Managing Resource Revenues in Developing Economies

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Abstract

This paper addresses the efficient management of natural resource revenues in capital-scarce developing economies. It departs from usual prescriptions based on the permanent income hypothesis and argues that capital-scarce countries should prioritize domestic investment. Because revenue streams are highly volatile, governments should protect consumption from shocks by increasing it only cautiously. Volatility in domestic investment can be moderated by a buffer of international liquidity, but it is also important to structure investment processes to be able to cope efficiently with substantial fluctuations. To date, most of the resource-rich countries of Africa have not had investment rates commensurate with their rate of resource extraction.

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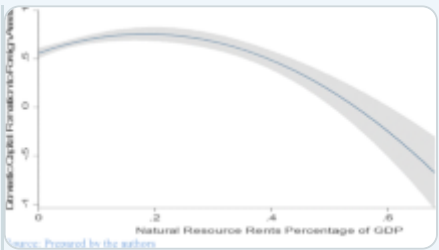

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Notes

1. Democracy and resource rents also appear to interact badly (Collier and Hoeffler, 2009). Democracies with no natural resource rents tend to grow more rapidly than autocracies, resource-rich democracies grow more slowly than autocracies. The degree of electoral competition determines the process by which a government acquires power, whereas the number of checks and balances determine the limits on how it can use power. Electoral competition damages the democratic process, whereas checks and balances are beneficial. The evidence suggests that resource rents gradually weaken checks and balances. The governance challenge for resource-rich Africa may thus be to strengthen checks and balances in the face of pressures to weaken them.

2. According to this view, the only reason for it to be positive at all is the probability of human extinction and that future generations will not exist. These arguments have been re-evaluated in the context of climate change (Stern, 2006). An additional argument for using a low discount rate is that there is a probability that future generations may be much poorer than us (Weitzman, 2007).

3. Notice that the permanent income hypothesis holds true economic wealth (that is, resource wealth under the ground plus financial assets) constant at all

dates from discovery onwards. Thus, borrowing in the early years equals the increase in the present value of resource revenue which is occurring as the windfall revenue becomes less far distant.

4. An implication of this result is sometimes known as the Hartwick (1977) rule. Saving the whole of the revenue from a depletable asset will (if there is no population growth or technical change) results in a constant path of consumption, that is, intertemporal egalitarianism.

5. And if $r^D = r^*$ we return to the world of the permanent income hypothesis.

6. Only if the resource discovery is very large will it also be optimal to build up a permanent savings fund which will be smaller than under the permanent income hypothesis.

7. This section draws on Commission on Growth Development (2008).

8. For this calculation, we ignore the contribution to private sector investment from foreign sources. Foreign direct investment would be one category.

9. Note that the taxonomy links the discussion of resource revenue to that on scaling up aid (Gupta, Powell, and Yang, 2006). In IMF terminology a foreign exchange windfall is 100 percent "absorbed" if it is matched one-for-one by an increase in the nonwindfall current account deficit. Thus, cases 1 and 2 are 100 percent absorbed, case (iii) $1–(1-\gamma)(1-z)$ absorbed, and case 4 zero percent absorbed. A windfall is 100 percent 'spent' if it is matched one-for-one with the nonwindfall fiscal deficit. Thus, alternatives 1 and 2 are 100 percent spent, while alternatives 3 and 4 are 0 percent "spent." Each of these alternatives has wider implications for the economy as a whole.

10. Note that rent grabbing as a result of higher commodity prices is especially

true for capital-intensive mineral sectors such as oil, gas or diamonds, but not so for labor-intensive resource sectors such as coffee, rice or banana where the higher prices lead to higher wages and more productive activity (cf. Bó and Bó, 2009).

11. They let the welfare loss of public spending be given by a quadratic, so that marginal benefit of spending declines and beyond a certain level (say, 40 percent of nonoil GDP) becomes negative.

12. If the interest rate and rate of time preferences are zero and the utility function displays constant absolute risk aversion, then a back of the envelope calculation shows that the optimal share of windfall revenue to save is $\varepsilon\upsilon^2/2$, where ε is the coefficient of relative risk aversion and υ the coefficient of variation of oil prices. The 95 percent confidence interval for the predicted oil prices of Hamilton (2008) suggest mean oil price of $137 per barrel and a standard deviation of $37.5, so that υ=0.27 over a one-year period. Given that a reasonable range for ε is 1−2, it is optimal to save between 3.75 and 7.5 percent of the windfall. If the windfall is expected to last much longer than a year, oil prices are much more unpredictable as the coefficient of variation increases with the square root of the length of the forecast period, so it is optimal to have a larger share of the windfall as a precautionary buffer. In an intertemporal context, the size of the precautionary buffers will have to be larger the more persistent shocks to commodity prices are; furthermore prudence requires that oil depletion becomes much more aggressive, especially if the country has substantial monopoly power on international resource markets and attaches high priority to boosting public spending, thus departing from the usual Hotelling rule (Ploeg, 2009).

13. The IMF has amended its standard permanent income guidelines for the nonhydrocarbon primary deficit of oil/gas-producing countries to allow for habit persistence in public spending on final goods. This has been applied to calculate fiscal benchmarks for Gabon (Leigh and Olters, 2006) and, more generally, for sub-Saharan African oil/gas-producing countries (Olters, 2007).

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Additional information

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