfed by large-scale, economy-wide benefits following successful implementation of the reforms.

Public-private cooperation: In many African countries, the government views the private sector with suspicion, adopting a naïve zero-sum perspective that considers private profit as a consequence of the exploitation or victimization of workers or customers and concludes that the state should capture and redistribute business profits. Such a view consequently pits the private sector against the government, creating the perception that the government undercuts hard-earned profits from entrepreneurs. This relationship cannot and should not exist in South Sudan.

To help grow the light manufacturing sector, policy makers in South Sudan have to cooperate with their respective private sectors and work to overcome the obstacles that hold back private enterprise. Ideally a council with representatives from both the public and private sectors would be an appropriate step toward reform such as the Joint Border Commission. Measures to encourage the establishment of trade associations to help promote the interests of the private sector should be implemented. Moreover, government officials could be tied into an incentives framework that bases their promotions on private sector development.

Sub-Sector Potential and Policy Reforms

Textiles and apparel

As discussed above, the main constraints in textiles and apparel, at an aggregate level, are logistics, security, and access to finance. Experience with other African countries and developing countries in general indicates that resolving these three constraints is time consuming, especially in an environment with inadequate resources. This report recommends that policy makers in South Sudan and nationally undertake interim measures to help produce low-value and niche products, such as uniforms and ethnic clothing, for the domestic and regional markets, areas which face low levels of competition from Asian exporters. Given a shortage in domestic financing and skilled manpower, South Sudan must seek FDI.

Policy makers should actively promote clusters, by designating specific areas for light manufacturing activities and by prioritizing the provision of electricity and roads connecting to major consumer markets (see above). Over time, these areas will become industrial zones and direct policies to promote them can be designed.

Several constraints could be eased simultaneously if a plug-and-play industrial park were available. China has shown that such parks can assist firms by providing affordable access to industrial land, standardized factory shell buildings, and worker housing, as well as training facilities and one-stop shops for complying with business regulations. Industrial parks lower the financing costs and risks for well-performing small firms, allowing them to grow larger even if banks consider them too risky for loans.

The competitiveness of the textiles and apparel sector in South Sudan can be enhanced by reducing the time required to prepare import and export documents. This calls for strong regional cooperation and coordination among agencies. Regional cooperation is even more critical for improving the efficiency of border crossings that affect South Sudan's trade, but are not under the control of the governments of South Sudan and Sudan, such as the intermediate border crossings with third countries.

Labor efficiency in South Sudan is at low levels because of poor worker skills and motivation, outdated equipment (resulting from a long period of industrial decline and lack of investment), small-scale operations, and captive customers. Interviews conducted for this study identify worker skills as a major concern among managers at apparel firms. The governments should encourage workers and managers with the training, incentives, and equipment necessary to improve productivity and product quality, and international donors should support this. Engaging foreign investors in initiatives to upgrade technology and providing technical assistance to train local workers and managers could help Border Region apparel firms boost their productivity and the quality of their products. Chinese firms are much more likely than South Sudanese firms to rely on external experts when introducing new products, changing technologies,

or modifying distribution systems, which gives them a strong advantage.

Leather products

South Sudan has the potential to increase its supply of leather products to domestic and regional markets, as well as its exportation of wet-blue and finished leather. The sector benefits from some advantages that could support greater competitiveness over time. Currently, South Sudan and Sudan together have the largest cattle industry in Africa. There is potential to expand the cattle industry by utilizing South Sudan's extensive grazing land (currently exhibiting low cattle density) to meet the domestic and regional demand for beef and dairy products. The leather industry—largely undervalued by-products of the beef and dairy industries—could be expanded in conjunction with these industries. Among the problems faced by this subsector is a failure by farmers to appreciate the potential value of hides and skins. When combined with a lack of knowledge and training, this leads to poor branding, slaughter, and preservation techniques that damage hides and skins. High transport costs and high import tariffs on inputs contribute to the high cost of imported materials.

Among the most immediate measures policy makers can enact is to attract foreign investors. Particularly in tanning, additional foreign investment can boost productivity and quality and strengthen the links between South Sudan's leather products sector and the regional and international market. Another measure is to facilitate knowledge sharing. South Sudan's leather products sector could benefit from better management and design skills, especially if facilitated by external experts. Donors can play an important role in helping to locate and even finance these experts. The survey of small and medium firms in Africa conducted by the World Bank (Fafchamps and Quinn 2012) finds that one of the main reasons China rapidly industrialized was that Chinese firms rely on external experts at start-up and at subsequent stages (the introduction of new products, changes in technology, modifications in distribution systems). In addition to standard managerial and technical training, South Sudan's leather goods sector could benefit from foreign involvement in up-to-date design skills, which would allow firms to manufacture more fashionable products that would appeal to high-end, regional, and international markets. Another way to foster the skills needed to manufacture leather shoes competitively for domestic and regional markets is through collaboration between trade schools and small and medium producers of simple leather products in developing countries. South Sudanese firms should also seek to learn from their regional peers to share lessons related to the leather sector. Better trade logistics would reduce production costs and the shipping process. Efforts to improve trade logistics should be undertaken in collaboration with neighboring countries.

Over the longer term, South Sudan can increase the availability of high-quality leather by promoting the development of the livestock industry. Targeted actions can be taken to encourage the leather, beef, and dairy industries. Efforts to expand the beef and dairy industries will also benefit the leather products sector by increasing the quantity and quality of hides. Benefits include (1) improved disease control, (2) improved breeding and feeding practices, and (3) educated traditional farmers. In particular, educating traditional farmers and improving their animal husbandry skills and market awareness could greatly increase cattle numbers, productivity, and hide quality.

Wood products

The main opportunity for South Sudan's wood products is in the domestic market. Greater international competitiveness might be achievable over the long run with improvements in transport, technology, supply chains, and access to reasonably priced wood. South Sudan exports mostly raw wood and reimports processed wood from other countries, such as standardized low-cost furniture. For example, in 2013, South Sudan imported wood and wood products worth approximately \$1.3 million. South Sudan exported wood products worth less than \$1 million, creating a negative trade balance. The domestic market, mainly the construction industry, consumes most of the processed wood products, including sawn wood. The sector does have a lot of potential as South Sudan has a comparative advantage in growing trees for wood. Over the medium term, the sector could focus primarily on the domestic market to support the construction industry and to meet the demand for products that are currently being imported, but that are relatively simple to make.

Several factors prevent South Sudan's wood products from achieving international competitiveness. These factors include low labor productivity, low capacity utilization, poor managerial and worker skills, old technology, weak supply chains, and market segmentation. Transportation costs for lumber in South Sudan can be high. Importing wood from abroad is also expensive because of international transportation costs. For this reason, wood products have substantial potential for import substitution, contingent upon improvements to managerial and worker skills.

The poor management of the production process and inadequately trained workers are reflected in low-quality products, low labor productivity, and the wasteful use of expensive consumables. In South Sudan workers lack basic education, as well as more specific technical and managerial expertise. Most of the activities take place in the informal sector, which is able to produce at lower costs than the formal sector, to as little as one-third of the costs. This is because informal enterprises benefit from lower overhead, the possibility of tax and fee evasion, the use of manual tools (hence, lower capital and electricity costs), and, in many cases, access to illegally obtained wood. The outcome is a lower-quality product, but one that nonetheless appeals to a large segment of the domestic market (where price is the key consideration).

Policy recommendations in this subsector include (1) improve competition and efficiency in the supply of wood, (2) encourage investment in private wood plantations (which China, Tanzania, and Vietnam have all done successfully) that are close to the main production and demand centers in South Sudan to minimize transport costs; (3) encourage foreign investment in furniture manufacturing; and (4) develop plug-and-play industrial parks and facilitate clustering. Establishing industrial parks could improve the access of smaller firms to utilities, land, finance (using land and machines as collateral), and skills (technical assistance programs, particularly targeted at managers). To improve the efficiency of the supply chain, the parks could incorporate a hardwood drying plant supported through a public-private partnership so that individual producers would not need to invest in expensive subscale drying facilities. A major policy challenge for the government is to find ways to enable informal sector firms, which make up most of the sector, to adopt modern technology and access better information (for example, by helping clusters of informal sector firms specialize, invest, and link up with formal sector firms and markets).

Metal products

EGAT survey indicates that there are a lot of economic activities in this subsector. Many of these firms are small and are operating in the informal sector. The potential for this sector is large over the long term because growth in the domestic and regional manufacturing sectors could boost the demand for fabricated metal products.

Many of the constraints affecting the metal products industry are similar to those affecting light industry in general: poor managerial and technical skills and a lack of modern equipment. These constraints especially affect small and medium enterprises. The solutions to these problems include developing plug-and-play industrial parks, which would facilitate the access of small and medium metal product fabricators to utilities, land, finance (using land and machines as collateral), and skills. The governments may also want to establish a business incubator¹⁶ in South Sudan for informal, indigenous firms: international experience has demonstrated the utility of incubator programs, while a survey of micro, small, and medium firms in neighboring countries has found that training and the development of business networks could increase efficiency and competitiveness. In conjunction with an industrial park, a business incubator could meet several of the following needs:

- **Information:** A relatively low-cost information package might include details on product specifications and prices, as well as sources of the steel and machinery required and the distribution outlets that sell the products.
- **Training:** If a critical mass of technical capabilities can be developed in the metals industry, spillovers in the form of a well-trained cadre of workers and firm owners could motivate formal sector metal firms to outsource and diversify products with possibilities for export. Options include technical assistance programs, particularly for firm managers, and kaizen training¹⁷; firm financed, machine-specific training provided by equipment suppliers; the use of extension workers to conduct regular on-site visits to assess the evolving needs of smaller firms and provide hands-on assistance; and trade schools to provide subsidized technical training (perhaps established and operated through collaboration among developing countries, but requiring public investment).
- **Access to raw materials and equipment:** Access to inputs and equipment could be improved through government-facilitated imports of metals and machinery. The government could also provide marketing support by subsidizing advertising for the new products produced in the incubators. Certification that South Sudan metal products meet international quality standards could also improve marketing, and the government may be able to assist firms with certifications.

Agribusiness

Most production costs in agribusiness are associated with raw materials. Consequently, the actions that are most critical to improve South Sudan's competitiveness in agribusiness are on the agricultural production side of the supply chain, reducing the cost of growing crops and rearing livestock, while enhancing agricultural productivity.

16. A business incubator is a company that helps new and startup companies to develop by providing essential services such as management training or office space.

17. Kaizen is a self-help approach to efficiency improvements in organizations, also called lean manufacturing, which includes performance-based human resource management, continual analysis and refinement of quality control procedures, inventory management, and planning. Developed in the manufacturing sector in Japan, the Kaizen approach has evolved into what is now a standard set of modern management practices in Europe and the United States.

South Sudan has great potential for agricultural production. It has a large area (approximately the size of France, with a population of 11 million). At present, less than 5 percent of the land is cultivated, mostly in the greenbelt zone in the southern part of the country and along the Nile River and its tributaries. The Food and Agriculture Organization of the United Nations and the World Food Programme estimate that South Sudanese farmers produce, on average, 0.95 metric tons per hectare, about 60 percent of the output of Ugandan farmers. However, there is potential for commercial farming. For example, Upper Nile State, which has historically had much commercial farming because of its proximity to Sudan, is starting a local effort to survey and demarcate land on a county-by-county level. Most commercial farms still rely on traditional labor-intensive farming methods because machinery remains difficult and expensive to acquire. Virtually all existing projects are self-financed because bank loans are unavailable.

Among measures to improve the performance of this subsector are:

- Raise agricultural productivity by increasing the adoption of improved technologies through improved access to agricultural extensions and farm demonstration services.
- Improve seed production and distribution. This is often the most important critical first step in developing a competitive agriculture sector. Indeed, there is little point in investing in fertilizers, skills, and irrigation if high-yielding seeds are not available.
- Facilitate access to finance to smallholders in agriculture, livestock, and forestry. Smallholders should be able to use land, livestock, and agricultural outputs as collateral.
- Facilitate access to land by strategic investors in the agriculture, livestock and sustainable forestry sectors.
- Provide technical assistance to smallholders. This can help smallholders connect with strategic investors in agriculture, livestock, and forestry through contract farming around nucleus farms and plantations and also encourage them to respond to new market opportunities. For example, if veterinary extension services can teach smallholders to protect cattle from pests, this would enable them to supply hides of acceptable quality to tanneries serving emergent manufacturers of leather goods.
- Provide public goods in agriculture, livestock, and forestry. Impose disease controls, promote standards, fight illegal logging, and reduce taxes on legal wood.

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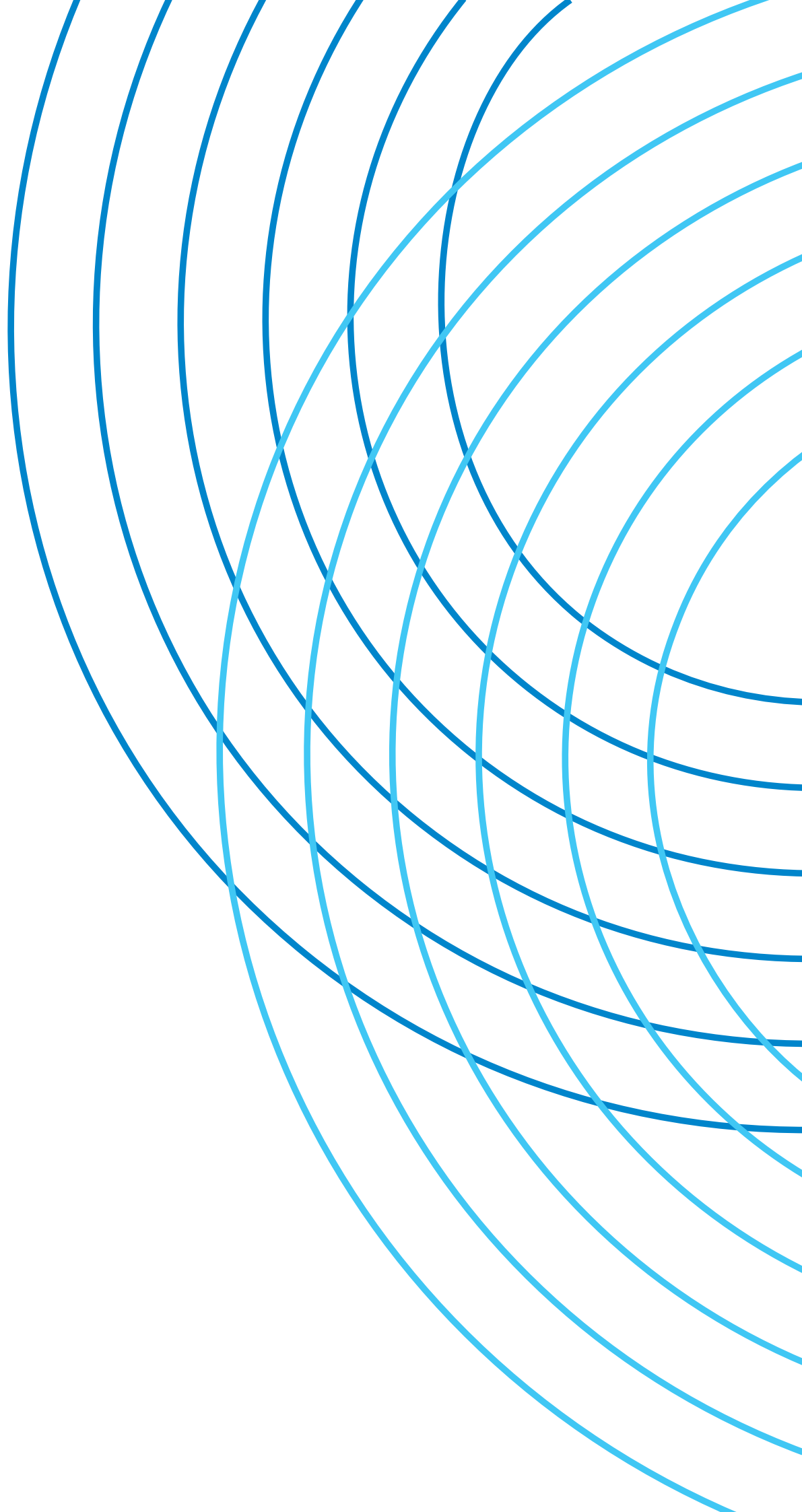
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OCP Policy Center

Ryad Business Center – South 4th
Floor – Mahaj Erryad – Rabat Morocco

Website: www.ocppc.ma

Email: contact@ocppc.ma

Phone: +212 5 37 27 08 60

Fax: +212 5 37 71 31 54

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