Fostering Knowledge and Technology Spillovers in Extractive Industries

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Introduction

Despite recent economic crisis FDI flows to Africa still on the rise reaching $60.4 billion in 2014. (See AfDB, 2014)

African inward FDI mainly directed at resource-rich countries.

Countries increasingly aim at benefitting from technology and knowledge spillovers. Spillovers may occur through different channels

- Demonstration-imitation channel
- Labor mobility channel
- Backward linkage channel
- Export channel

Demonstration-imitation Channel

Local Firms may imitate

Foreign Firm

- Management Practices
- Technology

Imitation – Case Studies

Management Practices

Mobil-Statoil

Statfjord Field (1970s)

Statoil hired Americans for Leadership Positions
Created a structure that was closely modeled on Mobil's organization

Technology

Petrobras

(1970s) Early Production System (EPS) approach applied in the North Sea
Acquired FPSO vessel (1998) from service company (USA) Modified the drill pipe riser with FMC Technologies

Reducing the Technology Gap to Imitate

Norway

Joint research International Oil Companies and local educational institutes

Statoil took over operatorship of the Statfjord field in 1986

Brazil

Research by Petrobras through its research center (CENPES)

Petrobras leader in deep-water exploration and production

Labor Mobility Channel

Transfer of physical technology (equipment) to subsidiaries

Need for transfer of knowledge on how to effectively use it

Local workers trained by foreign firms

- Hired by local firms: increasing local firm productivity
- Start their own businesses

Labor Mobility – Case Studies

Senior personnel at South Africa's mining equipment and service suppliers

Previously employed by foreign mining companies (Farole and Winkler, 2014).

Developed knowledge and skills as technicians on mine sites or worked for research centers

Ghana

15% of managerial employees and 13% of technical employees in local mining firms.

Mozambique

13.1% managerial employees and 5.6% of technical employees in local mining firms

Technology Transfer Cost & Hiring Local Workers

Technology transfer cost

"Cost of transmitting and absorbing all of the relevant unembodied knowledge."

(Teece, 1977)

In many Sub-Saharan African countries

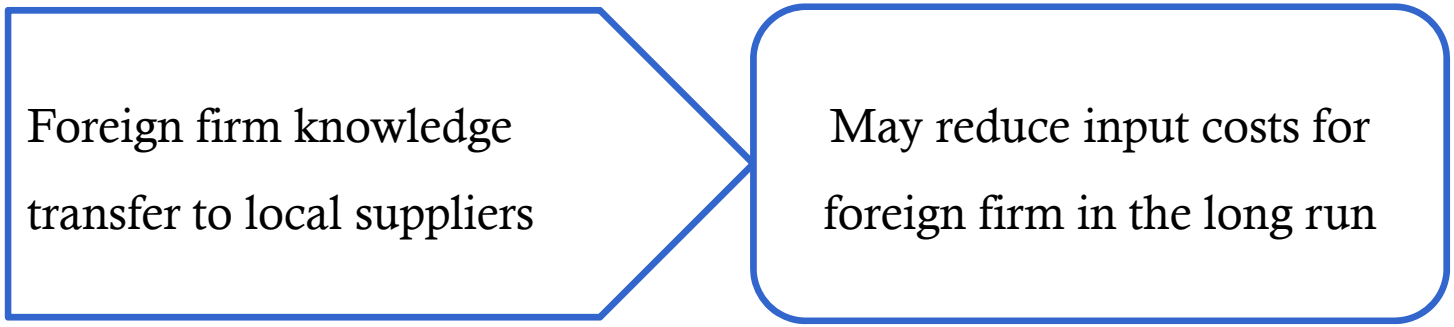
- Lack of basic (technical) skills

High cost of job specific training. Dependence on expatriates.

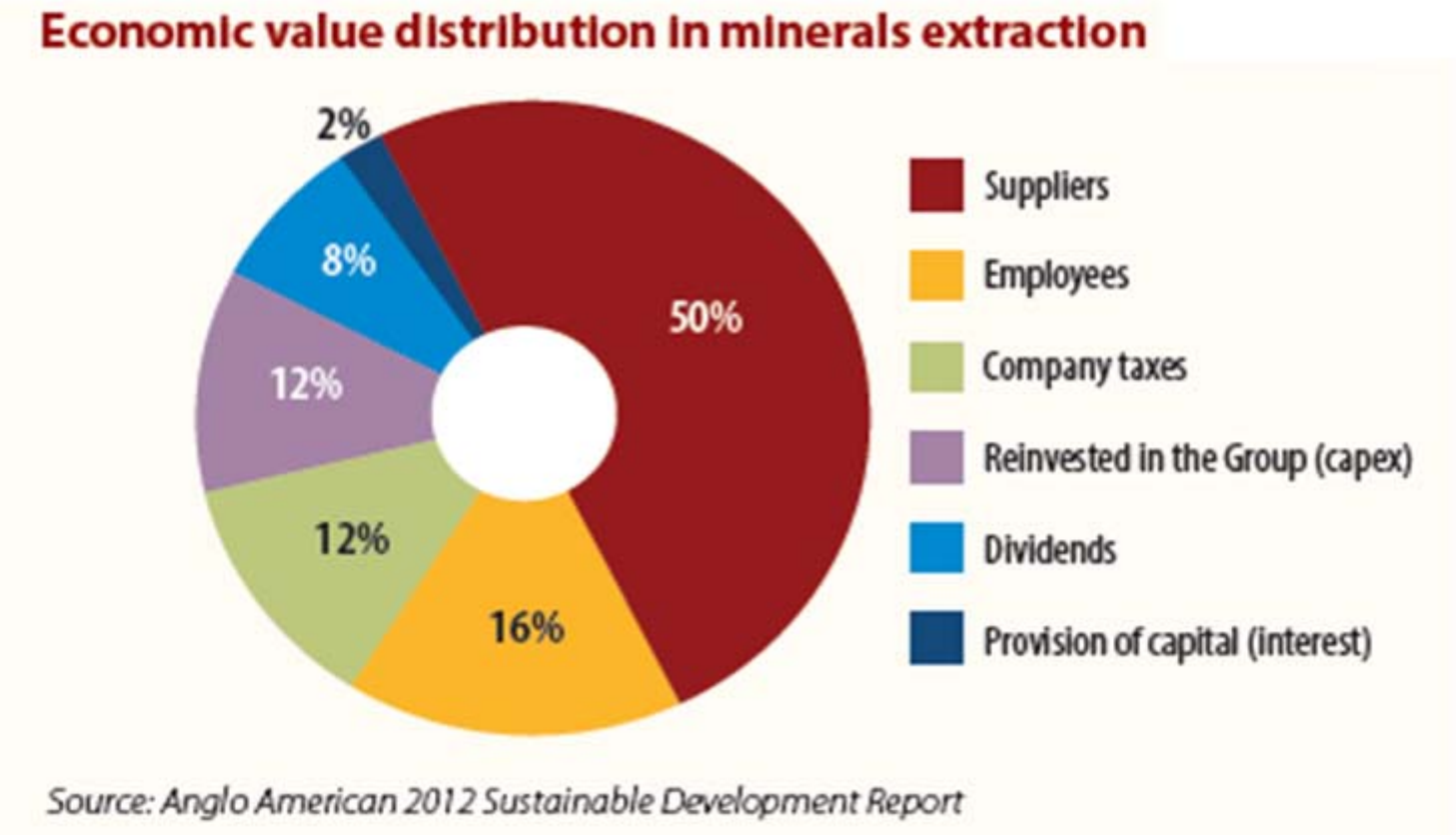
Less room for knowledge spillovers through labor mobility

Need for more technical training facilities

Backward Linkage Channel



Importance of the Backward Linkage Channel



Source: Anglo American 2012 Sustainable Development Report

Collaboration with Local Suppliers – Case Study

BHP Billiton in Chile

Snapping of shovel cables

Collaboration with local suppliers to develop a solution with mine site as testing ground

Local supplier Prodinsa increased shelf life of cables by approximately 40%

Source: BHP Billiton Copper 2013 Presentation: World-class suppliers to the global mining industry

Risks of Ill-designed Local Content Legislation

"Window dressing" local supply by requiring local ownership

- Substitution of foreign company import by local firm import

- Higher cost, foreign companies
- No local value added

Lose-lose situation

Local manufacturing and service delivery by requiring local value addition

- Local or foreign owned supplier

- Company: closer to supply, lower risk
- Local value addition

Win-win situation

Export Channel

Exporting involves fixed costs: Market information; Advertising; Distribution network

Foreign companies can become a channel for entering foreign markets

Export by Local Suppliers – Case Studies

Becoming an exporter after supplying foreign companies (Farole and Winkler, 2014)

- Ghana: A third of all surveyed local suppliers
- Chile: 42 percent of surveyed suppliers

Prodinsa

- has exported the solution to BHP Billiton's operations in Peru

Lessons and Recommendations

Imitation channel	Research by local and/or foreign firm in collaboration with local knowledge institutions is needed to reduce the technology gap and to make imitation possible
Labor mobility channel	Legislation on hiring local workers may be ineffective without an accompanying policy to increase local technical skills, which are needed in the resource sector
Backward linkage channel	Imposing legislation on buying from locally owned firms may not address increasing local production. It is local value addition in the supply chain that is beneficial
Export channel	Attract foreign firms with operations in different countries and stimulate them to do research in collaboration with local suppliers

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