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# Managing the Coming Resource Boom: Risks and Opportunities



**Confederação das Associações Económicas de Moçambique**

Por um Melhor Ambiente de Negócios!

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# Natural Resource Wealth and Economic Performance





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## Three Transmission Channels Through which Abundant Resources Can Lead to Poor Economic Performance

- **Volatility**
- **Dutch Disease**
- **Public Institutions**



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## Resource Booms and Volatility

- World commodity prices extremely volatile; production often subject to technical problems and demand swings
- LNG contract terms have changed, since early 2000s, from being long-duration to shorter-duration; also now more spot-market sales (So effect of contracts in dampening volatility in LNG revenues has weakened)
- Countries with large share of resources in GDP can therefore suffer large swings in revenues from external shocks in prices and production
- High volatility in revenues (boom and bust cycles) harmful to economic growth (particularly in tradable sectors and in countries where financial markets less developed – more difficult for firms to hedge)



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## Why Is Volatility a Problem for Competitiveness and Growth?

- Volatility increases uncertainty, reducing domestic and foreign investment
- Cyclical shifts of resources (labor, land, equipment) back and forth across economic activities incur costs (particularly transaction costs)
- Frictional unemployment and incomplete utilization of capital raise costs and reduce productivity
- Volatility in revenues in developing countries can lead to macroeconomic and political instability:
  - Fiscal policy tends to be pro-cyclical : Higher spending in booms and lower in busts
  - Booms can weaken government decision-making (i.e. encourage wasteful investment, increases in government employment) and increase demands for public sector wage increases. In busts, difficult to reduce these increases in employment and spending
- Pro-cyclical private capital inflows rise and fall as speculators move capital into (and out of) local assets, increasing volatility



## Resource Booms and Dutch Disease

### Major effects of boom on economy:

1. With floating exchange rate, large inflows of forex revenues (exports and FDI) cause nominal appreciation of exchange rate, when converted into Meticals, resulting in appreciation of real exchange rate (*real appreciation can be greater than nominal appreciation in some situations*)
2. Windfall revenues cause huge upsurge in domestic private and public spending (from firm profits, worker incomes, government profit shares, tax, and royalty receipts). If some spending goes to buying imports, appreciation of Metical is moderated as imports involve outflow of funds.
3. Spending effect drives up domestic prices of non-tradables (construction, services, transport) versus tradable goods (plus import-competing) in manuf., agric., and tourism (non-tradables prices set on domestic market; traded goods prices set on world markets). *Higher than “normal” non-tradable price rises can trigger added real exchange rate appreciation.*
4. End result, boom has two impacts on economy: an **expansion effect**, as domestic spending increases prices and outputs of non-tradables, and a **contraction effect**, as real exchange rate appreciation reduces profitability and output in non-resource tradables – the “Dutch Disease” effect)



## Negative Effects of Dutch Disease on Economy

- **Adverse impact on competitiveness**
  - Real exchange rate appreciation reduces competitiveness of non-resource tradables in manuf., agriculture, and services like tourism (In Mozambique, a modern manufacturing sector may simply not emerge)
- **Adverse impact on future growth**
  - Non-resource tradables are “special” – crucial for “learning-by-doing,” innovation, and structural change in economy
  - Decline of these tradables therefore bad for future productivity growth
  - Decline of these tradables also bad for future employment and poverty reduction
- **Welfare effects in the economy (winners and losers)**
  - Firms and workers in booming sector gain (higher profits and incomes)
  - Government benefits from higher profit share, taxes, and royalties
  - Producers of non-tradable goods and services gain
  - Primary losers will be producers of non-resource tradables (including import-competing activities) and workers in these sectors



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## Resource Booms and Public Institutions

- Natural resource booms influence quality of institutions and, in turn, economic growth
  - Booming revenues can worsen governance, resulting in corruption and policy mismanagement, undermining growth
- On the other hand, pre-boom quality of institutions (i.e., quality of governance) can influence effect of boom on economy
  - Countries with strong institutions at start of boom are shown to do much better, turning possible resource curse into a blessing
- Research finds “Point-source resources” (oil, gas, minerals, diamonds) have biggest negative effects on public institutions because of central command of resource revenues by government



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## How Vulnerable Is Mozambique to the Negative Effects of a Resource Boom?

Vulnerability depends importantly on:

- Size of the boom/GDP; size of boom fiscal revenues/total fiscal revenues
- Quality of public institutions for financial and investment management (e.g., ability to manage volatility; ability to plan and implement increasingly large public investment projects)
- Quality of monetary policy management and sensitivity of the real exchange rate to external shocks in commodity prices and demand
- Absorptive capacity constraints of economy for public investment : Will higher fiscal spending increase inflation (prices of non-tradables) and drive up the real exchange rate?



## Boom-Related Vulnerabilities: Size of the Boom

- Mozambique's economy small (GDP 2013 \$16bn; \$600 per capita); so potential for even moderate resource boom to have large economic impact
- Estimates: next 10 years Mozambique one of the top 5 exporters of coal in world and in next 20 years world's 3<sup>rd</sup> largest LNG exporter
- Consensus estimates of fiscal revenues from boom (90% from gas, 10% from coal)
  - Gas begins 2020; assuming 6 trains, revenues increase steadily from about \$2bn in 2023, \$5bn in 2026, to peak of \$8bn-\$9bn per year by mid 2030s (so multi-billion \$ revenues unlikely before mid-2020s)
  - Including coal, peak fiscal revenues could be \$10bn per year by early 2030s
  - By 2045 (with no new discoveries) gas output begins decline until estimated low around 2055
  - Over 2020-2045 life of gas project total fiscal take around \$212bn
- Impact of boom on government fiscal revenue and GDP:
  - By mid 2030s, gas and coal revenues could reach 40%-50% of fiscal revenue and 15 to 20% of non-resource GDP



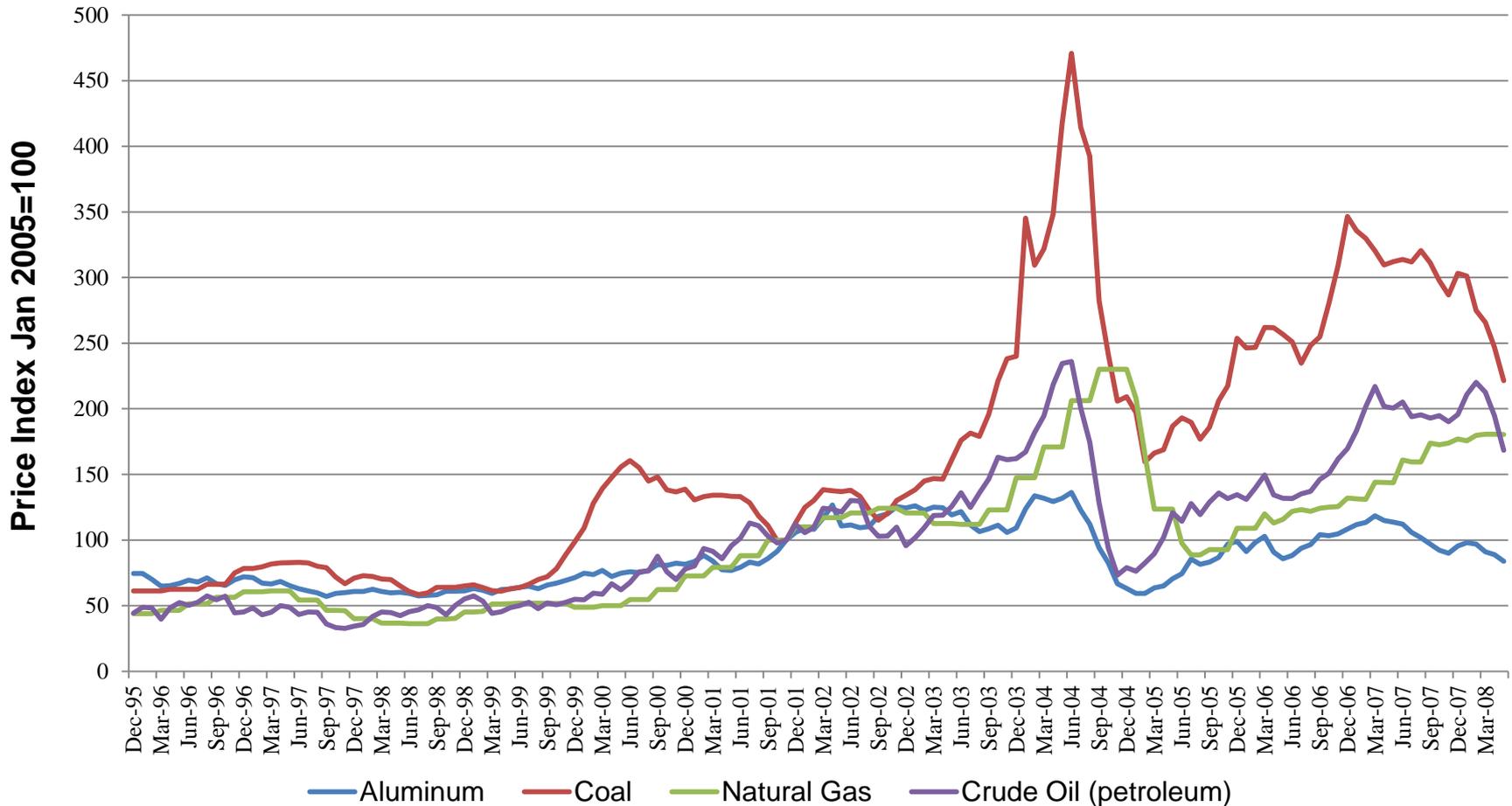
## Boom-Related Vulnerabilities: Volatility

- Mozambique will be highly vulnerable to external commodity price and demand shocks
  - Production and total exports concentrated in commodities with volatile prices – gas and coal, but also agricultural commodities, heavy sands, and aluminum **(see next slide)**
  - More than 50% fiscal revenues will come from commodity exports
  - Fiscal policy shows signs of pro-cyclically, which is likely to amplify price volatility (e.g., recent growth in size of government with increases in current and capital spending: Mozambique now has very large public sector relative to comparable countries)
  - Financial market less developed (fewer instruments to hedge volatility)
- Mozambique already experiences high volatility in some key economic variables
  - Striking feature of real exchange rate: persistent volatility – Real exchange rate volatility shown to reduce investment, productivity, and growth with particular negative effects on tradables



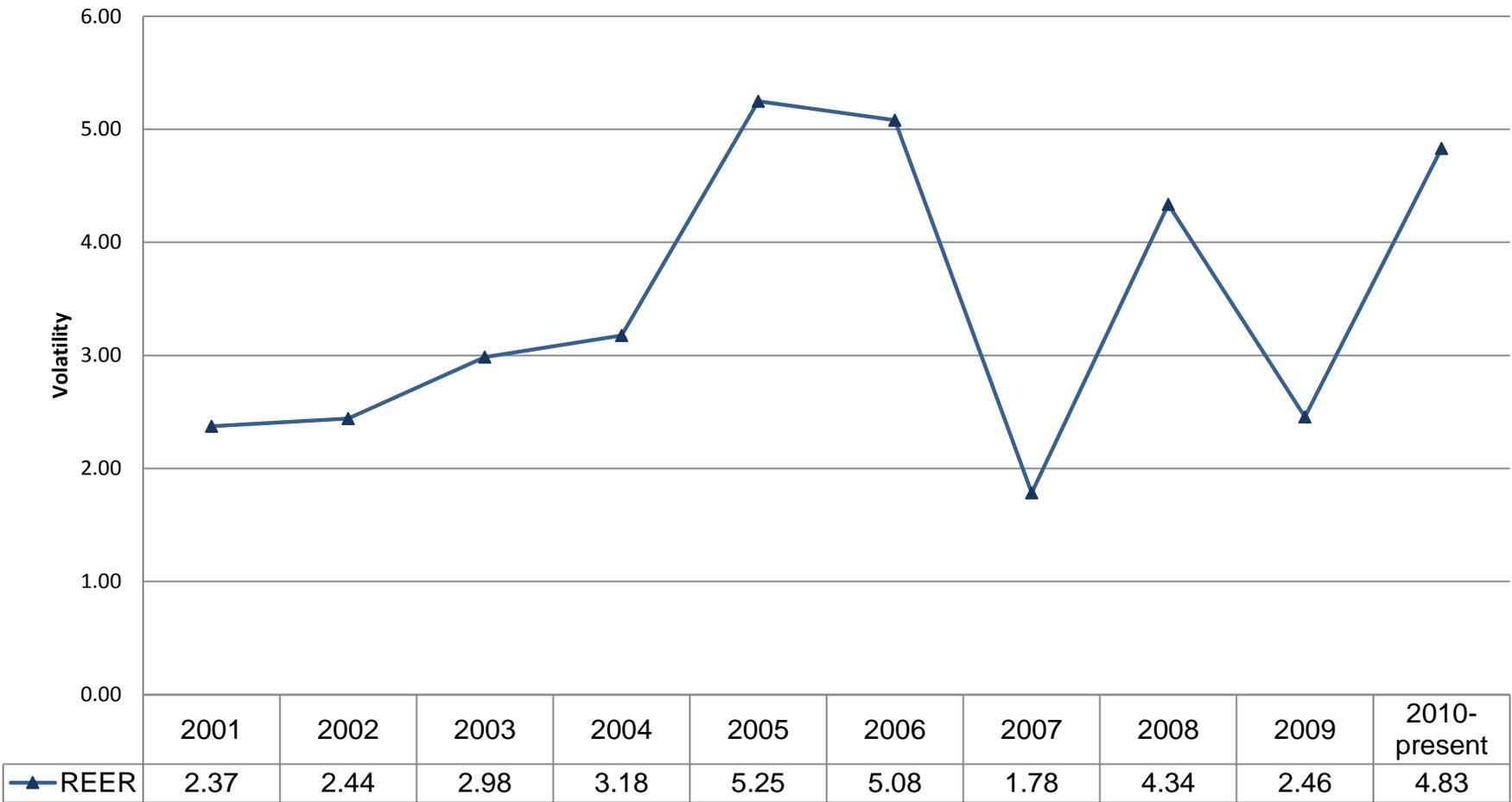
# Price Volatility of Selected Commodities, 1995-2008

## Commodity Prices: Monthly Averages





# Volatility of Real Effective Exchange Rate





## Boom-Related Vulnerabilities: Sensitivity of Real Exchange Rate

- **Key vulnerability is sensitivity of real exchange rate to fiscal spending:** Absorptive capacity of economy exceptionally limited today. Makes real exchange rate more sensitive to public spending. If fiscal spending is too large and/or expands too quickly, inflation in non-tradable prices and real exchange rate appreciation can become excessive (driving real appreciation above nominal appreciation – see discussion slide 6)
- **Second vulnerability is sensitivity of real exchange rate to commodity price fluctuations:** As commodity revenues increase as % of GDP, Metical likely become a “commodity currency,” such as currencies of other large commodity exporters (i.e., a primary determinant of real exchange rate variability will become swings in world commodity prices -- when prices rise, exchange rate appreciates; when they fall, it depreciates) – Result: economy more susceptible to external shocks and volatility, damaging growth prospects.



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## Boom-Related Vulnerabilities: Quality of Public Institutions

- Well-functioning fiscal management, investment management, and control of corruption important to avoid negative boom effects and turn boom positive for development
- Today, Mozambique exhibits significant vulnerabilities in quality of public institutions, which is worrying (**see next slide**)
- Fact that public effectiveness, corruption, and rule of law continue to be weakest areas worrying because research indicates that “point-source” resource exports are problem for countries lacking strong capability of public institutions
- Government adoption of Extractive Industry Transparency Initiative is a positive sign for the future



## Mozambique Governance Indicators

	<b>Mozambique Rank</b>	<b>Mozambique Score</b>	<b>Sub-Saharan Africa Score</b>
<b>Government Effectiveness</b>	136	- 0.55	-0.78
<b>Political Stability</b>	89	0.27	-0.51
<b>Voice and Accountability</b>	117	-0.15	-0.62
<b>Regulatory Quality</b>	133	-0.40	-0.70
<b>Rule of Law</b>	139	-0.56	-0.72
<b>Control of Corruption</b>	122	-0.41	-0.60



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## Boom-Related Vulnerabilities: Absorptive Capacity

- Capacity to absorb large increase in fiscal spending severely limited in short to medium-run; spending (investment or consumption) likely to run into bottlenecks, reducing value of spending
- Basic problem: steep supply curves (i.e., costs rise fast), for non-tradable goods production and inputs – spending quickly results in higher inflation and real exchange rate appreciation
- Steep supply curves caused by (a) critical shortages in skills and infrastructure (b) less developed financial markets (c) inefficiencies and constraints in the business environment
- End result: low investment efficiency of public resources (i.e., low increase in public capital stock per \$ spent on public investment).
- Investment efficiency 50%, on average, for LDCs. Mozambique right now may be lower (Public investment management system ranks below average for sub-Saharan Africa); need time to build up absorptive capacity (for public institutions and private sector)



## What Can Be Done to Address Mozambique's Boom-Related Vulnerabilities?

- Overarching constraints to policy formulation:
  - Revenues result from depleting finite stock of resources (need to address sustainability and inter-generational equity concerns)
  - Revenues highly uncertain – commodity prices and volumes highly volatile.
  - Low-income, capital-scarce country (need to reduce poverty and increase investment in public goods (education, health and infrastructure) to grow faster
  - Current capacity to rapidly absorb boom revenues limited today: (a) public investment process still weak; limited ability to deliver high returns on very large volumes of investment and (b) supply curves for non-tradable outputs and inputs steep and costs and prices rise fast.
- **Bottom line:** (a) adverse effects of boom likely to be stronger; policy needs to explicitly address potential volatility and Dutch Disease problems (b) public investment constrained by absorptive capacity – in public and private sectors



## Policy Options

- **Managing volatility:**
  - Short-run volatility: Commodity price swings lead to revenue volatility, complicating fiscal management. Adopt **price-based fiscal rule** delinking fiscal expenditures from resource revenues (rule focuses on structural primary expenditure balance target; revenue computed using average past prices verses current prices; allows build up of accumulated buffer to smooth volatility); can combine with **expenditure growth rule** (e.g. limit growth to 15% real increase yearly) to deal with production volatility.
  - Long-run volatility: Resource revenues exhaustible; need to deal with long-term sustainability of revenues and intergenerational equity to avoid large spending adjustment when resources depleted. Policy option: **price-based fiscal rule and structural primary expenditure balance target** to generate savings (e.g. 1% of non-resource GDP) for future generations and sustainability.



## Policy Options, cont.

- **Managing negative effects of Dutch Disease and absorptive capacity constraints:**
  - **Expenditure growth fiscal rule** to limit public investment spending in line with absorptive capacity
  - **Sovereign wealth fund (SWF)** with two functions: (a) a stabilization function to assist in smoothing fiscal spending (b) a saving function for future investment needs, and intergenerational equity. Flows into and out of SWF need a **fiscal rule** determining share of resource wealth to be saved and invested, considering need for budget stabilization, absorptive capacity constraints, and intergenerational equity.
- SWF reduces spending effect in economy; is a special kind of exchange rate protection policy moderating Dutch Disease – benefits firms in non-resource tradable sectors in a uniform way, not selectively. Could moderate Dutch Disease with selective protection (subsidies, tax breaks, tariffs) – much less desirable than exchange rate protection – selective, uneven protection can be inefficient and generate rent-seeking.
- Exchange rate also protected by BOM accumulating reserves, but difficulties with increasing reserves, once BOM has enough (judged by precautionary and monetary criteria) it is costly as long-run strategy



## Resource-Based Industrialization or “Benefication” of Natural Resources

- Some researchers have argued that Dutch Disease effects would be counter-balanced by benefication, as coal and gas create a competitive advantage in energy-intensive products, opening up a whole new source of production and exports.
- Idea is that it is a logical, natural progression for a country exporting raw materials to move downstream into processing, and therefore policies encouraging downstream processing can promote industrialization and improve trade. Is it true?
- Some problems with basic idea:
  - With increasing world trade today, high forward-linkage possibilities do not automatically convey an advantage to developing resource-based production. Forward-linked industries can be established in any country able to import unprocessed resource. Only if home processing can supply product at lower cost is it advantageous to invest in developing the industry at home.



## Resource-Based Industrialization or “Benefication” of Natural Resources, cont.

- Cost factor determined by comparative advantage and technological ability. Mozambique’s endowments (and technological capabilities) do not give it overwhelming cost advantage in highly capital-intensive industries, which (a) require enormous capital investment (b) necessitate huge complementary investments in infrastructure, and (c) employ an exceedingly small portion of the country’s large workforce – access to coal and gas may not be enough.
- Advocates of benefication argue that access to coal and gas **at cost of production** makes such investments logical. Unfortunately, it is not that simple. Subsidizing a key input to downstream investors in this way (a) is fiscally costly, as the raw material could have been sold on world markets at higher price and (b) encourages development of an (inefficient) energy-intensive industry that can be in trouble if energy prices rise (e.g., when the gas runs out in 2055).



## Resource-Based Industrialization or “Benefication” of Natural Resources, cont.

- Finally, fostering capital-intensive downstream industry development does not fit easily into Mozambique’s objective of promoting more inclusive growth: (a) it is not labor-using, so does not assist much with poverty reduction; (b) it does not link up well with the rest of the economy (e.g., Mozal); (c) it does not promote much “learning” because of lack of employment; and (d) it requires large investments in industry-specific infrastructure in a capital-scarce country.
- **The bottom line:** There are opportunity costs to policy choices. Adopting a linkage-based strategy to promote industrialization means other policies that might be more productive in meeting the country’s objectives will not be pursued. Mozambique needs to consider benefication investments carefully, they are not simply a natural progression.



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***Thank you!***  
***Obrigada!***