

Africa's competitiveness: What do natural resources have to do with it?

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Abstract:

Slow growth in manufactured and agricultural exports have been attributed to the high share of natural resources in many African economies. Not only does the resource sector draw labor and capital away from other sectors, but the spending of resource revenues in the domestic economy bids up the price of non-tradable goods, making the traditional tradable sector less competitive. This paper argues that an important and neglected linkage is through the public sector. Since government receives a large portion of resource revenues, the public sector booms alongside the resource sector. But the government is largely unaccountable for the spending of these revenues, since they are not raised via taxes on citizens. The result is pro-cyclical fiscal policies, macroeconomic instability, costly investment projects, a bloated public sector, and leakage of public funds, all of which further work against private-sector competitiveness. One solution may be to transfer natural-resource revenues directly to citizens and then tax them to finance public expenditure. The increased accountability could improve the effectiveness of the public sector and therefore the competitiveness of the private sector.

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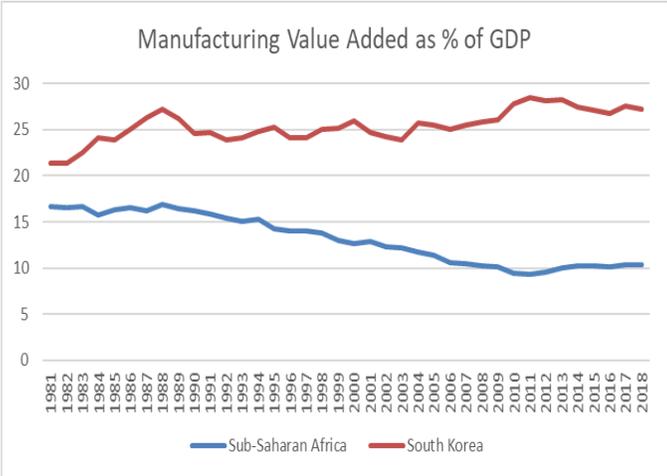
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Section 1. Competitiveness and natural resources endowment in Sub-Saharan Africa

1.1 Competitiveness in Sub-Saharan Africa

The weak competitiveness of Sub-Saharan Africa (SSA) is captured by outcomes as well as policies and regulations. Figure 1 displays the structural decline of manufacturing value added over GDP at the regional level. Individual cases such as Nigeria do not offset the general situation. Note that South Korea, an advanced economy, continues to increase its GDP share of manufacturing value added.

Figure 1: Evolution of the manufacturing activity in SSA (1981-2018)



Source: World Development Indicators.

Figure 2 highlights the fact that SSA countries are in the bottom ranks of the Global Competitiveness Index (GCI 4.0) and have, on average, low levels of regulatory effectiveness, compared to other regions, according to the annual Doing Business ranking produced by the World Bank. The GCI 4.0 identifies and assesses the factors that underpin the process of economic growth and human development. The ease of doing business score for regulatory efficiency is an aggregate score of the procedures, time and cost of starting a business, dealing with construction permits, and getting electricity, among others. The ease of doing business score for regulatory quality is an aggregate score to the ease of getting a credit and the protection of minority investors, among others. Along all of these indicators, African countries are at the bottom of the ranking.

Figure 2: The business climate in SSA (2018-2019)



Sources: Doing Business ranking and the World Economic Forum.

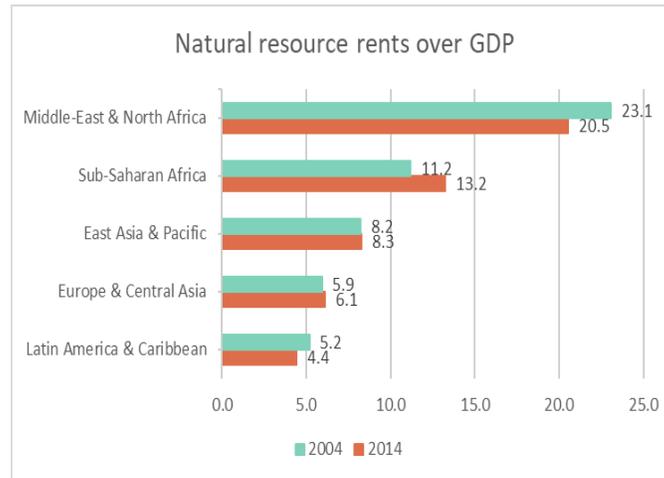
1.2 Natural resources in SSA

Africa is one of the most endowed and resource-dependent regions in the world. Since the last global commodity price boom (2004-2014), most SSA countries are now considered as resource-rich/resource-dependent countries⁴ (26 out of 48, see Appendix A) according to the IMF criteria (IMF, 2012; Venables, 2016), up from 15 countries in 2004. As confirmed by Figure 3, SSA is the only developing region whose natural resource intensity grew between 2004 and 2014.

In this paper, we explore the relationship between these two sets of facts—low competitiveness and high natural-resource dependence—in Africa.

⁴ To avoid confusion, we will refer exclusively to resource-dependent countries, i.e. countries with a significant endowment in natural resources and very dependent to it due to an insufficiently diversified economy (contrary to Canada, the U.K. or the U.S., for instance).

Figure 3: Natural resource intensity in SSA (2004-2014)



Source: World Development Indicators.

1.3 Theoretical channels

1.3.1 The traditional Dutch Disease

In his general survey on the natural-resource curse, Frankel (2010, p. 19) presents the “Dutch Disease” as one of the main mechanisms behind the sub-standard economic performance due to resource endowments, referring “to some possibly unpleasant side effects of booms in oil or other mineral and agricultural commodities”. Empirical work, such as that of Harding and Venables (2016) documents a loss of non-resource export earnings equal to 74 cents and 23 cents more imports for every additional dollar of resource revenue.

The Dutch disease theory developed by Corden and Neary (1982) refers to the economy’s response to a commodity boom, such as an increase in resource prices, and its deleterious impact on competitiveness of the tradable sectors of the economy. The commodity price shock leads to a booming resource sector, increasing exports as well as production. The increase in resource-related export value drives an appreciation of the real exchange rate.⁵ Meanwhile the pressure to increase production pushes up demand for inputs to the production process, such as labor and capital,

⁵ Under floating exchange rate, this takes the form of nominal currency appreciation. Under fixed exchange rate, it takes the form of money inflows and inflation.

increasing the prices of these factors. The nontradable sectors can expand and raises prices to account for increased costs they now face. On the other hand, tradable sectors, as price-takers cannot raise prices to compensate for higher costs. Instead, they become less competitive than their foreign rivals who do not face the same increase in factor input prices. This can lead to a contraction of the tradable sectors, such as manufacturing or commercial agriculture. This squeezing of the traded sectors can be detrimental to economic development as it can make the economy less diversified – and therefore more subject to risks from commodity price volatility- but also because the economy may miss out on productivity growth particularly associated with certain sectors like manufacturing exports.⁶ Some versions of the Dutch disease framework allow for additional mechanisms, such as the role of an expending public sector, driven by increased government revenues derived from the resource sector (Frankel, 2010).

1.3.2 Government expenditures and resource rents

Government size by itself is not an indication of development failure: Bergh and Henrekson (2011) note that government size is larger for industrialized states thanks to social insurance schemes. But a sudden jump in public spending consequent to a windfall of natural resource rents due to a commodity price boom can distort public sector outcomes; and amplify the impact of the Dutch Disease on tradable sectors, that is on the competitiveness of the economy. Further, given the way government receives this revenues – via a relatively small number of resource companies rather than taxation of citizens – accountability can be weakened and may distort incentives. This may manifest in a weakening of institutions and distorted regulatory practices that in turn may also negatively impact competitiveness.

In this paper we will explore this previously neglected public-sector channel – whereby a booming government may distort the institutional and regulatory environment. We propose that a deeper understanding of the role of the public sector in resource-rich economies can help explain the stylized facts of both lower export competitiveness, and weaker regulatory and institutional

⁶ Non-export-commodity traded sectors (especially the industry/manufacturing sector) are considered as economic sectors with the strongest learning by doing effects (Frankel, 2010). From a geopolitical perspective, these sectors of activity are the power seat and the resilience capacity of a nation state. To illustrate this last point, the United States: does not produce boats except military ships; the shipbuilding industry is entirely dominated by China, Japan and South Korea (Gourdon and Steidl, 2019). This fact is obviously linked to geopolitical trends indicating a refocusing of power from Western countries to China and South-east Asia.

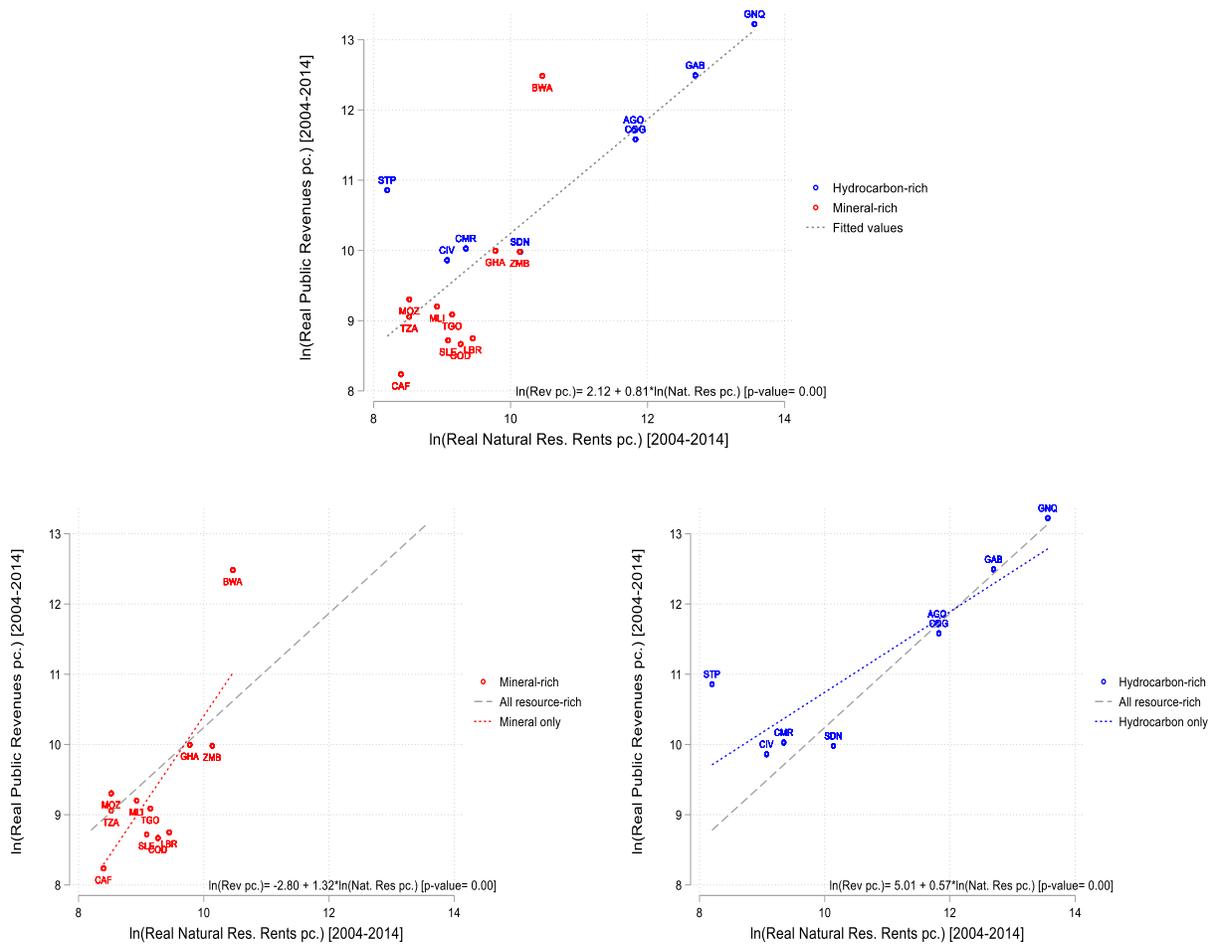
environment. This political economy effect can then further weaken the dynamism and success of the private sector, including export sectors.

Section 2. Empirical evidence from the recent resource boom

2.1 Resource windfalls and government revenue and expenditures

We focus exclusively on the 26 SSA resource-dependent countries during the commodity price boom of the period 2004-2014. Figure 4 shows the correlation between natural resource rents per capita and real public revenues per capita. We find a strong and statistically significant association between natural resource revenues and the size of the public sector. The correlation coefficient between resource rents and (total) revenue collected during that specific period is 0.81. As we use a log-log specification, the correlation coefficient can be interpreted as an elasticity: a 10 percent increase in resources rents per capita is associated with an 8.1 percent increase in public spending per capita. The correlation coefficient is stronger for mineral-dependent SSA countries (1.32) but that is mostly driven by Botswana, well known for having effectively managed its diamond wealth, compared to other mineral-dependent countries in SSA. The correlation coefficient for hydrocarbon-dependent SSA countries is 0.57.

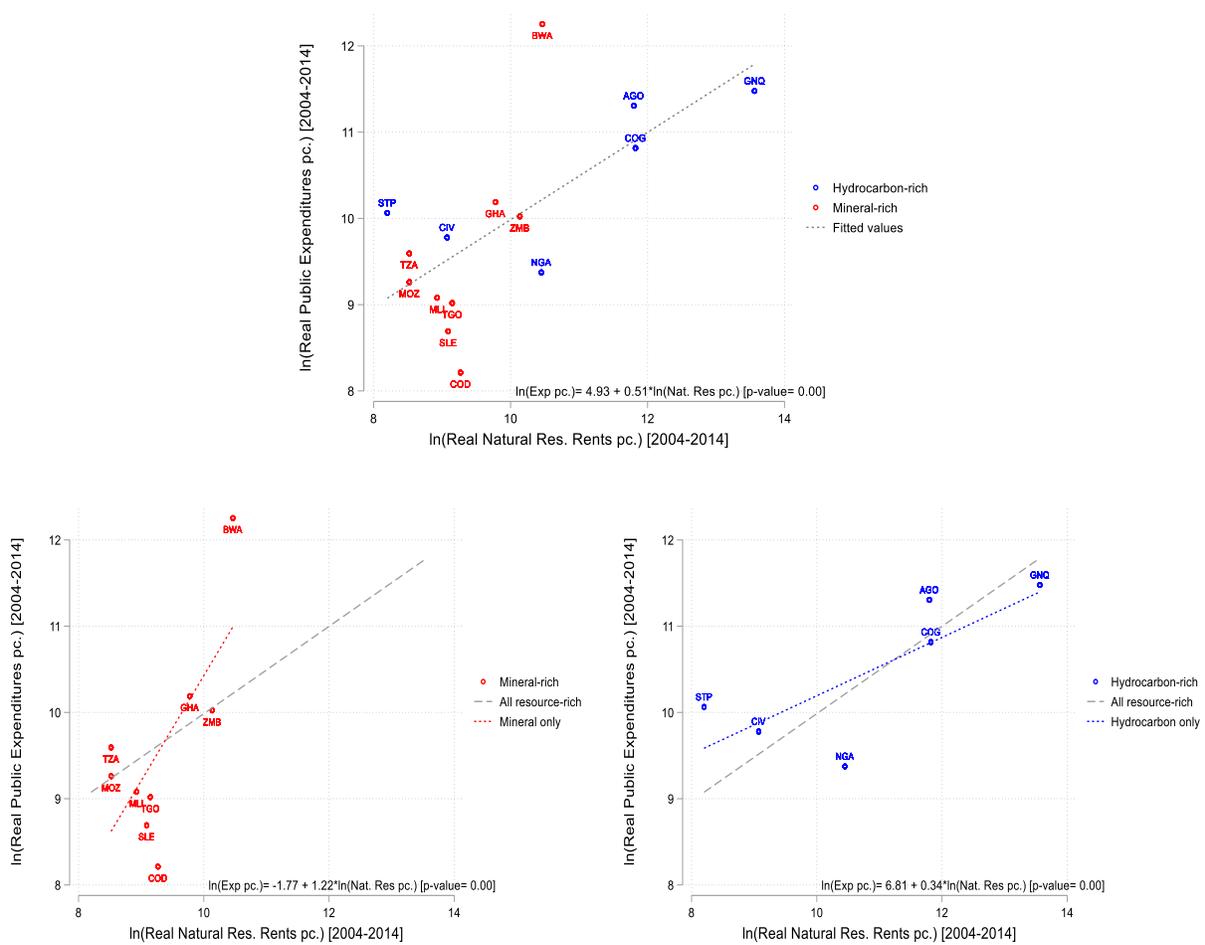
Figure 4: Natural resource rents per capita and real public revenue per capita for SSA resource-dependent countries (2004-2014)



Source: World Development Indicators.

Figure 5 displays the correlation between natural resource rents per capita and real public spending per capita, the outcome we focus on. The findings remain qualitatively the same as for revenues but the magnitude of coefficients is slightly smaller, as variations are less mechanical. The correlation coefficient between resource rents and (total) public spending during the period is 0.51: a 10 percent increase in resources rents per capita is associated with a 5.1 percent increase in public spending per capita. The correlation coefficient is stronger for mineral-dependent SSA countries (1.22) but this too is driven by Botswana providing relatively more state-financed public goods compared to other mineral-dependent countries in SSA. The correlation coefficient for hydrocarbon-dependent SSA countries is 0.34.

Figure 5: Natural resource rents per capita and real public spending per capita for SSA resource-dependent countries (2004-2014)



Source: World Development Indicators.

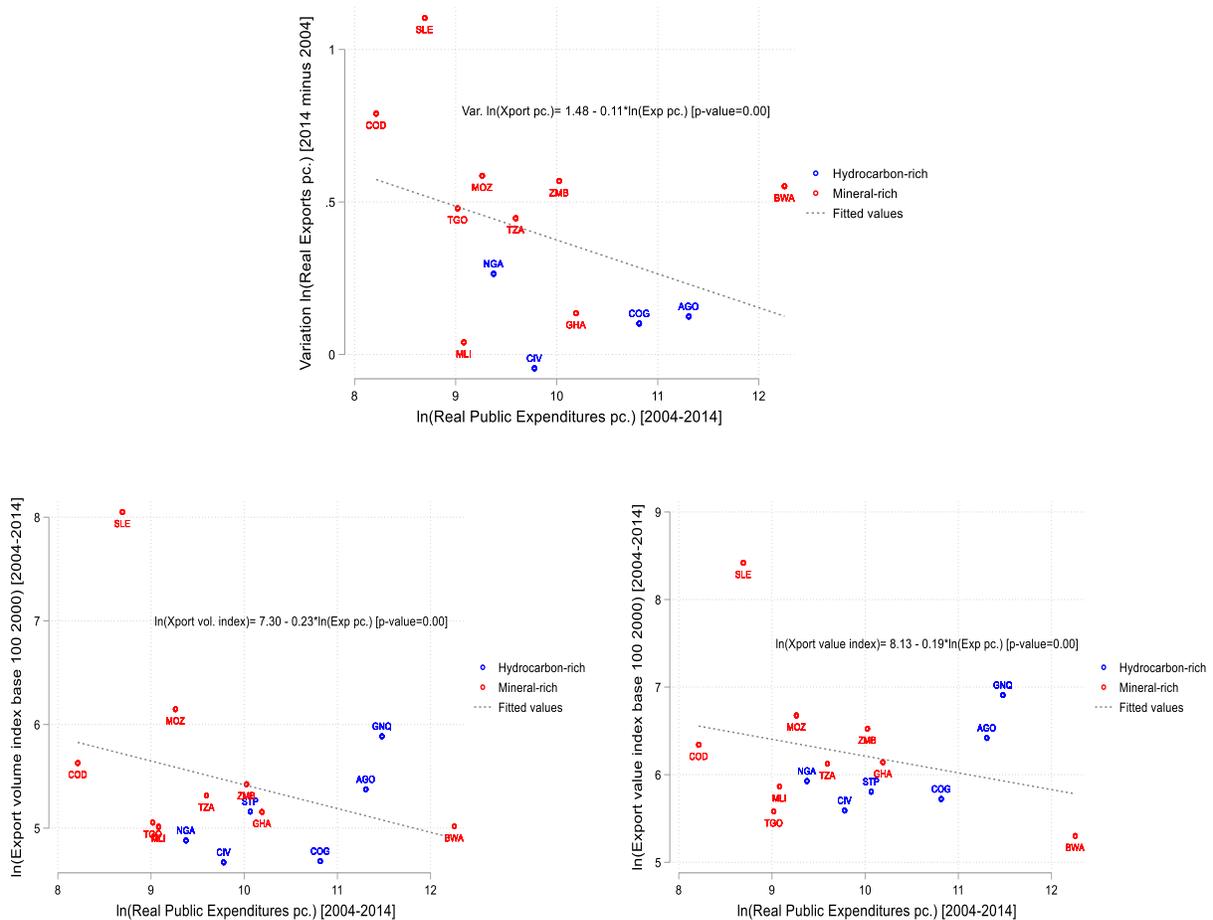
2.2 The boom in government spending and competitiveness

The boom in government spending, associated with the 2004-14 commodity price boom, has a negative and significant correlation with various measures of competitiveness.

In Figure 9 we provide evidence of a negative correlation between total spending per capita and exports between 2004-2014 and captured with three different methods. Again, we adopt log-log specifications so the coefficient can be interpreted as elasticities. First, we compute the difference in real exports per capita between 2014 and 2004. We find that an increase of 10 percent of total spending per capita is associated with a decrease by about 1.1 percent in the gap of real exports

per capita between 2004 and 2014. Second, we find that an increase of 10 percent of total spending per capita is associated with a decrease by about 2.3 percent of the export volume index (base 100 in 2000). Finally, we find that that an increase of 10 percent of total spending per capita is associated with a decrease by about 1.9 percent of the export value index (base 100 in 2000).

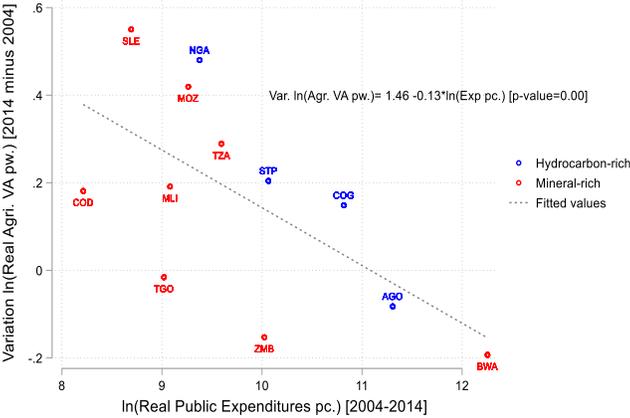
Figure 9: Total public spending per capita and exports in SSA resource-dependent countries (2004-2014)



Sources: World Development Indicators.

Figure 10 displays a negative correlation between total spending per capita and agricultural sector activity. We compute the latter as the change in real agricultural value added per worker in 2014 minus 2004. We retain a log-log specification to obtain an elasticity. We find that a 10 percent increase in total spending per capita is associated with a decrease by about 1.3 percent of the change in real agricultural value added per worker between 2004 and 2014. The change in agricultural output is in fact negative for Angola, Botswana, Togo and Zambia (4 out of 12 countries for which we have data).

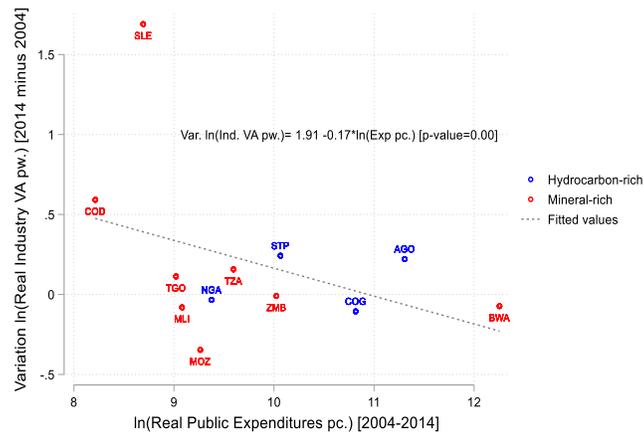
Figure 10: Total public spending per capita and agricultural value-added per worker (2004-2014)



Sources: World Development Indicators.

Figure 11 highlights a negative correlation between total spending per capita and the industrial sector. We compute it as the variation of real industrial value added per worker in 2014 minus 2004. We retain a log-log specification to obtain an elasticity. We find that a 10 percent increase in total spending per capita is associated with a decrease by about 1.7 percent the gap of real industrial value added per worker between 2004 and 2014. The variation of industrial output is furthermore negative for Botswana, Congo Republic, Mali, Mozambique, Nigeria and Zambia (6 out of 12 countries for which we have data).

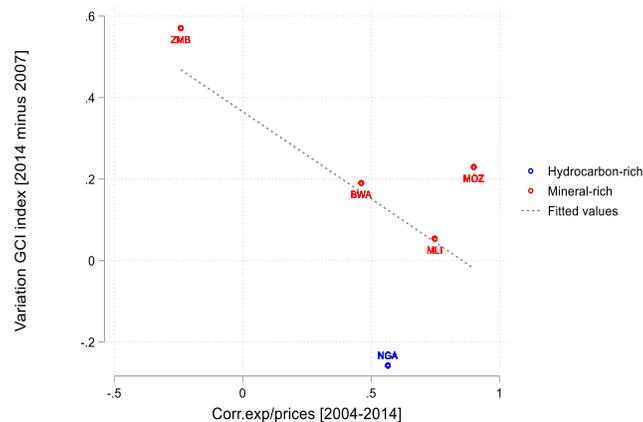
Figure 11: Total public spending per capita and industrial value-added per worker (2004-2014)



Sources: World Development Indicators.

In addition, we find that the correlation coefficient between commodity prices in 2004-2014 and the quality of institutions as captured by the GCI (see Figure 12) is negative. This suggests that the spending boom associated with high commodity prices leads to a deterioration of institutional quality that, in turn, lowers competitiveness.

Figure 12: The correlation coefficient between spending and commodity prices is negatively associated with the GCI (2004-2014)



Sources: World Bank Commodity Markets, World Development Indicators and the World Economic Forum.

2.3 Resource booms and the composition of public spending

To understand why there is this strong, negative correlation between public spending and competitiveness, we need to look more closely at the composition of the spending. We observe a positive correlation between natural resource rents and the share of public investment in total spending during the boom period (see Figure 6). This is not surprising, as the 2004-2014 period corresponded to a heightened focus among developing countries and development partners on closing the infrastructure gap worldwide.⁷ A higher fraction of government spending on capital goods – like infrastructure - is recommended for the purposes of promoting long-run sustainable development (Spence, 2008). This is also reflected in Hartwick's Rule (Hartwick, 1977), which states that, since resource extraction involves depleting a stock of natural wealth, for countries to not become poorer overall, they need to reinvest the rents from the depletion in other stocks of assets, such as productive capital.

However, the benefits of investing resource revenues in infrastructure are not given, but depend on the choice of project, the cost and efficiency of construction, and the policy and regulatory framework in which the project operates. There is some evidence that resource-rich countries have lower returns on their public investments. Gelb (1988) documents six oil-exporting countries (including Nigeria) that invested a sizeable portion of the windfalls from the 1973-74 boom, only to see their overall growth rates return to pre-1973 levels in a few years. Albino-War et al. (2014) look at public investment efficiency among Middle East and Central Asian oil exporters and find that they lag behind the better performing developing countries on all three of their measures of efficiency. Barhoumi et al. (2018) show that Sub-Saharan Africa has lower public-investment efficiency than other regions and, within SSA, the oil-exporting countries have the lowest efficiency. Devarajan and Singh (2012) illustrate this point with the following examples from three Central-African oil exporters:

⁷ This is reflected in various development policy discussion from this time, such as various UN high level forums: <https://developmentfinance.un.org/closing-the-infrastructure-gap>.

Chad

- Highest cost of classroom construction in Africa (four times next most expensive country)
- Leakage rate for nonwage health spending: 99 percent

Cameroon

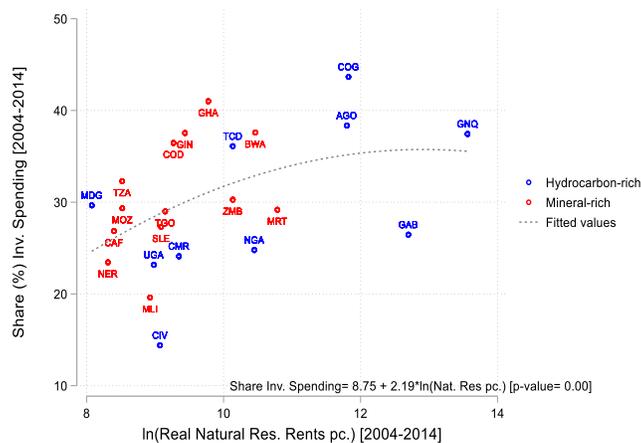
- Spends \$50 per capita on health, with epidemiological profile of countries that spend \$10
- Road maintenance costs are double the African average
- Three-quarters of contracts circumvent procurement system

Congo, Republic

- 47 percent transmission losses in electricity (African average: 27 percent)

Finally, Warner (2014) shows that public investment “booms”, which usually follow commodity price booms, have negligible growth effects one year after the investment.

Figure 6: Natural resource rents per capita and the share of public investment spending for SSA resource-dependent countries (2004-2014)

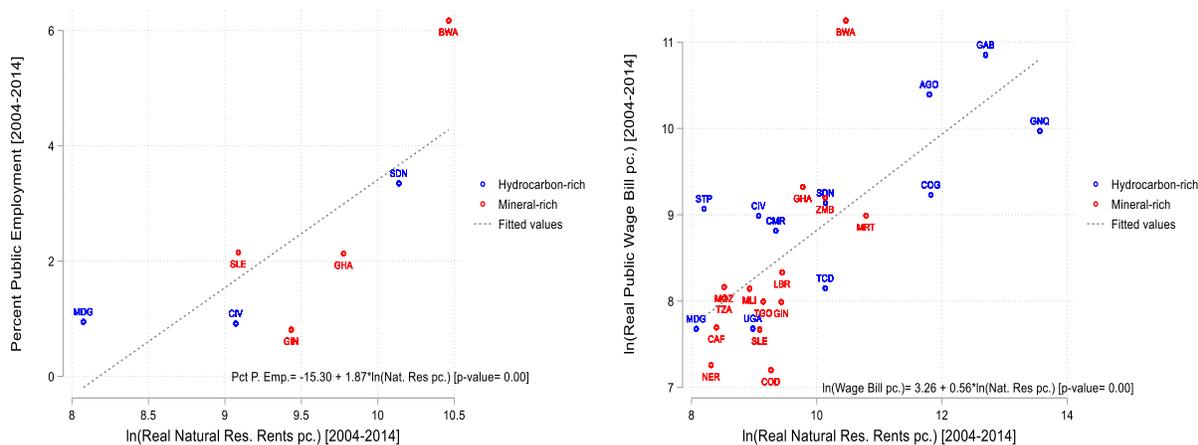


Source: World Development Indicators.

As for current government consumption, we also observe, during the price windfall period, a positive correlation between natural resource rents and i) the percent of public employment; and

ii) the public wage bill (See Figure 7). These findings are in line with general results from the literature: globally, natural resource windfalls are associated with higher government employment (Stefanski 2015).

Figure 7: Natural resource rents per capita, public employment and public wage bill for SSA resource-dependent countries (2004-2014)

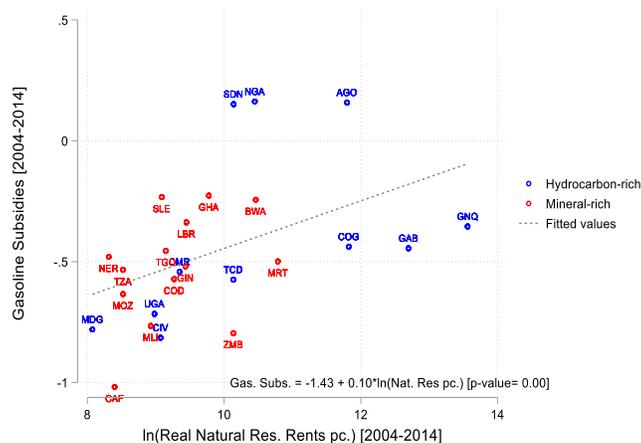


Source: World Development Indicators.

This surge in public employment affects competitiveness by bidding up private-sector wages, making it difficult for the private sector to compete in international markets (Behar and Mok 2013). The extreme version of this phenomenon is observed in Kuwait, where public-sector salaries are so high that the only people working in the private sector are foreigners.

Finally, we observe, during the same period, a positive correlation between natural resource rents and gasoline subsidies (or a lower level of gasoline taxes, see Figure 8). To the extent that these subsidies distort production and consumption choices, they undermine competitiveness. For instance, the traffic congestion caused by subsidized gasoline in Cairo, Egypt costs the Egyptian economy 0.6 percent of GDP every year (Devarajan et al. 2014).

Figure 8: Natural resource rents per capita and gasoline subsidies for SSA resource-dependent countries (2004-2014)



Sources: Ross, Hazlett Mahdavi data and World Development Indicators.

Section 3. Interpretation and a proposed solution

Why does the spending boom associated with higher commodity prices lead to lower competitiveness? After all, inasmuch as African governments are seeking to increase their competitiveness, they should be able to use the windfall to further this goal. We suggest that the reason is that resource revenues are fundamentally different from other types of government income. Resource revenues go directly to the government without passing through the hands of the citizens. In this sense, they are different from tax revenues, which by definition are paid by citizens. This distinction has at least two implications for resource-intensive economies. First, citizens may not know the extent of resource revenues. In the late 1980s, Cameroon’s oil revenues were a closely guarded secret—so much so that even parts of the government, such as the Ministry of Planning, did not have access to this information. Secondly, and more fundamentally, citizens may not have as much of an incentive to scrutinize how government spends resource revenues. They often do not view it as “their” money (even though it is). As a result, the government is not held as accountable for the use of revenues as it would be if the revenues came from taxation. Not surprisingly, therefore, public spending is often misallocated, wasted, or simply stolen. And the economy’s competitiveness suffers.

The question is what can be done about this problem? One solution would be for government to transfer oil revenues to the citizens and then tax them to finance public expenditures. Devarajan (2019) provides two pieces of evidence supporting this proposal. First, building on Devarajan et al. (2013), he shows using a game-theoretic model that this transfer-cum-tax scheme could lead to an improvement in public-spending outcomes. The intuition is as follows: citizens face a tradeoff between spending money on private goods and on scrutinizing public expenditures which, if effective, could lead to more public goods. If citizens are uncertain about the extent of public revenues, they are less likely to invest in scrutinizing public spending because the benefits are uncertain. The proposed transfer-cum-tax scheme reduces this uncertainty. Now the citizens have a better idea of the size of government revenues (because they received the transfers and know the taxes they paid). This increases the benefits from scrutiny, leading to greater scrutiny and therefore more public goods.

The second piece of evidence is empirical. Using a panel of about 120 countries over 15 years, Devarajan (2019) shows that there is a positive and statistically significant relationship between tax revenues and accountability; and a negative and statistically significant relationship between oil rents and accountability. He further shows that the measure of accountability used (“voice and accountability” in the Worldwide Governance Indicators) is positively and significantly associated with measures of public-spending outcomes, such as secondary enrollment.

In sum, African countries may be able to mitigate the harmful effects of natural resource revenues on competitiveness by transferring the revenues directly to citizens and taxing them to finance public expenditures. The increased reliance on taxation will make resource-rich governments more accountable that, in turn, will lead to more effective public spending and hence greater competitiveness.

Section 4. Problems with the solution

To be sure, there are many potential challenges to the proposed solution of transferring revenues and taxing citizens. We discuss three of them and suggest possible responses.

The first challenge is that such a transfer-cum-tax scheme may not be feasible, especially in low-income African countries with a dispersed rural population. How can these people be reached to

provide them with the transfer, not to mention extract taxes from them? While this would have been a serious obstacle to implementing the scheme ten years ago, it is no longer problem. Thanks to modern technology, it is possible to equip every citizen with a bank card that can both receive and disburse money electronically. Gelb and Decker (2012) show that the cost of these cards is of the order of \$1 per card. The fact that India has been able to issue these cards to each of its 1.3 billion citizens means that it should be possible in every African country. Moreover, a second technological development makes it possible to use these cards even in remote locations: mobile banking. Popularized in Kenya with MPesa, mobile banking has enabled hundreds of millions of people to undertake financial transactions with their cell phone. Given the high and rising cell phone penetration in most of Africa, it should be possible to use mobile banking to implement the transfer-cum-tax scheme for resource revenues in these countries.

A second concern is that, when they receive cash transfers, people will spend it on alcohol, tobacco and other “temptation goods”, and possibly stop working. While this is a reasonable concern in theory, it is not supported by the empirical evidence. In a review of 19 cash transfer programs, Evans and Popova (2017) find no evidence of increased spending on temptation goods such as alcohol and tobacco. Haushofer and Shapiro (2017) show in randomized control trials in Kenya and Liberia that recipients spent the additional income on investments in their house or business. As for whether people will stop working, a study of the Alaska Permanent Fund, the longest-running transfer scheme, reveals that the program had no negative effects on employment and increased effort in part-time jobs (Jones and Marinescu 2018).

Perhaps the most compelling criticism of the proposal is the politics. Why would a government agree to a scheme that makes it more accountable to the public? Powerful people who benefit from the diversion of resource revenues would object to the proposal. While this would appear to be a major stumbling block, Do and Devarajan (2020) show that there are cases where even a corrupt government may adopt the proposed transfer-cum-tax scheme. One case would be if the government wants to undertake a very large project, such as building a new capital city, that requires more resources than it has. The government would like to attract investors for the project. But given the government’s reputation for corruption, investors may be reluctant because they will lose their money if the project is declared a failure, even if the reason for the failure is that the money was stolen. Now, suppose investors can obtain information about the project’s success but

at a cost. Suppose further that this cost is so high that it is still not in the investors' interest to purchase the information and, based on the outcome, take a decision on the project.

To get around this problem, the government could transfer resources to the citizens and invite them to contribute to the project's financing, with the following conditions. If the project is successful, then the citizens receive a return on their investment but the government can collect the original transfer back as taxes. If the project is unsuccessful, the citizens keep the transfer but receive no return on the investment. Do and Devarajan show that, for a large enough transfer, citizens will now find it in their interest to pay the costs of obtaining information, and if the information is favorable, invest in the project. Furthermore, foreign investors, if they observe the citizens of the country investing in the project, will know that the information is favorable, and would then invest themselves. In short, the transfer here works as a way of reducing citizens' risk in investing in the project, by making the tax element "conditional" on a successful project. Inasmuch as resource-rich governments often have large projects in their plans, such situations are likely to exist in many countries, making the likelihood that they will adopt the proposed transfer-and-tax scheme higher. Of course, a government that is genuinely interested in improving the welfare of its population, but is constrained by corrupt elements within the administration, may also consider adopting this scheme.

Section 5. Conclusions

Noting that there is an inverse relationship between Africa's competitiveness and natural resource rents, particularly during the commodity price boom of 2004-14, this paper has examined a reason for this relationship that is different from the standard "Dutch disease" mechanism. We showed that an increase in natural resource rents is associated with a sizeable increase in government revenues and expenditures. The way in which governments use these additional expenditures undermines competitiveness. Public investment is often misallocated, highly costly, and unproductive; the boom in public employment makes it difficult for the private sector to compete; furthermore, public spending in health and education may be ineffective; and subsidies on fuel distort incentives and, through the effects on traffic congestion, pollution, etc. could harm exports.

We suggested that the reason for these unfavorable outcomes is that resource revenues are different from other sources, such as taxation, in that governments are not as accountable to citizens for

expenditures from resource revenues. Governments that rely more on taxation than resource rents for revenue have better public-expenditure outcomes. To alleviate the problem, we proposed that governments transfer resource revenues directly to citizens and tax them to finance public spending. We showed analytically and empirically that such a scheme could improve public-spending outcomes in resource-rich countries. Finally, we explored some obstacles to the implementation of this scheme and showed that there were ways of overcoming each of them.

Africa's low and declining competitiveness has long been a source of concern. By focusing on the role that natural resources play in influencing public-expenditure decisions, we have suggested a possible way of reversing the trend and helping the continent accelerate growth and poverty reduction. We need to turn the resource curse into a blessing.

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Appendix

A. The list of 26 SSA resource-dependent countries

Country Name	Country Name
Angola	Madagascar
Botswana	Mali
Cameroon	Mauritania
Central African Republic	Mozambique
Chad	Niger
Congo, Dem. Rep.	Nigeria
Congo, Rep.	Sao Tome and Principe
Cote d'Ivoire	Sierra Leone
Equatorial Guinea	Sudan
Gabon	Tanzania
Ghana	Togo
Guinea	Uganda
Liberia	Zambia

