Public Investment in Resource Abundant Low-Income Countries (LICs)

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Motivation

Natural resources are a source of fiscal revenue in many LICs.
With more discoveries likely, it will become increasingly important.

Managing resource windfalls poses challenges for policymakers.

- ▶ Conventional wisdom based on the permanent income hypothesis (PIH) prescribes saving the windfall in a sovereign wealth fund (SWF).
- ▶ LICs are capital scarce. High returns to domestic capital. Potentially large benefits from building infrastructure.

Should LICs save in SWFs or invest in infrastructure?

- ▶ History is not very supportive of the view that higher public investment will promote sustained growth. Stability concerns.

In this paper

We study the macroeconomic effects of alternative policy responses to a large but temporary resource windfall.

We develop a dynamic stochastic general equilibrium (DSGE) model suitable for policy analysis in LICs. Key features:

- ▶ Public capital (high marginal product of capital),
- ▶ Historical (in)efficiency in the production of public capital,
- ▶ Absorptive capacity constraints,
- ▶ Learning by doing,
- ▶ Detailed commodity and fiscal sectors.
    - ▶ Limited ability to raise non–resource revenue.

Emphasis on simple fiscal rules.

Policy Response 1: "Saving in a SWF"

▶ A constant share of the windfall is put aside each period in the SWF.

▶ The annuity income from SWF supports permanently higher private consumption (through government transfers)

▶ The response is consistent with the PIH.

▶ Resource wealth is preserved but it does not contribute to economic development (no capital deepening).

▶ Most resource revenue does not flow into the domestic economy.

▶ Macro dynamics are minimal.

Policy Response 2: "Investing in Public Capital"

- ▶ The government spends the windfall on public investment as it accrues.
- ▶ Fast growth initially but traded goods production shrinks and productivity falls somewhat (Dutch Disease).
- ▶ Effectiveness of public investment is low if scaling up is too quick (absorptive capacity constraints).
- ▶ In the absence of additional non-resource revenue—to finance recurrent costs—the new public capital cannot be sustained (no capital deepening in the long run).
- ▶ Given volatile commodity prices, this approach also implies volatile fiscal policy.

Other factors—aside from the potentially high returns to domestic capital—matter.

Policy Response 3: "The sustainable investing approach"

- ▶ A gradual scaling up of investment;
- ▶ Minimizes instability, reduces absorptive capacity constraint costs and mitigates Dutch Disease;
- ▶ Preserves resource wealth in the form of higher public capital (consistent with the PIH).

The approach combines elements of domestic investment and external savings:

- ▶ Gradual increase in investment $\rightarrow$ Non–invested resource revenue plus any increase in other tax revenues goes to an "**investment fund**".
- ▶ Interest revenue from the fund finances recurrent costs.
- ▶ The scale of the investment program matters.

Related Literature

Our analysis complements recent papers on the optimal policy responses to a resource windfall (van der Ploeg (2011), Cherif and Hasanov (2012), Araujo et al (2012).)

Differences:

- ▶ We focus on simple rules in a fully specified DSGE, which may appeal to policymakers.
- ▶ Optimal policy analysis requires relatively simple frameworks to make the central planner's problem tractable.

The policy implications from this research is consistent with our formulation of the "sustainable investing approach."

The Model

Households

▶ Households choose a consumption basket and supply labor.

Firms

▶ Three sectors: traded, non-traded and natural resources.

▶ Production in the first two sectors depends on public capital K^G:

$$y_t^i = z^i \left(k_{t-1}^i \right)^{1-\alpha^i} \left(l_t^i \right)^{\alpha^i} \left(K_{t-1}^G \right)^{\alpha^G} i = T, N. \qquad (1)$$

▶ Learning by doing in the traded sector.

The natural resource sector

▶ Capital intensive, externally financed.

▶ A resource windfall is caused by an increase in FDI.

▶ The international commodity price is volatile.

The Model(2)

**The Government**

- ► Collects taxes on consumption and labor income, royalties on resource extraction and a share of the dividends.
- ► Can accumulate savings in external funds but cannot borrow internationally.
- ► Spends on transfers, government consumption and investment.
- ► Effective public investment $(\tilde{G}_t^I) \neq$ investment spending G_t^I:

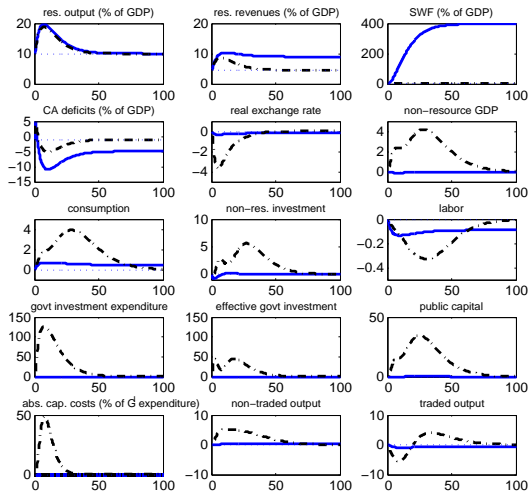$$\tilde{G}_t^I = \left[1 - b\left(\frac{G_t^I}{G^I} - 1\right)^2\right] G_t^I, \quad b \geq 0, \qquad (2)$$

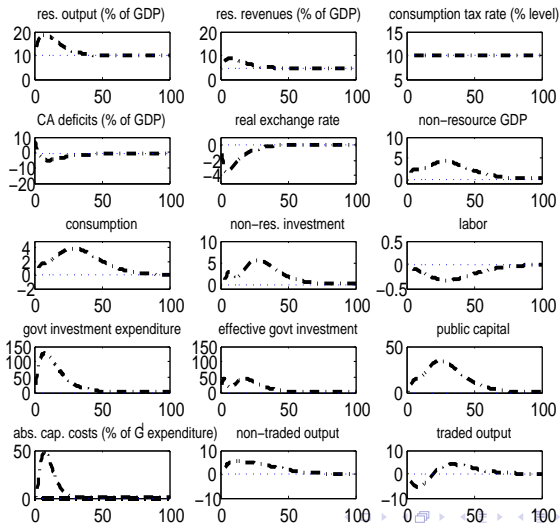b measures absorptive capacity constraints.

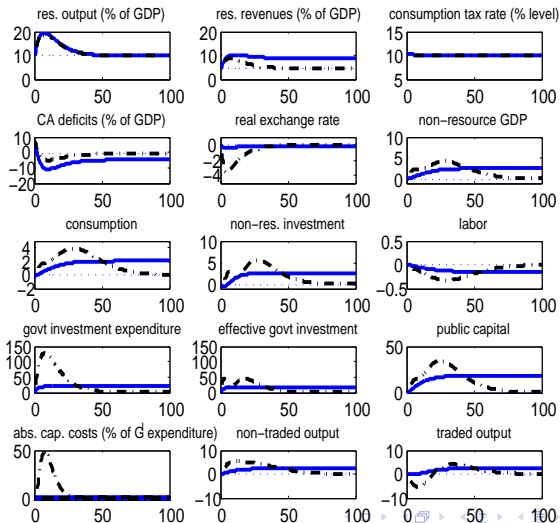# Results: SWF (solid) vs. Stylized Investment(dashed)
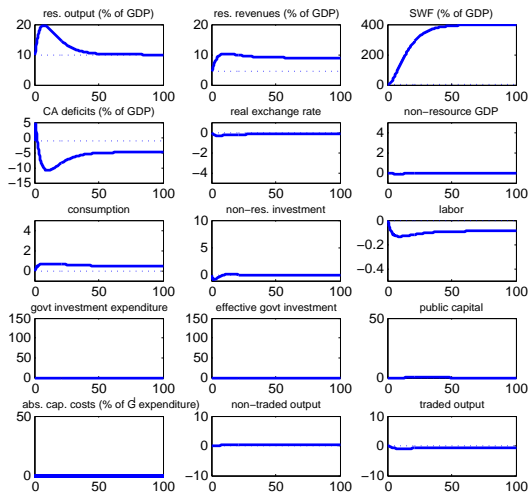
Results: SWF (solid) vs. Stylized Investment(dashed)

Results: Stylized(dashed) vs. Sustainable Investment(solid)

Results: Stylized(dashed) vs. Sustainable Investment(solid)

Conclusion

Natural resources provide an opportunity to speed up economic development.

This paper studies different policy responses to a resource windfall.

While investing in public capital can increase welfare, it exposes the country to absorptive capacity constraints, Dutch disease and stability concerns.

Difficulties in financing recurrent costs may undermine the sustainability of a higher capital stock.

A gradual investing approach can mitigate these concerns and help sustain the capital deepening.