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Local content, supply chains, and shared infrastructure

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Abstract: Local content policies in the context of extractive industries have attracted increased interest in recent years. Most countries with a significant extractive industry have included local content requirements either in their legislation or exploitation contracts. Such efforts may be constrained by low capacity of potential suppliers, low skills, and a number of other factors constituting the general business environment. A number of extractive industry companies have introduced supplier development programmes that attempt to reduce the constraints and skill gaps. Government policies on local content vary, with some prescribing quantitative targets for local content, while others focus on improving skills and raising the capacity of domestic industry. Infrastructure built for extractive industries can often be used by local populations and other economic activities. Difficulties in finding suitable financing arrangements have, however, limited the number of successful greenfield multi-client/multi-user extractive industry-related infrastructure projects.

Keywords: extractive industries, local content, industrial policy, infrastructure

JEL classification: L5, L7, O2, Q3

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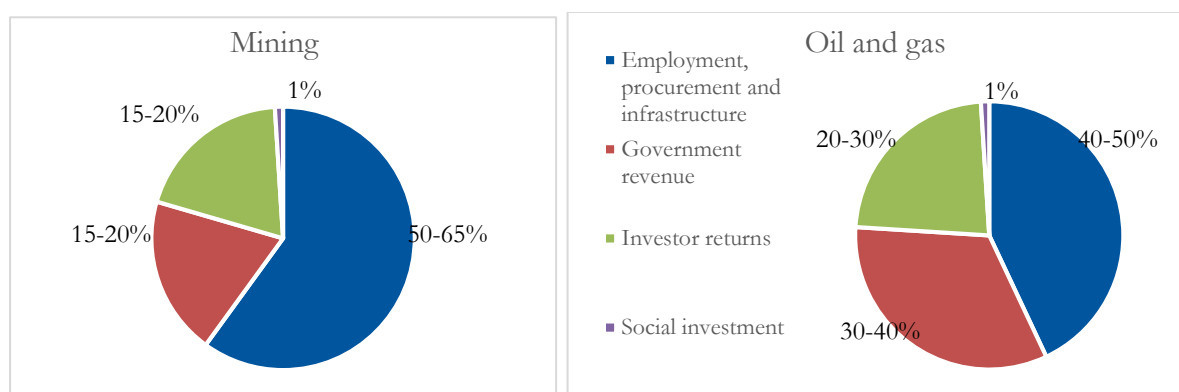
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1. Introduction

Extractive industries generate some revenue streams that do not go to the state or the operating enterprise but end up with a multitude of economic subjects in host countries. These streams would be of limited interest if they were small compared to those that accrue to the state. However, as seen from Figure 1, while government revenue typically accounts for 15 to 20 per cent of the total spending in mining and for 30 to 40 per cent in oil and gas, employment, procurement, and infrastructure account for significantly more.¹ The recipients of this spending are employees and providers of equipment and inputs (and their employees). In addition to providing income to the local/national population, employment, and extractive industry procurement usually also contribute to building skills, which may raise incomes also in the long run, beyond the life of the project in question. Such effects could be particularly important at the subnational level.

Although only a portion of total extractive industry spending is local or national, the size of this portion depends on a number of factors, most of which can be influenced by government policy. The aim of local content policies is to raise the proportion of spending that goes to recipients in the host country and/or in the area immediately surrounding the extractive industry site.

Figure 1: Average distribution of spending in extractive projects



Source: Author's estimates.

Section 2 in the following sets out the scope of the paper and provides some definitions. It also sketches the background to the policy debate around local content. Section 3 discusses corporate behaviour with respect to procurement. Section 4 describes and assesses policies for promoting local procurement, using some examples. Section 5 reviews practices and cooperation concerning multiple uses of infrastructure, and section 6, finally, attempts to formulate some general conclusions.

¹ Estimates such as the one shown in Figure 1 are rare. The World Bank (2014a) quotes figures from a report by Anglo American that are similar.

2 Scope and background

A wide definition of the scope for local content would include all the spending that does not accrue to government or investors. This would include procurement of both goods and services as well as employee compensation.

Although the term local content is often used in a wide sense, covering employment of locals and corporate social responsibility activities as well as purchases from national suppliers, in the following, the focus is only on procurement of goods and services from national suppliers. No distinction will be made between suppliers in the immediate surroundings of the mine or oil well and national suppliers, unless it is justified by the context. In addition, some additional discussion of the effects of extractive industry-related investment in infrastructure has been included because of the close relationship between infrastructure investment and industrial policy.

Local content policies in the context of extractive industries have attracted increased interest in recent years. This may be the result of disappointment with the results achieved in more ‘traditional’ policy areas, particularly maximization of government fiscal revenue. Partly, it is certainly also the result of a realization on the part of policy makers of the potential development effects from local content policies. Thus, recent regulations are moving towards a stronger emphasis on local content and most countries with a significant extractive industry have included local content either in their legislation or as a condition in exploitation contracts.

The intellectual roots of the policies, which emphasize the importance of establishing and strengthening various types of linkages, can be found in theories about supply chains and clusters.² The concept of linkages is particularly important.

The International Study Group on Africa’s Mineral Regimes, whose work laid the foundation for the African Mining Vision of the African Union and the United Nations Economic Commission for Africa, identifies:

... two main groups of linkages. The first includes backward/upstream linkages (to the mine) and forward/downstream linkages (to beneficiators or processors of the mine’s output). The second includes sidestream linkages (to industries or organizations providing technological, human resource and infrastructure inputs) and lateral migration linkages (development of alternative uses of generic technologies used in the industry). (Economic Commission for Africa and African Union 2009:102).

Local content policies are concerned with backward linkages.

However, where the theories attempt to describe and explain the processes by which industries are established, the policy formulations rest on the conviction that these processes can be influenced by governments, in particular that governments can, by promoting linkages, support

² A business cluster is a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field. Clusters are considered to increase the productivity with which companies can compete, nationally and globally. A supply chain is a system of organizations, people, activities, information, and resources involved in moving a product or service from supplier to customer. Supply chain activities involve the transformation of natural resources, raw materials, and components into a finished product that is delivered to the end customer. See, for instance, Porter (1998) and Kaplinsky and Morris (2001).

the evolution of a more diversified economy, less dependent on exports of natural resource products.

A common reference when discussing linkage policies and industrialization based on natural resource exploitation is the Nordic countries along with Australia, Canada, and the United States. Researchers have argued that, given the appropriate institutional framework and investment in education, the natural resource sector has driven knowledge intensification and industrial growth in these countries (Wright and Czelusta 2004). This research has been taken up by the current policy debate.

However, this inspiration from the older examples is questionable for several reasons that have to do with globalization:³

- Transport costs and tariffs are generally lower than they were when the countries mentioned industrialized. Local suppliers are therefore more exposed to international competition, which makes it more difficult to build backward links;
- For the same reasons, processed products are also exposed to international competition, which complicates the establishment of forward links;
- Processes are now standardized and mechanized which means that the advantage of low local labour costs is relatively less important;
- Skilled and specialized labour are widely available and mobile, so specialists can easily be recruited from other countries, reducing the need to train locals to fill skilled jobs;
- Access to state of the art technology is easy, which reduces the need for local innovation and adaptation of technology to local conditions.

Against this background, it would seem more appropriate for efforts to devise industrial policies based on linkages to build on the experiences of countries that have succeeded more recently in transforming from natural resource dependent to industrialized economies. Section 4 will discuss several examples, each of which may provide some ideas that could inspire policy making.

3 Local procurement: the corporate perspective

3.1 Corporate procurement

Before going into details about the factors that guide corporate procurement it is useful to recall some of the differences between oil and gas on the one hand and nonfuel mining on the other, not least because some of these differences determine procurement processes and also condition responses to government policies. These differences relate mainly to different structures of costs and to certain differences in how production is organized, and they are heavily influenced by economic and technical considerations:

³ Power (2002) disputes both the importance of extractive resources to the economic development of Australia, Canada, and the United States and the validity of comparisons with today's mineral dependent developing countries.

- In a typical oil operation, exploration/finding costs account for something like 50 to 75 per cent of the total costs of production (United States Energy Information Administration 2011). By contrast, in a typical mining operation that figure is much lower—circa 2 to 3 per cent only (Metals Economics Group 2012);
- There are similar differences as regards capital costs. Typically, in large-scale mining these costs amount to some 25 to 50 per cent of the total costs of production. By contrast in oil and gas operations they will normally amount to at least 75 per cent of the total;
- In relation to unskilled labour, mining operations typically use this in significant amounts for construction and related activities and this can result in such labour becoming a significant part of total employment costs especially since local content in service delivery is proportionately quite high and also engages significant quantities of unskilled personnel.⁴ By contrast, in oil and gas operations unskilled labour is rather more concentrated on tasks that are less directly connected to operations such as catering or security;
- Large mining companies typically obtain their specialized equipment from a small number of companies, many of which will be foreign based. The mining company itself typically uses and operates that equipment and the associated technology. By contrast, in oil and gas operations it is common for a third-party service company to be both the user and sometimes the owner of the equipment, so large parts of the actual exploration and also the extraction work is carried out by these third-party companies rather than by the oil or gas company that has been granted a concession or contract;
- A final important difference is that the equipment and associated technologies utilized in extracting oil and gas are highly specialized and very high cost, and they also have few possible uses in other industries. As a consequence, there are high entry barriers to those companies who might aspire to produce such equipment. By contrast, quite a lot of the equipment and the technologies used in mining operations have more than one use. Much of it is also cheaper to supply. All of this means that entry barriers for potential suppliers are lower and that some suppliers can follow a gradual process of moving in from initially acting as agents for other equipment suppliers to later carrying out some repairs and maintenance, to then producing spare parts, and to finally becoming equipment suppliers in their own right (Haglund et al. 2014a).⁵

A good starting point for a discussion of local content is to recognize that most extractive companies have good reasons to form close relationships with local suppliers. Using such suppliers reduces transport costs and waiting times, and it may be easier to build trust and long-term cooperation with a nearby supplier in order to shape the development of products, services, and processes than to deal with an overseas supplier. This being said, large extractive companies with activities in several different countries often find it convenient to use the same supplier for a given type of equipment. This may be the case in particular for equipment that requires training to

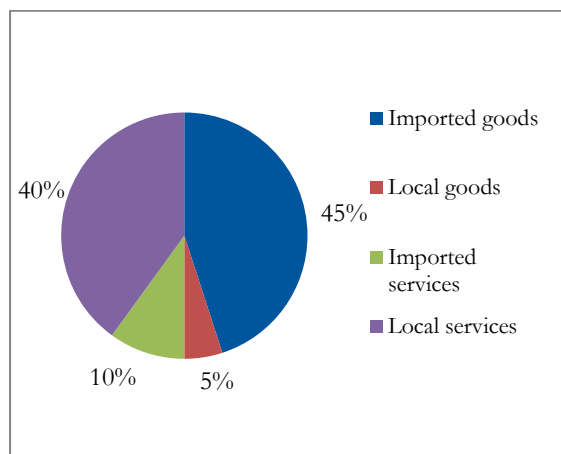
⁴ For example, a report by the Chamber of Mines of Zambia and ICMM (2014) concluded that almost all of the services purchased by Zambian mining companies are obtained from local suppliers. This is in sharp contrast to the percentage of goods procured locally.

⁵ The experience in Zimbabwe is instructive since it demonstrates that linkages do not necessarily have to be built on a narrow sectoral basis. Small-scale mining companies in that country developed know-how because financial necessity forced them to source spare parts and maintain equipment for their own operations. Eventually, they began selling their services to other companies (Haglund et al. 2014a).

operate, that has to fit with other pieces of equipment, or that meets specifications included in contracts concerning insurance or other matters where the company's responsibility is engaged.

The empirical evidence shows that local content in the extractive industries is typically low, although much higher for services than for goods. Figure 2 shows typical local content shares for mines in developing countries.

Figure 2: Shares of total procurement in mines in developing countries, per cent.



Source: Author's estimates.⁶

The goods and services procured by extractive companies can be distinguished between 'core' (specific to extractive industries) and 'non-core' goods and services. Core goods include construction materials, plant, and consumables among others. Core services include toll mining or oil well drilling, repair and maintenance of plant and machinery, and security around critical operations areas and machinery. Examples of non-core goods include office equipment and stationery; while non-core services include catering and transport services for staff. The degree of outsourcing differs for each company. Smaller mining companies with limited internal capacity typically outsource more work to contract suppliers (Walker 2005).

A distinction should also be made between outsourcing to foreign original equipment manufacturers (OEM) and outsourcing to proximate suppliers that can deliver services such as catering, cleaning, security, and facilities maintenance.⁷ Both represent opportunities for local linkages: OEM firms may provide after-sales services requiring the hiring and training of nationals, while locally owned and managed firms may qualify for long-term service contracts.

⁶ Although percentages may differ, by and large, they are much the same in most developing countries. The reason for this is that the industries producing equipment for extractive industries are often dominated by a few companies. These companies have several producing units, either in countries where demand is very important or in their countries of origin. Accordingly, since all of these suppliers are rarely located in the same country, it is rare to see a figure above 30 per cent of local value added even in large and advanced economies. In Brazil, where ambitious local content targets have been included in oil and gas contracts, the share of local procurement (goods and services) for exploration and production was 61.4 per cent in 2010 (AFDB and BMGF 2015b: 33). It is likely that the share of local procurement was significantly higher for services and correspondingly lower for goods.

⁷ As a result, between a quarter and half of all staff on a mine site may belong to contractors. Reflecting the long-term nature of such engagements, the ICMM Mining Partnership for Development Toolkit defines 'direct employment' as including staff on the companies' payroll as well as contractor staff on-site (ICMM 2011).

The general trend towards greater outsourcing has been supported by the emergence of global supply chains. There are three drivers of this trend: (i) falling transport costs, partly due to improvements in logistics; (ii) falling transaction costs due to improved information and communication technologies as well as liberalized financial regulations facilitating international payments; and (iii) a shift to more liberal national trade policies, particularly large reductions in tariffs on manufactured goods.

A final trend shaping procurement decisions in the extractive sector concerns broader changes in the international institutional environment. Strengthened legislation concerning corruption may have had the unintended consequence of increasing concerns among companies dealing with local suppliers.

The origins of an extractive industry company's procured goods and services can usefully be split into the following categories according to their local value added (Haglund et al. 2014b):

1. **Direct imports.** No direct linkages beyond benefits to the national economy through customs duties.
2. **Domestic procurement with *minimal* value addition in the host country.** This includes goods coming through agencies that act as importers for international suppliers. The agencies provide varying but generally low levels of services, often limited to stockholding.
3. **Domestic procurement with *moderate-to-high* value addition in the host country.** This category includes suppliers of inputs that are at least partly manufactured in the host country. It also includes manufacturers of OEM goods, where the manufacturing takes place abroad, but the product is distributed through branches in the host country. These branches serve to provide a range of services such as installation, operating support, and after-sales service. Lastly, it includes the services (transportation, maintenance) where the value addition takes place largely in-country.

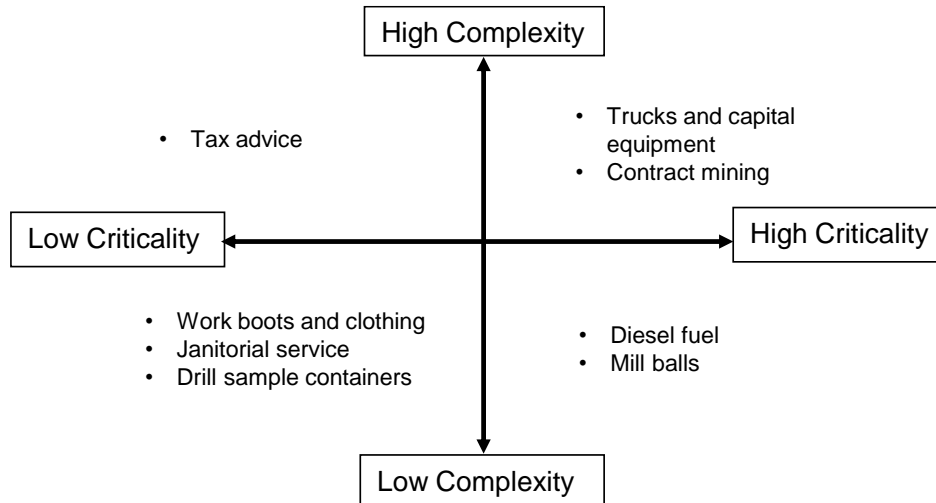
The third category is obviously the one that is of most interest from the point of view of productive linkages.

The company's approach to selecting suppliers will be guided by company policies as well as by local legislation (e.g. requiring public tenders for a certain size of contracts). In environments where public information about suppliers is not easily available (e.g. where systems of supplier accreditation are not developed), trust and the track record of a firm become particularly important, as do the processes used by companies to actively search for suppliers. When procuring smaller contracts, mining companies often send an inquiry to only a handful of previously successful suppliers, creating barriers to entry for other (potentially more capable) firms (Haglund 2010). This is partly due to short timeframes facing purchasing managers, who fall back on what they know best and so on existing trusted relationships (Hanlin and Hanlin 2012). Having a track record becomes particularly important in cases concerning complex inputs that are critical to the operation of a mine.

In evaluating suppliers, Kaplinsky and Morris (2001) have argued that firms consider a series of Critical Success Factors (CSFs), representing the particular features of a good or service that is required by the company. If a larger share of activities are outsourced, a correspondingly broader range of factors will be included among the CSFs. The CSFs include price, quality, ability to provide to scale, flexibility, speed of delivery, reliability of delivery, trust, and innovation, and may be reflected in process and product standards (AFDB and BMGF 2015b).

For inputs that are critical to the production process, CSFs include timely supply and conforming to adequate standards. These CSFs are likely to be more important than price, which is why such products may command higher margins. High margins are also a characteristic of more complex products, which typically require higher product and process standards. Procurement by mining companies (and by oil and gas companies) can thus be structured along two dimensions as in Figure 3: criticality and complexity (Mjimba 2011).

Figure 3: Supplier matrix and selected supplies to mining companies



Source: Mjimba (2011), reproduced with permission.

In addition to the challenges of developing specific capabilities that meet the demands (CSFs) of mining companies, would-be suppliers also face a range of more general challenges embedded in their operating environment. These are challenges that are systemic in nature, reflecting the existing policy, institutional, and socio-economic framework of the countries in which they operate. Examples of key aspects of the enabling environment are listed below (Haglund et al. 2014b):

- **Access to public skills and small and medium enterprise (SME) support programmes.** As the mining sectors in many resource-rich countries have boomed, shortages in many semi-skilled professions have appeared and skilled individuals are frequently lured away by higher-paying industrial firms. This situation presents a disincentive for smaller companies to invest their own funds in building skills, as there is no way of assuring that individuals will remain within the firm;
- **Infrastructure services.** The ability of a domestic SME to be competitive depends on the availability of a range of infrastructure services, e.g. reliable supply of utilities (water and electricity) and affordable telecommunications;
- **Availability of local inputs at stable prices.** Where inflation is persistently high, this will undermine the competitiveness of domestic suppliers;
- **Adequate and predicible institutions to support the private sector.** Transparent and simple licensing procedures and independent courts help to provide assurance that property rights will be enforced;

- **Access to finance.** Companies need timely access to finance in order to expand and grow. The ability to access finance depends on the existence of a competitive banking sector as well as the existence of collateral that is acceptable to lenders.

3.2 Supplier development

In order to overcome the constraints just described, extractive industry companies engage increasingly with suppliers through a process of proactive upgrading and support. In particular where supply is considered critical for the operation of the mine, companies will frequently adopt a range of measures to support the supplier through provision of capital, training, and information. However, supplier development and upgrading typically focuses on firms that are already in the supply chain. Suppliers that gain access to contracts with the lead firm are thus more likely to receive on-going upgrading support and thus entrench their position further. Lead firms may utilize one or more of the following types of assistance (Haglund et al. 2014b).

Provision of finance. Companies may support SMEs through joint financing mechanisms. Other initiatives include partnerships with commercial banks or non-traditional forms of collateral (for instance, by providing invoice factoring, invoice discounting, optimization of payment terms).

For example, under the INOVE supplier development programme, which was introduced by the Brazilian mining company Vale in 2008, invoice factoring and working capital loans are provided through Vale in a partnership with commercial banks. This responds to the difficulties faced by suppliers in meeting Vale's 90-day payment terms (ICMM 2013:55).

Provision of information and supply chain policies. Support may include provision of data on expected future demand as well as the product and process standards required by the firm, in order to help with pre-qualifications. For example, mining companies can optimize payment terms to minimize working capital requirements of suppliers, and put in place policies that require primary (so-called 'Tier 1') contractors to pay sub-contractors without delay. Other approaches include sharing of supplier databases with Tier 1 contractors so the latter can more easily partner with local firms.

Barrick Lumwana is a large copper mine in Zambia's Solwezi district. Its Local Contractor Development (LCD) programme:

aims to engage local SMEs and micro-businesses as suppliers in the mine's value chain and to help these micro and SMEs establish themselves in the competitive market of corporate clients. After two to three years in this supplier development programme, participant businesses are expected to grow and 'graduate' to the open market, in which they will compete with established regional, national and international service providers. ... The programme estimates that in five years, over 1,000 micro-enterprises and SMEs will eventually benefit from training and support under the LCD, and that over 10,000 low-income people will benefit indirectly from the venture over the long run. These include the entrepreneurs benefiting from training and the preferential contracts they win, as well as SME employees and their families, with an estimated 30% of beneficiaries being women. (The Practitioner Hub for Inclusive Business undated)

Provision of training/capacity building. There is some evidence that small firms often benefit more from management training rather than process upgrading—suggesting that an understanding of business management must precede upgrading of technical processes. To encourage capacity building of domestic suppliers, lead mining firms sometimes require that Tier 1 contractors

provide training to local suppliers, including mentoring, health and safety standards, accounting, and finance. Mining companies can support Health, Safety and Environment (HSE) certification, e.g. by including suppliers in company HSE training, providing awareness-raising of company requirements and pathways to achieving these.

The Diavik Diamond Mine in Canada's Northwest Territories has applied an integrated approach to local training, employment and procurement. ... While most Aboriginal employees are first engaged in entry-level or semi-skilled positions, the mine seeks to expand their skills through its own apprenticeship and professional development programmes, as well as with a community and government partnership that administers a series of work force development programmes. (ICMM 2010: 48–49)

Although the mine did not meet its Aboriginal employment commitment, reaching 34 per cent instead of the targeted 42 per cent in 2008, this was not an issue, since the absolute number of people was far higher than the original estimate (Östensson and Roe 2013).

Provide support for product testing and development. This includes joint product development/testing as well as support whereby the lead mining firm inspects raw material quality or provision of feedback on product quality to suppliers to enable learning over time.

A number of extractive industry companies have detailed and ambitious policies for supplier development in some or all of the areas listed above. One of the best known is the example shown in Box 1.

Box 1: Anglo Zimele, South Africa

Anglo Zimele (AZ) was set up in 1989 by Anglo American with the objective of supporting enterprise development. The policy context was critical in the establishment of this initiative, which can be seen as a successful response to the emerging Black Economic Empowerment policy at the time in South Africa.

The AZ initiative currently includes five funds, the biggest of which is the 'supply chain' fund. The fund supports SMEs with financing (debt and equity), advisory services (technical and business advice), and implementation (mentoring during project delivery). AZ is run on a commercial basis—funding is provided where it is expected to generate a return (AZ does not provide any grant funding). During the 15 years until 2016, AZ funded 1,885 companies (Anglo American 2016).

The AZ strategy is to provide equity funding (up to 49 per cent) as well as support with unsecured debt financing when appropriate. The provision of equity stakes allows for alignment of incentives and increases commitments of providing business advisory support. Exit is normally within 3 to 5 years.

The initiative is implemented through a network of regional 'hubs' that distribute services, including support on corporate governance and management; legal, accounting, and public relations; and safety, health, and environmental standards.

A key feature of AZ is its combination of a proactive and demand-driven approach to identifying gaps in the market. On the one hand, AZ is in touch with Anglo American business units in South Africa to understand their future demand and perceived constraints on supply, thereby informing the approach to targeting SMEs for enterprise development. On the other hand, AZ responds to applications for funding submitted by entrepreneurs who approach AZ with a business idea or proposal, in particular in areas of economic potential that are not part of the mining supply chain.

Sources: ICMM (2010) and Anglo American (2016).

3.3 Some conclusions

The international extractive industry is highly capital and skill intensive. Its operations have to conform to a large number of regulations concerning financial, environmental and social matters, both international and national, and have also to withstand intense scrutiny from media and civil society organizations. This creates an environment where much of its supplies are of a potentially strategic and critical importance and the use of untested local suppliers carries risks. It makes no difference to regulatory authorities or to the media if a faulty installation was due to errors on the part of a supplier or the extractive company itself—and rightly so. From the local suppliers' point of view, however, the consequent demands placed on them may be experienced as very challenging.

In response to this situation, and since, other things being equal, it is usually in the extractive company's own interest to build close relationships with local suppliers, many companies use supplier development schemes. These can range from providing occasional on-the-job training to highly structured and standardized schemes that are applied in many of the company's areas of operations. Larger companies are clearly better placed to develop and implement such schemes, but cooperation among companies, for instance, under the auspices of a Chamber of Mines,⁸ can do much to facilitate the participation of smaller oil and mining companies.

Companies may also go beyond supplier development and accord local suppliers various forms of preferential treatment, including (Esteves et al. 2013a):

- Assigning higher preference weightings to local businesses in competitive bidding processes;
- Sole-sourcing arrangements with local suppliers;
- Price matching, that is, allowing local suppliers to match the price of other suppliers;
- Breaking large contracts into smaller ones (unbundling) to create opportunities for smaller local suppliers;
- Requiring outside suppliers to subcontract locally or enter joint ventures with local suppliers.

⁸ A good example is in SE Para state in Brazil where rapid progress in increasing local supply chains was achieved through partnership between Vale SA—the leading Brazilian mining company—and the local Chamber.

4 Policies for influencing supply chains

4.1 Trade-offs and constraints

Broadly, governments have two ways of increasing the contribution of the extractive industry to expanding the local industrial base (Esteves et al. 2013a):

- By maximizing revenue from extractive activities and investing this revenue in infrastructure and other policy initiatives that can support the development of the industrial base;
- By maximizing local content, where the host government requires the share of local content to be greater than what would have resulted from the procurement of goods and services in an open market. The aim of imposing local content measures is to make it easier for local businesses to supply international oil, gas, and mining firms and their large contractors, and benefit from training and transfer of technology.

For companies, however, the presence of specific local content requirements may have an adverse impact on their cost structure and so affect their profitability, thereby reducing the tax base for the government. This would happen if locally available goods and services are not priced competitively when compared with the companies' traditional suppliers. For governments, a balance between the two strategies requires taking into account the fact that while the fiscal instruments typically provide revenues at the national level, local content policies can respond to the interests of local communities, thereby enabling companies to secure a social licence to operate and contribute to economic diversification (Estevez et al 2013a).

There are numerous definitions of what is a local company. For example, a company may be considered local if it falls within any of the following categories (Paul and Pierre 2010):⁹

- Local registration: legal entity is registered under local law;
- Local ownership: a certain percentage of the company is owned by citizens of the country or by existing locally owned and registered entities;
- Local workforce: a majority of the company's workforce, whether directly employed or on contract, are citizens of the country;
- Local value added: a specific percentage of goods/services is produced within the country.

The last definition would seem to be the one that is most closely aligned with the objectives of most local content policies. It is, however, sometimes difficult to apply in practice and governments may settle for a local content definition that is easier to measure.¹⁰ When local content targets are used, governments may also be lobbied by extractive industry companies to apply a measure that makes it easier to meet the target.

⁹ In most cases, 'local' actually means national. Nwapi (2015a: 187) criticizes this 'centralist' approach and argues that 'Given that revenues from extractive resources are managed by national governments in most jurisdictions, LCRs [local content requirements] can provide a mechanism to meet the demands of subnational stakeholders, such as local governments and communities. This will in turn enable companies to obtain the social license to operate'.

¹⁰ The difference between different measures can be striking. In the case of Zambia, it has been estimated that although the majority of goods are procured from Zambian suppliers, less than 1 per cent of the goods procured by the mining sector are actually manufactured in Zambia (Chamber of Mines of Zambia and ICMM 2014: 66; Kasanga 2012: 6).

Governments may aim to promote backward linkages through regulation. However, countries that are members of the World Trade Organization (WTO) are, in principle, constrained in terms of the requirements they can impose with respect to local content.^{11, 12} In particular, as noted by Cordes et al. (2016: 78), ‘members of the WTO are bound by the national treatment obligation (NTO) clause under which foreign companies cannot be forced to buy goods¹³ from local suppliers or hire suppliers of certain services¹⁴ if a better alternative in terms of price or quality exists abroad’. Many low-income countries (LDCs) are or have been subject to exemptions from the WTO rules and several of the relevant agreements provide for some flexibility in the application for lower-income countries, including during transition periods following WTO accession. Currently, 31 LDCs are able under the WTO rules to introduce measures that deviate from the NTO clause for a defined period of time on the grounds of their ‘individual development, financial or trade needs, or their administrative and institutional capabilities’.¹⁵ Out of this group, only Angola has introduced explicit local content requirements. (Esteves et al. 2013).¹⁶

In addition to WTO rules, international investment agreements can also limit the possibility to legislate in favour of local content. Some agreements go further than the WTO provisions and prohibit all types of measures related to local content and performance requirements in general.¹⁷

Despite the relatively clear WTO rules regarding the (in)compatibility of mandatory and quantitative local content requirements and despite the proliferation of such measures in particular in resource-rich countries, so far only two cases related to Trade Related Investment Measures (TRIMs) have been brought under the dispute settlement mechanism. ... None of them relate to the extractive sector. This may be because governments are reluctant to challenge tools that they themselves have used or continue to use. Or it may be because investors do not find that the WTO dispute mechanism responds sufficiently to their concerns, in particular as it does not confer monetary compensation and therefore may not repair losses due to contract cancellation or penalties incurred.

¹¹ The discussion of WTO regulations draws on Cordes et al. (2016).

¹² For an overview of international regulations concerning local content, see Ramdoo (2015).

¹³ All WTO members ‘must adopt and abide by the obligations of the Trade Related Investment Measures (TRIMs). The following types of local content requirements are covered by TRIMs: requiring a company to purchase or use products of domestic origin; limiting the amount of imported products that an enterprise may purchase or use depending on the volume or value of local products that the enterprise exports; restricting foreign exchange necessary to import; and restricting exports’ (Cordes et al. 2016).

¹⁴ ‘A separate WTO agreement, the General Agreement on Trade in Services (GATS), covers investment measures related to services (in Article XVI). GATS only applies to those service sectors that the country chooses to include in its Schedule of Commitments’ (Cordes et al. 2016).

¹⁵ Under the modification of the agreement of TRIMs by Annexure F on Special and Differential treatment of the Doha Work Programme Ministerial Document (World Trade Organization 2005).

¹⁶ Article III(8) of GATT makes an exception from the NTO clause for government procurement. However, this exception does not apply to commercial resale. Accordingly, when Japan and the European Union challenged Canada’s claim that its Ontario provincial government’s feed-in tariff programme for wind and solar electricity generation concerned government procurement, the WTO Appellate Body found that the electricity produced using solar power under the programme was eventually purchased by the government for further distribution, that is, commercial resale. Therefore the procurement was not covered by the Article III(8) exception (Nwapi 2015a: 194).

¹⁷ Performance requirements are measures in law, regulation, or contract that require investors to meet specified goals when entering, operating, or expanding in, or leaving, a host country.

In contrast, most disputes regarding local content requirements in extractives have been brought by investors against host countries under dispute mechanisms of bilateral investment treaties. (Ramdoo 2015: 9)

4.2 Government policies

Governments use a wide range of instruments and policies to promote local content, from coercive regulations with quantitative targets to efforts aimed at enhancing the enabling environment, including through technology transfer and skills upgrading

Quantitative targeting

Among countries with coercive regulations, target setting may be more or less detailed. In some cases, fairly ‘blunt’ industry-wide requirements are applied. Here are some examples:

Kazakhstan requires mining investors to negotiate a binding agreement with the government establishing a certain percentage of local content. The Kazakh Government’s Decree No. 367/2010 (Government of Kazakhstan 2010) formalized the measurement of local content in goods, works, and services, using the ‘Uniform Method of Kazakh Content Calculation’ (the ‘Uniform Method’). Subsoil users are required to provide a 20 per cent discount to Kazakh manufacturers. (Östenson et al. 2014: 70).¹⁸ Failure to meet the targets can be punished with the loss of the licence. The results of the policy are not very encouraging. During the period from 2010 to 2012, for example, local content in goods was between 13 and 14 per cent, which is perhaps less than one would have expected and not significantly more than in other countries at a similar income level. Local content in services rose from 81.5 to 92.1 per cent during the same time period, but this also is not markedly better than in other similar countries (Esteves et al. 2013b). Moreover, Kazakhstan’s local content regulations require monitoring and reporting that carry costs for both government and companies.

Ghana applies different rules for oil and nonfuel mining. The local content policy on mining in Ghana was the product of a dialogue between the industry through the Ghana Chamber of Mines and the regulatory authority. According to Amoako-Tuffour et al. (2015):

Both mineral title holders and mining support providers must meet the following requirements:

- a. A procurement plan, covering five years, has to be submitted by companies.
- b. The procurement plan has to specify procurement and use of local products to the extent possible.
- c. The procurement plan is guided by a procurement list, developed by the Minerals Commission and to be revised annually.

¹⁸ Following its joining the WTO in November 2015, Kazakhstan has committed to passing laws and taking measures to review and amend all requirements that are inconsistent with WTO by the end of the transitional period (2021). Kazakhstan will: 1) introduce amendments to Law ‘On Subsurface and Subsurface Use’ aimed at removing measures inconsistent with the WTO TRIMs Agreement; and 2) sign supplementary agreements with subsurface users, which would remove WTO TRIMs Agreement-inconsistent measures from investment contracts. (World Trade Organization undated).

- d. Mining businesses with approved procurement and localization plans submit an annual report to the Minerals Commission demonstrating their level of compliance.

Ghana's policy in the mining sector is in the early stage of implementation. After several consultations between the Chamber of Mines and the Minerals Commission an initial list of 18 items earmarked for local procurement (point c. above) was pruned down to eight, constituting about 60 per cent of the value of the total local procurement budgets of the companies. Amoako-Tuffour et al. (2015: 8)

The regulations concerning oil are more ambitious. Operators, contractors, and sub-contractors must comply with specified minimum local content levels for goods and services, and companies have to submit plans to increase domestic content over time. All operators must, as far as possible, use goods and services produced or provided in Ghana by Ghanaian companies, even if their prices are higher by up to 10 per cent. Foreign companies that supply goods and services shall have local participation of at least 10 per cent initially, which must increase by 10 per cent (AFDB and BMGF 2015b).

In **Nigeria**, the Local Content Act (LCA) of 2010 provides for categories of activities (for example, floating products, storage and offloading vessels, steel plates) to be locally procured, with targets ranging from 45 to 100 per cent for the majority of service categories.¹⁹ For instance, reservoir services as they relate to well and drilling shall have 75 per cent local content level; research and development in relation to geological and geophysical services shall have 80 per cent local content level; while 4D seismic data processing services shall have 55 per cent local content level (Nwapi 2015b). 'Where bids are within 1 per cent of each other, the bid containing the highest level of Nigeria content should be selected provided it is at least 5 per cent higher than its closest competitor in terms of its Nigerian content' (AFDB and BMGF 2015b: 28). Companies may be subject to penalties for non-compliance, such as cancellation of projects and fines equivalent to 5 per cent of project value. The average local content based on the proportion of the value of contracts awarded to Nigerian companies is estimated to be 70 to 85 per cent. However, based on the proportion of contract sums spent on Nigerian-made goods, the figure is only 12 to 18 per cent (AFDB and BMGF 2015b: Annex A). One of the reasons for the relatively disappointing results may be the corruption vulnerabilities that are inbuilt in the LCA (Nwapi 2015b).

Galante (2013) describes that:

Since their beginning, the **Brazilian** concession agreements for oil and gas exploration and production have included provisions regarding local content and minimum percentages to be observed by the concessionaires. However, enforcing these provisions was a rather complex task, either because of the lack of qualified suppliers and service providers in the country (the main justification presented by the concessionaires) or because of the difficulty to confirm whether a specific good or service acquired in Brazil would satisfy the local content rules. The model was improved in 2007 with the National Petroleum Agency's (ANP) enactment of the Local Content Certification rules. These rules established a methodology to

¹⁹ 'Schedule A of the Nigerian Content Development Act specifies the level of Nigerian Content to be achieved per activity or input used by operators in the oil and gas sector. For goods and services such as steel pipes and plates, cables, valves, cement, audit services and geographical survey services, the local content requirement is 100 per cent' (Ramdoo 2015: 4).

calculate the percentage of local content in goods and services acquired in Brazil and provided clear rules and procedures for the accreditation of independent companies to certify such percentage. Under this revised system, a certifying entity (accredited by ANP) is responsible for measuring the local content found in goods and services acquired/contracted by concessionaires in connection with their oil & gas exploration and production activities in the country. Possession of a certificate issued by an independent entity enables the concessionaire to prove local content compliance for each specific good or service acquired in Brazil. Galante (2013: 2)

The Brazilian regulations have undoubtedly resulted in Petrobras relying on Brazilian suppliers to a larger extent than would otherwise have been the case. They have also resulted in considerable improvements in the technical capacities of these suppliers. However, the recent revelations of corrupt practices in the awarding of contracts have highlighted the risks associated with strong local content regulations. Where contracts are awarded on other grounds than price and quality, parties to a transaction may be tempted to manipulate the system. It now appears likely that local content rules will be either eliminated or at least given reduced importance when awarding contracts in the future (Reuters 2016).

Non-coercive approaches and the enabling environment

Several countries pursue policies that focus less on quantitative targets and more on promoting technology transfer and skills improvement. Creating an enabling environment through the removal of constraints can be a part of this strategy. To this end, some countries have adopted policies aimed at directly increasing the participation of local workers and suppliers without establishing legally binding national local content legislation and regulations. The legal texts may be very simple, for instance, as in the case of Lao People's Democratic Republic: 'To use as much as possible: local or domestic goods; transportation services of domestic transportation enterprises or companies; local labour who are Lao citizens in all areas of work based on their capacity' (Government of Lao People's Democratic Republic 2013: Article 65 3). Enforcement in these cases relies on mechanisms that range from specific commitments in production-sharing agreements to general agreements on the need to support local content that may not impose restrictions on companies. These types of policies can be initiated not only by governments but also by extractive companies, local and regional organizations, and non-governmental organizations, including at the community level.

A report for the World Bank on Central Asia prepared by Ana Mari Esteves and colleagues (World Bank 2014b) provided several examples of policies to help improve access to opportunities to local suppliers. These examples included the following:

- ...ensuring 'full, fair and reasonable' access to opportunities for local suppliers initiated by national or subnational governments (such as The Australian Industry Participation National Framework);
- compiling a list of 'capable' local suppliers by local government agencies (see for instance the supplier registry system developed by the Industrial Association of Antofagasta and mining companies in Chile); and
- harmonizing supplier requirements and encouraging the implementation of certification systems for local suppliers by local government agencies or mining companies (such as in the Atacama mining cluster, Chile). (World Bank 2014b: 16)

The report went on to add that:

A particularly relevant policy for local Small and Medium Enterprises (SMEs) is the requirement for ‘unbundling’ contracts (Canada, for example, established this under Participation Agreements between locally affected Aboriginal communities and mining companies). Unbundling contracts involves breaking packages of work or supply agreements into smaller parcels that are within the capabilities of targeted businesses to fulfill. The advantages of these types of initiatives are that they can be readily implemented because they do not depend on enacting regulatory tools, and that they can be flexible to the needs of the local economy and the mining companies. Their main disadvantages are that their effectiveness depends on the existence of a pool of competitive potential local suppliers, and that compliance cannot be legally enforced. (World Bank 2014b: 16)

Some examples are as follows:

Chile’s mining sector framework does not require any formal commitments to increasing local procurement. However, there is a strong culture of public–private collaboration in supporting supplier development and local procurement. Examples include the Mining Skills Council (CCM), in which all mining enterprises provide information on their needs in relation to skilled manpower. Programmes launched in the 1990s included support to large mining companies for spending on training and integration of local suppliers and assisting SMEs in meeting qualification needs, including through technical consultancy subcontracting exchange, management training, marketing, and export assistance. In 2009 the **Enhancing Competitiveness Program (PMC)** was launched. Activities include training, tender preparation, and innovation and research capacity support. The **Centro de Entrenamiento Industrial y Minero** (Industrial and Mining Training Centre, CEIM) has played an important role in improving the capabilities of suppliers. CEIM was established by the Escondida mine in 1999, with the aim of supporting mining clusters within Chile’s Region II (Antofagasta), thereby allowing suppliers to benefit from economies of scale and network externalities (Haglund et al. 2014b).

Norway has a highly skilled and internationally competitive petroleum-related service and supply industry, developed over more than 40 years of petroleum activities. Several regulations were passed in the 1980s and 1990s to support the development of this industry, including requirements for a local content plan to be submitted to the Ministry of Petroleum and Energy for approval before the grant of licence, and provision of training and hiring a certain number of Norwegian personnel. Operators were also required to conclude agreements with the Norwegian Ministry of Petroleum and Energy under which at least 50 per cent of research and development in connection with petroleum activities had to be performed in Norway (Columbia Center on Sustainable Investment 2016). International oil companies are required to announce their tender schedule and the list of companies to be invited. The Ministry of Petroleum and Energy is able to add Norwegian-based firms to the list. General estimates put the level of local content in terms of investment for the exploration and development of the fields at between 50 per cent and 60 per cent (measured by value added) and for maintenance and operations it stands at about 80 per cent (AFDB and BMGF 2015b).

5 Infrastructure

Mining usually requires very substantial investments in infrastructure such as road or rail transport channels—far more typically than is required for oil or gas exploration and production. Offshore

oil and gas activities are of course the least demanding in this respect. In particular, most large mines, require important investments in infrastructure in part to enable inputs and machinery to be brought in and finished products to be transported out.

Infrastructure that is built for extractive industries can often be used by local populations and other economic activities and can thereby help to position a region for more rapid economic development and diversification. There are many examples of regions experiencing periods of rapid economic growth due to the infrastructure improvements associated with mining investment (see Box 2).

Success stories can be replicated elsewhere if mine-related infrastructure is planned and built while taking other economic activities and local opportunities into account. Accordingly, the concept of a ‘mineral resource corridor’ has attracted increasing attention (World Bank 2012).

Box 2:. Effect of infrastructure improvement: Fungurume

In Fungurume, Katanga, Democratic Republic of the Congo, population tripled within a few years to more than 100,000. This was the result mainly of Tenke Fungurume Mining, a mining company that operates a copper mine close to the town, improving the road to the provincial capital, thereby cutting the driving time from two days to four hours, and building a new market. The improved road made it possible for traders from other parts of the province to reach Fungurume, thus increasing local supplies of consumer goods. It also provided local farmers with an outlet for their produce, allowing them to earn cash income. As a result, local incomes have improved, the local food price inflation that is often associated with large mining projects has been kept in check, seasonal food price variations have declined in amplitude, and the nutritional status of the population has improved.

Source: Östensson and Roe 2013

The Maputo Development Corridor (MDC)²⁰ which was officially launched in 1996, is probably the most well-known and successful example of resource corridor development: ‘The MDC represents the shortest road and rail connection between the Gauteng, Northwest, Limpopo and Mpumalanga provinces of South Africa and Gaborone in Botswana and a deep water port in Maputo’ (World Bank 2012: 17).

The main infrastructure investments of the MDC include the construction of railway links and a single toll road, rehabilitation of Maputo Port, construction of telecommunication and electricity links, and a one-stop border facility.

A number of industries have been established along the corridor:

- The world’s third largest aluminium plant, the MOZAL plant developed near Maputo;
- The Pande/Temane gas field, with a US\$1.4 billion pipeline to South Africa;
- The Beluluane Industrial Park (BIP), a 600 hectare industrial free zone next to the MOZAL plant (World Bank 2012: 21).

²⁰ The account of the MDC is based on World Bank (2012).

‘Other projects include a magnetite, vanadium and heavy minerals mining project, chemicals, manufacturing, a fertilizer plant, a project by the conglomerate Sappi and eco-tourism, lodge and game-park development’ (World Bank 2012: 21).

Despite the fact that the MDC is widely regarded as a success, there have been setbacks relating to the functioning of the corridor. According to the report of the World Bank these include delayed provision of rail services, lack of community engagement, environmental issues, legal matters, governance issues and investments. Furthermore, the goal of establishing an efficient, one-stop border post between South Africa and Mozambique has not yet been fully realized (World Bank 2012: 22).

The idea of resource corridors has attracted considerable positive attention, not least because of the simplicity and apparent logic of the concept. As often with simple concepts, however, the devil is in the detail and in the practical implementation. Public–private partnerships (PPPs) are central to the resource corridor concept since it requires both the government capability of establishing an appropriate regulatory framework and its convening power, as well as the large financial resources of the private sector. As pointed out by the International Finance Corporation (IFC 2013), there are, however, very few examples of successful greenfield multi-client/multi-user mining-related infrastructure PPPs in the world—and none of them are in Sub-Saharan Africa. This dearth of examples suggests that it is difficult to arrange financing. Given the reliance on project cash flow for repayment, the higher the complexity of the shared-use structure, the less bankable it will be. This means that larger mining companies will most likely have to serve as anchor clients to these projects. It also means that multi-user demands made to transport mining infrastructure operators might have to be initially or permanently restricted to secure, first and foremost, the delivery of an efficient mining transport system at the lowest possible cost to its anchor user/client (IFC 2013: 2–3).

Finally, it should be noted that resource corridors may have trade-diverting effects. Mine-related infrastructure typically connects mines directly to the coast. As found by Bonfatti and Poelhekke (2015), such infrastructure may bias a country’s transport costs in favour of overseas trade, to the detriment of trade with neighbours and regional integration. Coastal destinations with more mine to coast infrastructure import relatively less from neighbours, and this effect is stronger when the infrastructure overlaps with routes used to import from overseas. The effect is, however, reversed for landlocked destinations, where the mine to coast infrastructure will have to cut through at least one neighbour to reach the coast (Bonfatti and Poelhekke 2015: 1).

6 Conclusions

In many countries, efforts to leverage greater development from extractive industry investments have in recent years partly focused on strengthening backward linkages from the industry and, in particular, on raising local content. The industry is usually prepared to participate in such efforts, provided that their impact on costs is limited. In the short term, however, the scope for increasing local content in low-income and mainly agrarian countries may be constrained by the low capacity of potential suppliers, low skill endowments and a number of other factors constituting the general business environment. A number of extractive industry companies have introduced supplier development programmes that attempt to reduce these constraints and skill gaps. Such measures have had their successes. They are mainly effective in the long term, underlining the need to manage expectations and for local communities to be engaged in the process in order to avoid disappointments.

Governments have adopted varying approaches to local content policies. Some have prescribed ambitious quantitative targets for local content—targets that have often been met. The apparent success of these policies, does not, however, allow one to conclude that they have resulted in the actual accumulation of skills and improved diversification of the host country or local economy. There are a number of reasons for that.

First, success is often measured in terms of local content provision by firms that are locally owned or registered, rather than in terms of local value added. It is not clear that the policies have actually raised the proportion of locally produced supplies above what would have been achieved in the absence of targets. Second, quantitative targets carry risks of capture by local elites and corruption. The Petrobras scandal in particular should make all governments that consider the introduction of quantitative targets think twice.

Moreover, the international regulatory landscape is evolving in a direction that is not favourable to quantitative local content targeting. While many developing countries benefit from the exemptions from WTO disciplines accorded to LDCs, these exemptions will expire in a few years. Bilateral investment agreements often also prohibit or limit assertive local content policies.

Finally, rigid local content policies carry an undoubted economic cost and come at the expense of other income. For example, they may raise project costs by significant amounts and so undermine project economics, thereby both diminishing the country's standing as an investment destination and reducing government revenue from taxes.

A more constructive non-mandated approach is exemplified by Chile and Norway, where policies have focused on improving skills and raising the capacity of domestic industry to qualify as suppliers to the extractive industry. While these policies have certainly resulted in additional costs for the extractive companies, they have been acceptable to the industry because they have held out a reasonable hope that the local industry will eventually become a fully qualified partner and supplier. By focusing on building capacity, much of which can be applied outside the extractive sector, these policies also appear to provide additional resilience to the national industrial fabric, rather than locking local companies into a perpetual dependence on the extractive industry.

Since the shortcomings that constrain the building of backward linkages are usually readily apparent, it would seem reasonable and more productive to direct political attention to solving the problems directly and alleviating the shortcomings, thus creating an enabling environment that permits the supplying industry to develop its full potential.

Extractive industries often require significant investment in infrastructure. This infrastructure could be used by local populations and other economic activities and it would seem that this could help to stimulate rapid economic development and diversification. While the potential is certainly significant, the practical implementation has proved more complicated and considerable work needs to be done on PPPs for infrastructure investments since necessary requirements for success include both the government capability of establishing an appropriate regulatory framework and its convening power, as well as the large financial resources of the private sector.

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