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Value co-creation and local content development: the role of collaboration between foreign and indigenous firms

Irina Heim [0000-0003-3023-4839]

University of Reading, Henley Business School, Whiteknights, RG66UR
i.heim@pgr.reading.ac.uk

Abstract. Theoretical perspectives on local content development (LCD) are predominantly informed by economic and political theories. The aim of this paper is to develop the strategic perspective on local content in clusters. We define stakeholders in LCD, and give a definition of a cluster, taking into account increasing role of SMEs and local companies in a network that stakeholders create. We also formulate a conceptual model for LCD in clusters. This model fills the gap in theory embracing the role of local content policies (LCPs) in technological upgrade and diversification. This is qualitative research which adopts a case study approach. The focus of the research is on technological upgrade in the oil and gas and ICT industries in Kazakhstan.

Keywords: oil and gas industry, value co-creation, local content development, digitalization, clusters

1 Introduction

International business stream of research considers LCP as an instrument which is used to regulate foreign investments in the O&G sector and therefore refers to foreign-direct-investments (FDI)-assisted developmental strategy. This assume the reinforcement of “domestic industrial capacity” over an integration of foreign technologies and domestic competitiveness of certain industries (Narula, 2015). However, academic literature on local content is predominantly informed by economic and political theories at macro level, whereas
strategic perspectives at micro level are virtually absent (Hansen, 2017). This is problematic as the reason why LCPs may fail is that they are based on the insufficient understanding of stakeholders’ strategies and interests.

The aim of this paper is to develop the strategic perspective on local content. The research in this paper is motivated by the research problem how LCP can support organizational performance taking into account changing institutional environment and digital transformation in the whole economy and particularly in the O&G industry. As a first step in this paper we define stakeholders in local content development and give a definition of the cluster focusing on the increasing role of linkages between foreign-owned companies and local companies, in particular local SMEs, in a network that these stakeholders create. Then we formulate a conceptual model for local content development in clusters. This paper fills the gap in theory embracing the role of LCPs in technological upgrade, where technological upgrade is defined as increasing organizational performance and competitiveness based on the improved technology capabilities.

2 Literature review

2.1 Collaborative approach to LCPs

Shapiro and Rabinowitz (1997) provided an economical explanation for cooperative approach to regulation suggesting that collaborative has to be mixed with punishment. A collaborative approach to LCPs that defines the expectations of the government, while providing the IOC with flexibility to develop its own local content plans and procurement procedures can achieve greater results. According to Adewuyi and Oyejide (2012), knowledge-intensive sub-sectors such as for example ICT sector, feeding into the oil and gas industry can also serve other sector and neighboring countries, creating backward linkages and providing potential for spillovers. Backward linkages between a company and its suppliers are generally relatively labour intensive in nature, and thus an attractive source of diversification for governments. These linkages may also increase GDP and therefore governments may actively target linkages in their industrial policy in the hope that complementary development of the national system of innovation may
result in a competitive diversified economy in the future (Morris, Kaplinsky and Kaplan, 2011). Acheampong, Ashong and Svanikier (2016) shows that successful LCPs in oil and gas producing countries should focus on the development of linkages, develop clear measurements of benchmarks and industrial-supply base. Olawuyi (2017) suggests that governments must adopt a more collaborative approach built on clear, transparent and attractive LCPs, with adequate institutional support for IOCs to achieve those goals.

2.2 Innovations and development

A common assumption and major proposition motivating the field of innovation studies is that innovation matters for economic growth and competitiveness (Fagerberg, Mowery and Verspagen, 2008). The ability to create new technologies and to imitate foreign advanced technologies is indeed a crucial factor to sustain the international competitiveness of industries and the overall dynamics of a national system (Castellacci, 2008). Paradigmatic view of the process of technological change and economic growth stress the importance of technological paradigm in the growth and transformation of economic system. The technological paradigm is a set of interrelated and pervasive radical innovations that are originally produced in a given branch of the economy but may subsequently have pervasive effects on many other sectors of the economic system for a prolonged period of time (Castellacci, 2008). Recently, a set of interrelated innovations in software, telecommunications and semiconductor industry have created a basis for ICT paradigm which has effect in many industrial sectors, including oil and gas industry. According to Freeman and Louça (2001) this branch is characterized by the highest and most rapidly growing technological and economic opportunities. The second pillar of the technological perspective is sector-specific character of innovations.

2.3 Concepts of industrial clusters and networks

LCPs are about how international companies can contribute into development of local companies, i.e. about inter-organizational relationships or networks. Different streams of research such as
economic geography (focus on location), international business (focus on MNEs) and organizational studies (focus on domestic firms) made contribution in the concept of clusters. The most influential contribution was made by Michael Porter in the field of strategy with a focus on competitiveness. This concept also became increasingly associated with the “knowledge economy” and innovative clusters. For example, Norton (2001) argued that the leadership of the US derives from the growth of clusters of innovative entrepreneurialism. MNEs often locate near other company in the same industry building an industrial cluster or the same country of origin building a country-of-origin agglomeration (Chang and Park, 2005; Nachum and Wymbs, 2005; Tan and Meyer, 2011).

Some clusters consist primarily of small and medium sized firms (such as for example Italian footwear clusters), other contain both small and large firms (German chemical cluster). There are university-centric clusters and clusters with no university connections; clusters of traditional industries or high-technology industries (Martin and Sunley, 2003). However, there is a gap in the literature in integration of these different streams of research when explaining how MNEs cooperate with indigenous industry in traditional and high-tech industries at the same time.

2.4 Value co-creation in networks

Value co-creation is a paradigm in the management literature which emerged from the service management field, innovation management studies, and marketing and consumer research (Galvagno and Dalli, 2014). The co-creation views states that suppliers and customers interact with each other for the development of new business opportunities. The marketing perspective considers the value co-creation as a network of interactions between actors, evaluating the available and potential resources to understand what they have and what they can do (Mele, Russo Spena and Colurcio, 2010). Purposeful interaction creates benefits – driving dialogue, learning, and resource transfer. Firms act as resource integrators, as specialization forces them to access existing knowledge, skills, competences, people, products, and available investment (Gummesson and Mele, 2010). According to the innovation and technology management perspective, the interaction
between customers and companies, which technological platforms often mediate, leads to innovation, customer participation, and improved customer services (Galvagno and Dalli, 2014). In our research, we focus on the information research and the service science strand on the theory of value co-creation, as it fits best with the context of our research with a focus on ICT service providers, and oil and gas companies as customers of services.

2.4 Impact of technology spillovers on local industry

International business literature says that foreign investments brings a package of capital, technology and management skills to the host country, including those in the form of spillovers. Spillovers (or externalities) are impacts on third parties not directly involved in an economic transaction, that is, when a transaction between A and B affects C (Eden, 2009). For example, agglomeration spillovers refer to the vertical (buyer-supplier) and technological spillovers that arise from clusters and networks; these impacts can be intra-industry or inter-industry (Dunning and Lundan, 2008). The empirical focus of research has been focused mostly on technological spillovers (Görg and Greenaway, 2004). Technological spillovers are informal, involuntary, non-market transfers (Eden, Levitas and Martinez, 1997). An example of agglomeration spillovers is knowledge spillovers generated by geographically clustered high-tech firms in Silicon Valley (Almeida and Kogut, 1999). Technological spillovers reprint differences between social and private impacts that are not reflected in market prices and can therefore generate inefficiencies and as a result, public policy intervention may be needed for market prices to reflect social costs and benefits (Eden, 2009).

The extensive literature on horizontal FDI spillovers (in the same industry) is inconclusive, the results shows that the presence of FDI seems more often than not to have no statistically significant productivity effects on domestic firms in the same (horizontal) industry — see, among others, Javorcik (2004). FDI-induced performance (or productivity) spillovers take place when local firms learn about new technologies, marketing or management techniques by observing foreign firm subsidiary (demonstration effects), by hiring workers trained by foreign firm subsidiary (labour market impacts), or by using
technologies shared by a foreign firm (technology-sharing impacts) and therefore improve their performance. Competition may also force a local firm to improve performance, however competition may also negatively affect local firm reducing revenue. For example, Aitken and Harrison (1999) and Javorcik (2004) demonstrated that FDI may have negative effects on the productivity of domestic firms within the same industry.

However, positive effects have been found in upstream industries and, as such, reflect supplier linkage effects rather than intra-industry technology transfer and learning effects. In general, an extensive literature confirms the absence of positive effects within the same industries and the presence of positive effects between industries (Görg and Strobl, 2000; Görg and Greenaway, 2004; Görg and Strobl, 2005; Javorcik and Spatareanu, 2008; Altomonte and Pennings, 2009). In the oil and gas industry, production linkages can exist along the same value chain (intra-industry), but they can also be inter-industry (horizontal). The later linkages are essential for sustainable development. The generation of new industries – whether these are support industries (such as banks, or transportation and logistics companies) which have multiple potential users across sectors, or horizontal effects that initiate new value chains in other, non-extractive sectors (Kaplinsky, Morris, and Kaplan, 2011). Returns from extractive sectors (which often refers to as ‘rents’) have the potential to create the basis for further economic activity in other (renewable) industries, therefore acting as driver for sustainable development. Inter-industry linkages create spillovers and generate new industries – whether these are support industries (such as banks, or transportation and logistics companies) which have multiple potential users across sectors, or horizontal effects that initiate new value chains in other, non-extractive sectors (Narula, 2018).

However, what is notably absent from the evolving literature is a strategic management view, i.e. a perspective that seeks to understand LC from the perspective of decision makers in organizations affected by this policy. Such a perspective is important, not only because it may provide decision makers with a better understanding of the strategic and operational trade-offs related to LCP, but also because it may inform policy makers about the strategies and interests of organizations, thus allowing them to design policies that are better aligned with their interests. The aim of the paper is to fill this gap.
3 Methodology

Case study is a research design that is adopted in this paper in order to explore the research question: at the strategic level, how do foreign and local oil and gas companies, as well as other stakeholders respond on LCPs? The case study is an appropriate method of research design for investigating a contemporary phenomenon in the real-life context, especially in the situation the boundaries between phenomena and its context are not clearly evident (Yin, 2009). There virtually no secondary quantitative sources of information on cooperative relationships between companies. Macro level data, such as for example, national input-output tables can only provide hints of such relationships or suspect among which such relationships can be organized. Literature shows that most of research that inform about industry links originate in case studies (Bergman and Feser, 1999). For data analysis the explanation building on analytical technique is used (Buchanan, Addicott, Fitzgerald, Ferlie and Baeza, 2007; Yin, 2009). This includes generating propositions or hypothesis about casual patterns and links for further investigation (Buchanan, 2012), but does not assume to generate hypothesis in its classical way, rather just general generation of ideas. This research is based on multiple sources of evidence: secondary data (records, companies and government documents reviews, press, legislative acts, etc.; primary data - 24 in-depths interviews with domain experts from the oil and gas industry; the academic literature on management, economic, and political dynamics in the oil and gas industry and particularly, local content policies. The interviews were conducted face-to-face or by Skype in 2016 and 2017 in Kazakhstan, United Kingdom and Dubai. The sampling of interviewee was done using a snowball sampling technique, where interviewed persons were asked to provide the names of the other people that could add a new perspective to research. The initial contacts were ensured during the conference on local content held in Kazakhstan in April 2016.

4 Case study

Kazakhstan had supported and developed local content in the oil and gas industry since the declaration of its independence in the 1990’s.
Recently, Government of Kazakhstan has also launched a “Programme of information and communication technologies development in the Republic of Kazakhstan in 2010-2014”, which has its aim to accelerate industrial development in Kazakhstan, and more specifically, transition of the Republic of Kazakhstan to information and innovative economy and formation of competitive, export oriented national ICT sector. This also assume development of local ICT capabilities (see Table 1 below). In order to implement integrated state policy in ICT, as well as state management of information and communication infrastructure, in 2008 there was established a joint stock company "National ICT Holding Zerde". According to Holding Zerde (Zerde, 2017) the implementation of the State Program “Digital Kazakhstan” will include digital transformation in the economy branches. It is the widespread introduction of digital technology to enhance the competitiveness of various branches of the economy.

**Table 1.** Local content targets and ICT technologies in Kazakhstan.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2009</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of Kazakhstani content in overall ICT market</td>
<td>7%</td>
<td>Not less than 32%</td>
</tr>
<tr>
<td>Share of Kazakhstani content in overall in IT</td>
<td>30%</td>
<td>80%</td>
</tr>
</tbody>
</table>

This research is based on the analysis of LCPs of Kazakhstani three major oilfield exploratory projects: Karachaganak Petroleum Operations (KPO), Tengizchevroil (TCO) and North Caspian (NCOC), company documents and 24 interviews with industry experts, managers and entrepreneurs. ICT procurement comprises also a part of procurement in the oil and gas industry, and therefore is a subject of local content regulation in the oil and gas sector. However, these two policies (in oil and gas and ICT sectors) are not synchronized, as local content policy in ICT industry is focused on this sector only, and investments and public-private projects target mostly ICT in public services domain.

Stakeholders of the local content policies and their activities are summarized in the Table 2 below.
Table 2. Stakeholders of local content policy in the oil and gas cluster in Kazakhstan.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major projects operators and major international oil and gas companies</td>
<td>To meet institutional requirements, develop local industrial base in order to procure for their projects; develop social infrastructure; present their requirements relating to goods, services and technology; provide information on their procedures, registration and vendor’s database, as well as the process of pre-qualification and tender requirements</td>
</tr>
<tr>
<td>Local engineering, constructors and service providers</td>
<td>Take part in the partnerships with international companies; upgrade their technological and managerial expertise</td>
</tr>
<tr>
<td>Foreign engineering, constructors and service providers</td>
<td>Perform design and engineering work on complex production facilities</td>
</tr>
<tr>
<td>Institutions of collaboration (associations, chambers, unions)</td>
<td>Represent interests of the local industry</td>
</tr>
<tr>
<td>Development agencies</td>
<td>Take part in development projects; distribute financial resources; analyze information</td>
</tr>
<tr>
<td>Government</td>
<td>Take part in development projects; provide financial resources</td>
</tr>
<tr>
<td>Citizens</td>
<td>Benefit from new jobs and knowledge transfer</td>
</tr>
</tbody>
</table>

5 Theoretical frameworks

For the purpose of this research we will introduce a definition of a cluster as network of interconnected international and local companies (including SMEs), specialized suppliers, service providers, firms in related industries, associated institutions (for example universities,
standard agencies, and trade associations), government and citizens that co-create value and develop local content through interactions and exchange of resources, technology and management skills with each other in the settings of certain local environment. In the case of clusters not only does the external competitive environment impact on cluster’s participants, but also the activities of those participants can impact back on that competitive environment. That external environment consists of the global markets for the good or services provided by the cluster, the various policy regimes (both national and global) that comprise the regulatory environment (such as standards, trade restrictions etc) within which the cluster operates, and competitors and collaborators in other clusters in the same or related industry (Martin, and Sunley, 2011).

Data can be analysed in a more systematic manner if the study is based on theoretical propositions or conceptual model (Graue, 2015). Investigation of theories that can be applied to the circumstances of the local content policy case at the level between industry and a company level has led to the selection on the following three theories: theory of competitiveness in clusters, value co-creation theory and spillover effects from FDI. Table 3 is underlying assumptions of these three theories.

**Table 3.** Selected theories that can be applied to the local content policy at network level.

<table>
<thead>
<tr>
<th>Theory</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitiveness in clusters</td>
<td>Clusters are groups of business enterprises and non-business organizations that lead to the high competitiveness Government create an environment in which companies gain a competitive advantage</td>
</tr>
<tr>
<td>Value co-creation</td>
<td>A company and its customers in the service network co-create value by sharing resources, tangible and intangible</td>
</tr>
<tr>
<td>Spillover effects</td>
<td>Foreign companies may have indirect positive effects on local companies</td>
</tr>
</tbody>
</table>
Conceptual framework represent itself the system of concepts, assumptions, expectations, beliefs, and theories supporting and informing the research conducted (Maxwell, 2013). Based on the value co-creation theory as guiding theory with elements from the other two frameworks a conceptual model of local content development has been developed (Figure 1). Zikmund, Babin, Carr and Griffin (2009) define propositions in qualitative data analysis as “statements concerned with the relationships among concepts. A proposition explains the logical linkage among certain concepts by asserting a universal connection between concepts”. Based on this model, we formulate the following propositions.

Theoretical Proposition 1: The role of LCP is to link the network of actors and facilitate value co-creation between them.

Theoretical Proposition 2: Value co-creation lead to ICT technological upgrade of the local industry through direct and indirect effects between international companies and local SMEs.
5 Conclusions

Given that indigenous development is in the interest of all stakeholders in the oil and gas clusters on one hand and importance of diversification from oil and gas industry in new technologies on the other hand, it is important to understand how strategic management theory can contribute in our understanding of interests of different participants and the role of technological upgrade through digitalization of the oil and gas industry. In this research, three different theories were applied in the context of a multiple case studies of interactions in order to explain how local content policies can lead to the technological upgrade and therefore improve organizational performance. Conceptual model of local content development suggests that in order to be effective local content policies have to support co-operation and value co-creation. Further research should explore how local development and digitalization of oil and gas industry can be linked and the role of digital technologies in this process. This research will have both managerial and theoretical implications, as well as will help policymakers to formulate more collaborative policies when aiming to support indigenous development. Rather than focusing only on specifying mandatory or quantitative LCP targets and thresholds for IOCs, a collaborative approach to LCPs is built on creating a supportive regulatory and business-friendly economic environment for international companies to deliver greater value in the host country. Under this approach, governments play a role in reducing regulatory and administrative barriers, providing fiscal incentives for IOCs to establish or support small and medium enterprises in the host country, and developing intellectual property rights to provide greater protection for domestically produced technology and innovations.

Under a collaborative approach, governments should work closely with IOCs to set realistic LCP targets, collect information and develop supportive regulatory and institutional environment.
References


