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GLOBAL VALUE CHAIN PARTICIPATION AND PROSPECTS
FOR LOCAL UPGRADING IN THE EGYPTIAN-CHINESE
ECONOMIC AND TRADE COOPERATION ZONE

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Abstract

This paper focuses on the global integration of economic zones for the movement of knowledge and technology. Using the case of China's Economic and Trade Cooperation Zone in Egypt, it examines the dynamics of coordinating global value chain activity in a foreign-operated industrial cluster highlighting two main determinants of achieving technological progress, industrial planning and institutional dynamics. The key question asked is whether a framework for the operation of economic zones that is controlled by lead economies can succeed in enhancing industrial competitiveness of domestic enterprises. As evidenced by this case study, the organisation of global production, including decisions relating to the choice of location, industry focus, vertical cooperation and shifts in value chain activity, is not determined endogenously within the chain but by the policy imperatives of the lead economy. The opportunity for domestic enterprises to participate in global production are strategically circumscribed by nodal firms that play a role in organising global production. The argument put forward is that accelerating GVC participation, fails to ensure the vertical move upward of domestic enterprises, and may counter the development of indigenous capabilities in the host economy.

Keywords: Industrial Organization, Production Fragmentation, Division of Labor, Manufacturing, Diffusion, International Transfer of Knowledge, International Transfer of Technology.

JEL Classifications: L230; O140; O330

ملخص

تركز هذه الورقة على التكامل العالمي للمناطق الاقتصادية لحركة المعرفة والتكنولوجيا. باستخدام حالة منطقة التعاون الاقتصادي والتجاري للصين في مصر ، فإنها تدرس الورقة ديناميات تنسيق نشاط سلسلة القيمة العالمية في مجموعة صناعية تديرها جهات أجنبية تسلط الضوء على اثنين من المحددات الرئيسية لتحقيق التقدم التكنولوجي والتخطيط الصناعي والديناميات المؤسسية. والسؤال الرئيسي المطروح هو ما إذا كان إطار عمل المناطق الاقتصادية التي تسيطر عليها الاقتصادات القائدة يمكن أن ينجح في تعزيز القدرة التنافسية الصناعية للمؤسسات المحلية. كما يتضح من دراسة الحالة هذه ، فإن تنظيم الإنتاج العالمي ، بما في ذلك القرارات المتعلقة باختيار الموقع ، والتركيز على الصناعة ، والتعاون الرأسي والتغيرات في نشاط سلسلة القيمة ، لا يتم تحديده داخلياً ضمن السلسلة ولكن حسب ما تمليه سياسة الاقتصاد الرئيسي. إن الفرص المتاحة أمام الشركات المحلية للمشاركة في الإنتاج العالمي مقيدة استراتيجياً من قبل الشركات المفصلية التي تلعب دوراً في تنظيم الإنتاج العالمي. وتتمثل الحجة المطروحة في أن تسريع المشاركة في سلسلة القيمة العالمية، لا يضمن التحرك الرأسي للمؤسسات المحلية ، وربما يتصدى لتنمية القدرات المحلية في الاقتصاد المضيف.

1. Introduction

In the past three decades Economic Zones (EZs) have emerged as a leading policy instrument for low and middle income economies to attract foreign investors and boost their world market share in manufactured products. EZs have long been central to the expansion of international trade, but with the increased ability of firms to expand spatially, they have come to serve the additional function of integrating geographically dispersed locations into a single market for producers (Banerjee-Guha 1997, 29). By implementing special administrative, regulatory and institutional frameworks that lower the cost of production, zones help manufacturing activities take root in new locations. (Dobrogonov and Farole 2012). For the host country, the anticipated benefits from agglomeration centre on generating productivity improvements in the domestic economy through the diffusion of knowledge and technology. In many cases however, companies that move production activities into EZs fail to enhance industry competitiveness among domestic producers and suppliers, as engagement occurs in a way that discourages higher value added activity (Milberg and Amengual 2008). Often, opportunities for improvement of national human capital and technical capabilities remain unrealised.

In examining how firms organising production on a global scale limit the vertical movement upward of domestic players along the value chain, two important dimensions of the value addition process have been identified; institutional dynamic and industrial planning. An empirical illustration of these strategies in the Chinese-Egyptian Suez Economic Trade and Cooperation Zone (SETCzone), is elaborated in this study. The analysis takes into account the positioning of power of the lead and host partners across the chain, specifically the power differentials between local actors and external partners. In the course of research the following themes have emerged. First, examining the zone's organisational system reveals that the disjunction between national institutions and differentiated regulations applied inside the zone weakens the structure of the state, decreases regulatory uncertainty and encourages rent-seeking behaviour. Coupled with an increased influence by multiple stakeholders over government machinery, the resulting environment of uncertainty greatly hinders the capacity of state institutions to plan effectively towards capturing the benefits of technology transfer.

Second in the scope of production planning, the concentration of decision-making with lead economies challenges the thesis of upgrading through technology diffusion. The agglomeration of foreign firms in economic zones should theoretically enable developing economies to source technology and develop local capacities or increase the degree of local content that goes into production. Such advantages are far from guaranteed however, as more often than not upgrading opportunities for host economies are heavily circumscribed by lead firms that are unwilling to compromise their competitive advantage (Ahrens and Meyer-Baudeck 1995). Specifically linkages that lead to the transmission of knowledge and technology are activated or blocked based on the competitiveness gains for Chinese firms from localising production.

With the aim of advancing a more nuanced and less hypothetical understanding of upgrading within clusters, the following discussion elaborates on these two important dimensions of the economic zone policy.

1.1. Methodology

The paper is structured as an individual case study in which the contextual particularities of the case are used to “highlight the generality of the processes” with which the research is concerned (Skocpol and Somers 1980, 178). The level of analysis is the cluster. GVC analysis is incorporated as a methodological tool to analyse interactions between nodal firms and their suppliers, with a focus on gaining knowledge at an intra-industry level in order to obtain insights into wider patterns of global value chain integration. The study selects 2 core industries in Egypt’s SETCzone, textile and heavy industry, because of their important strategic interest for Egypt’s main development partner in the zone, China, as well as providing a good cross section of operating environments. To obtain primary data the top three industries in each of the industry groups were contacted.

The analysis draws on the author’s field notes and interviews as well as on a literature review. The primary methods of data collection include in-depth individual interviews with key stakeholders, including government ministries, zone management and the business community. Other sources of evidence that are utilised include documentary sources such as texts of agreements, official publications and secondary data; and microanalysis, including observation and anecdotal evidence. The multiple sources of evidence converge in a triangulating fashion.

1.2. Paper outline

The paper is organised as follows. The following section outlines theoretical propositions to guide data collection and analysis, providing a framework for considering new economic patterns in which economically important enterprises are spread across multiple countries. It discusses in qualitative terms the impact of production disaggregation on economic and technological activity within bounded geographic spaces. The next section examines how these dynamics unfold within a distinct foreign operated industrial cluster that captures the nature of an increasingly interconnected and restructuring global context. A summary of the findings is presented in the final section. The appropriate appendices are included at the end of this paper.

2. Linking production on a global scale in cluster and value chain theory

Increased collaboration and networking among firms on an international scale has instigated a breakdown of production processes and the transfer the stages of production to locations that reduce the cost to customers (Maswood 2018, 138) In the course of technological advances and aided by lower interaction costs, the integration of world economies has occurred through the balancing of two forces (Baldwin 2013, 30). The first is dispersion, which occurs when companies locate different production stages across different countries through network of independent suppliers or their own affiliates. One of the main literatures focusing on interactions between suppliers and buyers, GVC analysis, gives attention to the

critical role played by powerful lead firms that ‘undertake the functional integration and co-ordination of internationally dispersed activities’ (Gereffi 1999, 41). Conversely agglomeration forces encourage geographical clustering of interconnected firms in a particular field. The literature on clusters deemphasise global linkages, instead focusing on interdependent relationships within a locality (Riedel 2009, 4). Deriving from cluster research are studies on economic zones, analysing the concentration of production activity in discrete geographic units. This literature examines how locational benefits, specialised infrastructure and unique economic regulation facilitates interfirm collaborative activities, leading to the emergence of supplier networks in the cluster.

Both research agendas point in the same direction: relationships between foreign-owned firms and local suppliers of specialised inputs are an effective way to transfer technological knowledge and advanced capabilities. The GVC approach posits that incorporation into global markets offers domestic firms the opportunity to acquire capabilities in new industries through vertical linkages. Lead companies constructing and managing international production networks begin by transferring functions to a third party in the host economy and gradually end up separating the functions completely (Raskin and Mellquist 2005, 4-5). Domestic enterprises eventually become key providers of products and services to multiple customers at a lower market price, achieving greater economies of scale (Raskin and Mellquist 2005, 4-5). GVC analysis treats outsourcing and offshoring as indicators of production disaggregation, implying the inevitability of progressing through these stages in support of the argument that endogenous means of upgrading exist in the verticality of the value chain (Roy 2014, 2).

This thesis appears problematic in the case analysed in this study in two ways. First, the process of deverticalisation is often resisted or applied selectively by lead firms whose objective is to retain competitive advantage. Evidence from SETCzone enterprises indicate that the allocation of tasks to domestic suppliers is limited and therefore so is actual production experience, as production is owned and controlled by lead firms. In cases where joint production occurs, the lead companies determine strategically what functions to contract out to domestic firms. As a result deverticalisation fails to boost the development of indigenous technological capabilities. As Morrison et al. note, “Global buyers have indeed a clear incentive to keep their suppliers dependent on them and not to disclose their core competencies, and accordingly to discourage their attempts at developing strategic competencies” (Morrison et al. 2008, 160).

Similarly, cluster literature emphasises the transmission of capabilities from FDI firms to domestic enterprises, but highlights interaction on a firm-to-firm level as a key driver in the transfer of knowledge, business practices and technology within agglomerations of linked industries. The complementary nature of activities in the locality is supposed to support vertical and horizontal co-operation between participating businesses through active channels of business transactions and knowledge transfer (Riedel 2009, 4). In cluster literature however links of local-cooperation to the external world are weakly theorised, and little attention is given to the relationship between lead firms located abroad, their overseas

affiliates and collocating domestic industries (Humphrey and Schmitz 2002, 3). It is important therefore to recognise that where producers located in a cluster operate in global value chains, decisions made within the chain affect how activities are coordinated in the locality, and this has consequences on opportunities for local-level upgrading (Humphrey and Schmitz 2002). It is equally vital to consider in analysing the coordination of vertical linkages, the role of interests, opportunities and the power dynamics regulating these relationships.

A proposed research agenda treats clusters as a key organising principle in the coordination of vertical linkages, as locally bound networks constitute an important part of the chain (Humphrey and Schmitz 2002; Porter 1998; Riedel 2009). A cluster approach is chosen as the main tool to determine the impact of local potentials on the coordination of economic activity in the zone, and is complemented by GVC contextual framing for its effectiveness in explaining external links to the market chains in which clusters operate. Of key relevance to this research is the constitutive role of power asymmetries between firms in host economies and their industrialised partners in determining opportunities for upgrading and accumulation. Joint production occurs in the context of relationships that are very uneven, with powerful private sector actors, governments and international institutions enjoying considerable advantage in determining “how financial, material, and human resources are allocated and flow within a chain” (Gereffi 1994, 97). The relative position of actors in the chain is determined by historical and political processes that define the flow of inputs, outputs and gains within the cluster, a dimension that rarely gets captured in standard cluster or GVC analysis (Roy 2014, 5). This raises the question of how independent local producers actually are in their ability to acquire knowledge and generate innovative production within the framework of global production.

3. Global market integration and the movement of knowledge and technology in Egypt’s SETCzone

Having evaluated the broad theoretical landscape on globally linked clusters, this section takes a closer look at the features of the Chinese-Egyptian SETCzone in relation to the preceding discussion. The SETCzone is a manufacturing-oriented industrial park located within Egypt’s Special Economic Zone (SEZ) along the Gulf of Suez and subject to the SEZ investment regulations and special provisions. It was established as an experimental zone policy that includes many of the elements of ‘free zones’ while incorporating discriminative features supporting its role as a nodal point in networks of globalised production. Technically the SETCzone is a joint venture between the governments of China and Egypt though in all respects it is an initiative of the central government of China aimed at increasing the entry of Chinese firms into the Egyptian economy and regional markets. Development and management responsibility lie mostly with the zone’s foreign developer, Chinese government-owned Tianjin TEDA Co. The zone relies on investments almost exclusively from Chinese parties, therefore the majority of manufacturing facilities are owned and controlled by Chinese enterprises. Sectoral orientation is based on achieving greater efficiency in markets for Chinese firms, and near complete administrative autonomy ensures that participants enjoy investment conditions favourable to their needs. At present the

SETCzone is the only industrial area in Egypt with independent comprehensive support facilities for the entry of investors, enhancing its status as a self-sufficient, functionally integrated global production structure embedded in Egypt's national territory.

The diversification of production in the SETCzone, ranging from heavy industry involving higher capital intensity, to low-skill assembly-oriented activity aptly reflects contemporary developments in the global production and trading system. While in the past firms channelled their investments into locations with an existing industrial base, the relative ease of sourcing from the global market has decreased the need to find locations that specialise in similar activities or for firms to rely on a local supplier base. The transition towards specialising in a fraction of the production process further reduces the benefits of traditional sectoral targeting (Maswood 2018). Instead, priority is given to countries' ability to leverage their locational advantages and embrace pro-investor policies. Economic zones have emerged as an ideal policy to achieve these conditions, helping firms to capitalise on land, labour and geographic proximity to target markets and trade routes, all important competitive differentiators in the global economy. In this context, investments are determined by the SETCzone's unique characteristics which draw commercial partners in a range of sectors. The following section examines the determinants of the zones industry focus in greater detail.

3.1. China's Economic and Trade Cooperation Zone in Egypt: Background and objectives

China is fast emerging as the new industrial workshop to the world with a manufacturing output in 2017 larger than that of the next four countries combined, surpassing the United States as the world's largest trading nation in recent years. Fuelling the country's rise in global trade has been a growth in low-cost Chinese exports to advanced economies, a trend that has accelerated rapidly but which may witness a reversal as labour and land costs continue to climb amid decreased global demand and slower growth. In recent years, Chinese Foreign economic policy has largely been centred on a strategy of opening new markets for Chinese goods and services, building up Chinese brand names and ratcheting up overseas foreign investments in order to combat a potential slide (Brautigam and Xiaoyang 2011, 70). China's overseas zone program has been a key instrument in furthering these aims, helping to develop its economic ties with existing and new partner economies across the world. Between the mid-1990s and 2006 China succeeded in establishing up to 50 special economic cooperation zones in other countries helping Chinese firms to access natural resources, key trade routes and previously untapped markets (Brautigam and Xiaoyang 2011, 70). Increased economic integration with developing countries has been facilitated by China's growing political and economic influence as a provider of international development, which is a central pillar of China's comprehensive economic-foreign policy strategy known as the Go Global agenda.

Go Global was introduced in 2009 to move China's production capacity offshore. Primarily it targets the expansion of overseas investments in low-level manufacturing to free up domestic resources to be deployed in newer innovation. The strategy is focused on increasing the value-added of Chinese trading goods while helping China gain a larger

percentage of value chains it currently controls by moving closer to its customer and supply bases abroad and increasing the competitiveness of its firms (Tianjin Commission of Commerce, 2011). Currently less than 20 percent of the value chain profit margin is captured by the Chinese manufacturer while design, downstream distribution, marketing and end-customer support ends up capturing the remaining 80 percent (Jie 2012, 34). Channelling overseas investment to Chinese production bases in cost-saving locations emerges as attractive possibilities for Chinese firms, including state-owned enterprises to improve competitiveness in existing industries while relieving the saturated domestic market. Hence, contrary to the strategy of domestic Chinese zone programs to increase linkages between local firms and zone companies, the core of Chinese offshoring to weaker developing countries is to support retaining existing capabilities by moving the manufacturing bases that support them abroad (Jauch 2002, Wade 2015).

Notably, the African continent is a key focus of the Go Global agenda with five countries favoured by the Chinese government to host economic zones. In 2007 industrial park developer Tianjin Investment Holdings (TEDA) was appointed by the Chinese government to develop an Economic and Trade Cooperation Zone in the third sector of Egypt's 223 km² SEZ in the Suez Canal area SEZ (SCzone), directly adjacent to the port facility of Ain el Sokhna. TEDA, a subsidiary of the Tianjin Municipality in China, established Egypt TEDA Investment Company, a country-based parent brand of industrial zones to develop the SETCzone as its first project on 1.34 km² of land. To aid manufacturers in their move offshore the Chinese government established the China Africa Development Fund (CADFund), a government venture capital instrument focused on developing industrial parks. CADFund became a major shareholder in the SETCzone in 2008. Together CADFund and Tianjin Investment Holdings control of 75 percent of Egypt TEDA's shares (a further 5 percent is owned by a company controlled by Tianjin TEDA), making the SETCzone a Chinese state-run project. Additional sources of monetary support include assistance from the Chinese Ministry of commerce to subsidise preconstruction and implementation costs as well support offered to firms through special funds; funding from the Tianjin regional government and low-cost finance and equity participation offered to firms by Chinese policy banks such as CDB and Eximbank. With the support of various governmental actors significant investment has been made in four main priority sectors in the SETCzone, textiles, fiberglass, machinery and electrical equipment.

The greatest incentives for Chinese firms to move into the SETCzone relate to locational advantages allowing firms to minimise transportation and input costs. The Suez Canal is one of the world's principle maritime routes capable of connecting Chinese manufacturers to markets in the transatlantic trade areas covering the northern, southern, and eastern Mediterranean (Scott 2013, 24). Companies trading in West African and North American markets save distance, time and operational costs associated with long distance maritime transport by travelling through the canal. Alongside trade route connectivity the SETCzone's location allows China to guarantee its presence in the global energy market as the country's oil strategy moves towards foreign imports particularly from the Middle East. Between 2002 and 2014 oil imports jumped from under 2 million b/d to 6.2 million b/d with approximately

two-thirds of these supplies originating in the Middle East and Africa, and overall demand is set to rise in the coming decades. Egypt plays a vital role in international energy markets through oil production and exploration in the Deepwater Mediterranean Sea off Egypt's coast as well as the operation of the Suez Canal, which offers ease of access to the region's oil and gas wealth and a transit route for oil and liquefied natural gas (LNG) shipments traveling to East Asia (EIA). Chinese petroleum equipment manufacturers such as the Egyptian Petroleum HH Rig Manufacturing Shareholder Co. (EPHH), and the International Drilling Materials Manufacturing Company (IDM) benefit from proximity to oil and gas production firms. Currently, the biggest Chinese investment in Egypt is Sino-Tharwa Drilling Company, a joint venture operation that provides overseas oil and gas engineering services, with increasing opportunities to invest in petroleum sector facilities.

Additionally, compared with domestic Chinese and other overseas industrial parks the cost of energy, transportation and labour is lower in the SETCzone, as production elements are made available to investors at a reduced cost (China-Egypt TEDA). Fuel prices are fixed at rates far beneath the special rates offered to investors outside the zone (Total 2018). Overall, main production elements and Egypt's tax burden cost approximately half of China's according to comprehensive statistics (China-Egypt TEDA). Additional benefits of the zone's special investment regime include ease of access to international markets using Egyptian certificates of origin. Access to this policy allows Chinese firms to take advantage of Egypt's international trade deals, securing their access to markets in the US, EU, Turkey and other countries in the MENA region free of custom duties and other non-tariff barriers.

As part of its expansion strategy the Chinese government has encouraged firms to act aggressively to acquire resources, enhance brand promotion and increase exports in the region, offering additional monetary and political incentives to support companies to go global. Thus far the zone's 1.34 starting area has succeeded in attracting 32 manufacturing enterprises and 32 service-oriented firms at a total contractual investment of \$1 billion (Egypt TEDA 2016 Development Report). As a total share of Chinese OFDI, the percentage accounted for by the SETCzone is relatively modest, but at a capital intensity level of \$700 per square meter, the relative amount of industrial capital it has attracted is higher than in the Chinese Tianjin it was modelled after. This has motivated plans for the expansion of the zones production capacity with TEDA in the process of laying the infrastructure for a 6km extension expected to accommodate 200 enterprises worth \$3 billion in investments (Tianjin Commission of Commerce 2016).

3.2. Industrial structure

Data on production organisation gathered directly from six SETCzone investment projects in the heavy industry and textiles sectors reveals that inclusion of local producers into the value adding process is either restricted or heavily controlled. Secondary information obtained on the activities of various other enterprises in the cooperation zone supports this conclusion. Decisions about inclusion or exclusion of suppliers is associated with the lead firm within the GVC approach, and is based on locating the most cost-effective products and services produced by third parties on the open market (Riedel 2009 37). For lead firms in China

looking to reduce the cost of production, having a subsidiary or affiliate based in the zone allows them to achieve greater efficiency in markets, without needing to rely on the complementary competencies of local suppliers. Chinese enterprises, remain the dominant, if not exclusive providers of fulfilment services within the chain. This dynamic is not spontaneous, nor is it determined within the chain. Policy decisions by the Chinese state to utilise commercial actors for strategic purposes related to internal development have a clear impact on coordinating activities in the chain. Market power asymmetry allows the Chinese state to exert its influence through the zone's flexible regulatory framework to structure business relationships in favour of Chinese investments and restrict market access for domestic enterprises. This ensures that "profits, and hence resources for innovation and growth, gravitate to points of concentration on the value chain". The cluster context thus creates the conditions that enable lead firms to retain control at various stages of the supply chain using two main strategies: maintaining the vertical integration of firms and actively blocking capability transmission:

3.2.1. Maintaining the vertical integration of firms

The strategic geographical advantages of the Suez corridor enable Chinese enterprises to generate enough revenue from offshoring production to keep international expansion within the firm rather than licencing to local contract partners. A firms' ability to retain non-core functions internally is an indicator of achieving internationalisation advantage, referring to the ability of a principle firm to operate from different markets cost-effectively in support of gaining multinational status. Multinational production is a key objective of Chinese planning authorities as a way to enhance the position of the Chinese economy and increase the competitiveness of Chinese name brand in global markets. This objective is behind the establishment of the zone's five heavy industry megaprojects, Jushi Egypt, International Drilling Material Manufacturing Co. (IDM), MUYANG, Egyptian Petroleum HH Rig Manufacturing (EPHH) and EGYMAC, as well as the 20 SME's supporting the supply chain of firms in the Chinese national economy. In the case of large corporations, the majority of their inputs are sourced from China. Most are upstream suppliers with massive fixed-asset instalments that seek to achieve economies of scale by directing their product flow to regional markets. SMEs are small-scale downstream suppliers that finish or assemble products for local distribution, enabling Chinese domestic enterprises to operate abroad while efficiently retaining complementary competencies in task-based production, marketing, logistics and distribution in house.

A combination of approaches that see some chains cutting across more than one country and others ending in the SETCzone is encouraged, as pressures in different industries push firms towards different strategic imperatives and markets. In both patterns of cross-border production however the key organising principle is intrafirm collaboration, a strategy that supports China's national industrialisation and development objectives. As final output generators, SMEs in the textile sector for example link Chinese manufacturers to Egyptian markets. They provide assembly services to the main manufacturing supplier factory in China and direct access of products to consumers through domestic traders, wholesalers and retailers. Factories such as single-brand blanket manufacturers Linye and Ya Ou, and scarf

manufacturer Tianjin Egypt-Yashmagh Textile Co., (which have investments of \$2.5 million, \$0.8 and \$1 million respectively) remain vertically integrated with their parent firms, importing most of the primary commodities used in production such as fabrics and yarn. Linyi's parent firm, for example, is an integrated textile factory that includes fabric and yarn mills, printing, dyeing and design services, and which is the source of all of the companies input needs. Internationalisation supports capacity building of such firms for the export market with the potential for small and medium enterprises eventually become significant brands and chain leaders themselves with a role beyond supplying inputs for the global supply chain.

In heavy industry the International Drilling Material Manufacturing (IDM), a company with investment valued at \$39 million, produces casing and tubing used in drilling and pipeline equipment by adding value on semi-finished steel pipes imported from China. It sells its merchandise to international oil companies active in the Suez Canal and the Mediterranean deep water. Similarly Jushi Egypt, a \$58 million subsidiary of the world's second largest fiberglass manufacturer Jush Group Co. LTD, largely produces for export. 80 percent of Jushi's annual output capacity of 200 000 tons is exported to Europe and the Middle East, while 20 percent is sold in the local market. Some chemicals are supplied domestically but the majority of raw materials required for production come from China, in addition to sourcing inputs from two Chinese companies which have entered the zone specifically to supply Jushi with material. Jushi in turn is a supplier to Hengshi Egypt Fiberglass Fabrics, a smaller fiberglass company with a total \$10 million investment (Egypt Hengshi).

The benefit to Jushi from the complementary and synergy effects that arise in clusters is from engaging Chinese rather local input suppliers, demonstrating how the choice of participants in locally bound production is directed by decisions made at higher levels in the chain. Excluding local specialised suppliers may relate in part to the capacity to provide goods or services at a high degree of specification and customisation, but more broadly it represents a manifestation of a more general competitive objective, developing value networks of Chinese firms that save having to rely on external suppliers when economically feasible. For functionally integrated firms, therefore, coordination within the chain is motivated by more than just traditional commercial objectives, and reflects the imperative of Chinese managers to develop processes that increase the business and market share of Chinese companies as a whole (Yu and Evenett 2010, 18). This leaves minimal opportunity of engagement with the local economy, no spill overs accrued to local firms, and little potential for domestic upgrading, given that domestic competition in serving multinational companies is suggested as the main source of technological upgrading in the chain (Scott 2013, 26).

3.2.2. Active obstruction of capability transmission

The concentration of labour-intensive industries in the SETCzone is closely identified with the strategy of rebalancing China's economy towards higher value-added production to keep up with changes in demand and technology (Yu and Evenett 2010, 18; Brautigam and Xiaoyang 2011). As pressure to compete with imports grows China can free up resources to develop more advanced manufacturing capabilities by offshoring traditional sectors to

developing countries (Yu and Evenett 2010, 8). A substantial preferential policy applied to companies established in the SETCzone is flexible labour regulations “according to terms simpler than those generally prevailing under the Egyptian Labor Law” (Special Economic Zone Law 83/2002). Utilising this policy empowers employers to extract the highest productivity per worker, supporting the offshoring of low-skill labour-intensive Chinese manufacturing industries. Alongside weak labour protections, labour costs are low, making it more cost-efficient for investors to employ capital-saving production, and further lowering the technology level of FDI received in the SETCzone. Textile enterprises for example are characterised by low fixed asset investment despite the introduction of technological advancement into China’s textile industry, including the use of computerized systems and more automation in production. In tasks like stretching and cutting (which are semi-automated), sewing, and packaging, value addition is largely based on manual labour with little impact on building up a skilled labour force.

A variety of approaches exist however and relatively higher complexity industries invest more heavily in modern technology. High-voltage electrical transmission equipment manufacturer XDEGEMAC (jointly owned by Chinese state owned enterprise China XD with 51 percent of shares and the Egyptian state owned Egyptian-German Electrical Manufacturing Company EGEMAC with 49 percent of shares) produces Gas Insulated Metal Enclosed Switchgear (GIS) and high voltage power transformer, components that are used in the development of power plants. The main components of GIS, circuit breakers and isolating switches, are imported and assembled in the plant while insulator tubes that contain a type of gas that can be sourced locally are produced on site. The production of transformers on the other hand is highly localised. 60 percent of transformer inputs such as steel structures, conductors and copper bars are purchased from local vendors. In the face of rising competition, localising heavy production in electrical equipment manufacturing provides Chinese enterprises with scope for cutting retail costs in order to compete with companies from Europe, Japan and South Korea, who dominate the switches and transformer market (Du, 2014). Production requires a critical minimum production scale to be economically viable, and costs are made significantly lower by relying on parts and components from the domestic market, allowing the firm to maintain and increase competitiveness.

Within the arms-length market relationship between XDEGEMAC and local suppliers the low complexity of domestic components keeps buyer-seller coordination requirements, as well as transaction costs relatively low. There are few product performance standards to be met, and the buyer’s requirements can be met by a number of firms so they may easily switch to new sources of supply to reduce costs. In chains characterised by market relationships upgrading prospects for component manufacturers are found to be lower and generally are not fostered by the global buyer (Humphrey and Schmitz 2002, 9).

Alongside local sourcing the second localisation strategy utilised by the Chinese company in this instance is co-ownership. Partnering with a local firm should on paper create the potential for more customised and complex exchange according to supply chain logic,

particularly as EGEMAC also specialises in producing high-voltage electrical transmission equipment and transformer. This would be the case if EGEMAC was involved in the operation of the plant, but policies that control the total manufacturing system including plant management, work force practices, procurement, logistics, production patterns, and delivery of machinery and production technology are handled by XD. EGYMAC contributed its share of the capital costs in land and benefits from shared returns, but otherwise there is no form of inter-firm exchange or collaboration with the joint venture plant, necessary elements for firms to absorb, adapt and create technology. In-house technical training increases the skill level of workers and provide adequate technology know-how on more advanced production, but skills in heavy instalment sectors not easily transferable, and therefore have limited impact on generating new activity.

Leveraging its position as an enterprise of the Ministry of Electricity and Power EGEMAC profits from the relationship in other ways by taking on the role of gatekeeper to the Egyptian market. EGEMAC's stake in the joint investment puts XDEGEMAC in a position to receive preferential treatment in the awarding of government tenders in view of the relationships of favouritism between Egypt's political authorities and state owned enterprises (SOEs). Since XDEGEMAC's establishment in 2013 the ministry has been its sole client, signing various large contracts with the company to implement power plants and transformer stations across the country. As Egypt moves to lift electricity subsidies completely in the next five years profits will increase in the industry, spurring the demand for electrical transmission equipment and transformers. The joint venture functions as a quid pro quo exchange that generates economic rents and keeps a government entity active in big projects that it could not have implemented independently at the required level, while opening lucrative opportunities for the Chinese firm in the country's power sector that would have been difficult to penetrate by foreign owned firm.

3.3. Institutions and decision-making

As a bridgehead for Chinese exports to domestic and regional markets the SETCZone is an example of the role of local potentials in determining the source and volume of international capital flows. It also reflects the shift away from traditional locational concern regarding the spatial distribution of key inputs and raw materials, which have come to matter less with the increased ability of firms to mitigate input-cost disadvantages through global sourcing (Porter 1998, 78). Geographical determinants of competitiveness such as availability of natural resources and efficiency in sourcing remain a strong source of competitive advantage, but competition in a globalised economy has become far more dynamic. Increasingly value is placed on the availability of a business environment that enables companies to make the most productive use of variations between factor markets across countries and regions (Howells and Wood 2017; Porter 1998). Economic zones are often implemented to fulfil the function of facilitating the concentration and improving the performance of geographically dispersed firms. This is achieved through the provision of powerful incentives, specialised institutions, proximity to related businesses, access to customers and key trade routes and differentiated human capital.

Cooperation between actors at various scales facilitates the delivery of incentives within a special governing framework that ensures flexibility in providing companies with a tailor-made business environment, allowing them to maximise the potential benefits of the location. Authority is transferred from the national government to private developers, individual entrepreneurs and Chinese governmental actors in the lead economy, facilitating economic integration and ensuring rules and regulations are more adaptable to the requirements of investors. The process of decentralisation requires changes in the roles and responsibilities of actors and institutions within the established system of domestic economic governance. The process of rescaling state powers creates new organisational capacities, which constitute “decision spaces” (such as finance, management, service provision and personnel control) where external actors or agents are allowed a “range of effective choice” (Torrison et al. 2007, 4). The decision space concept encapsulates both functions and degrees of choice over which above and below-state actors exercise power. A single decision space may be shared across jurisdictions, acting as a platform where access and influence are negotiated, sometimes outside formal institutional arrangements. The paper highlights three broad and interrelated decision-spaces where power is negotiated and foreign influence is exerted in the SETCzone: regulation, finance and administration. Using this framework, a new concept of decentred decision-making arises that avoids treating decentralisation as a single transfer of a block of authority and responsibility to a certain entity (Torrison et al. 2007, 4).

3.3.1. Regulatory control

On paper the SETCzone’s regulating authority, the General authority of the Suez Canal economic zone (SCzone) is responsible for developing policies for investors, coordinating with the developer and managing all other aspects of the zone’s investment system. The SCzone authority is considered an independent entity and is tasked with handling matters relating to taxation, international trade and administrative incentives in accordance with the Special Economic Zone Law 83/2002 and the Investment Guarantees and Incentives Law 8/1997. In practice however, the authority operates with direct guidance and monitoring from higher levels of government. This is evident first and foremost from its authority structure. The SCzone governing body, its board of directors (BOD) is appointed by the Prime Minister and includes several high-ranking government officials. Among them are three to six ministers, a representative from the ministry of defence, and a representative of the Suez governorate, in addition to financial and legal experts from both public and private sector. The SCzone chairman is appointed directly by the president. The extent to which the BOD can act as an independent body is further constrained by the power afforded to “sovereign” cabinet ministries of defence, interior and finance to veto BOD decisions. The decision-making power of the SCzone therefor exists on a continuum from no to full decision-making authority depending on judgements made by higher level bodies.

Centralised decision-making is necessary to ensure that the BOD follows planning and policy-setting determined directly by the Egyptian central administration while granting state authorities greater flexibility in applying rules and regulations without the risk of generating conflict. Often, decisions are guided by a calculation of costs such as expanding earnings or ensuring that privileges offered to investors are leveraged to increase the value of income

generated from the activity of Chinese firms in the zone. Screening of foreign investments for example is a task of the BOD but has in the past been conducted directly between Egypt TEDA, acting as a conduit for the Chinese government, and the head of the Suez Canal Authority (SCA), a regional governmental economic and port authority. Using its clout the SCA is able to extend preferential treatment to investors handpicked and presented to it by the Chinese government through negotiations that exclude the BOD. In a second example of the flexibility offered by centralised decision-making, the special customs and tax administration system established by the BOD initially stipulated a tax rate of 10 percent on net income, until the Ministry of Finance unilaterally mandated an increase to 20 percent. The initial rate was to the detriment of the revenues of the sales tax authority, and state authorities soon realised that they stood to miss out on a major source of rents from the zone. The proceeds from taxes, transit fees (which also experienced hikes) and other earnings are not reinvested for the development purposes but directly accrued by the state in the form of rents.

Similar observations can be made elsewhere in instances where a central agency is empowered to override the SCzone's institutional authority to secure direct revenue. But while Egyptian authorities may use less critical policies such as red tape, tax administration, subsidized utilities and rental rates to increase their own leverage, "core" policies remain untouched at the risk of triggering an outflow of Chinese investments. The latter include standard free zone incentives such as duty-free imports of raw material and intermediate goods needed for production; access to the domestic market without export performance requirements; dispute settlement and a single point authority for investor services; and access to Egyptian certificates of origin allows them to make use of Egypt's international trade deals, granting easy access to EU and MENA region markets. Meanwhile, flexible or "soft" regulation is equally beneficial as a strategy to compensate and appease investors by bending regulation in their favour. One example is waiving the quota of Chinese exports to the domestic market, set by the SEZ law at 10 percent. Another is an agreement reached between Jushi and SCzone to waive a 10 percent foreign employee quota, increasing the number of Chinese employees to 16 percent of the company's payroll in lieu of training local employees (it is unclear whether this agreement was implemented).

Hence, in defining the decision space for regulation there is a need to consider that it is not just policies, legislation and formal institutional arrangements that influence the functional area of regulation, but various processes and relationships guided by China's economic and policy imperatives, and furthered through informal coordination channels and political negotiations. The government is able to use its legal authority and tools inherent to its sovereign control over regulation to increase the range of choice offered to Chinese actors for gains that are proportionally marginal, and often at the expense achieving any meaningful performance target for Egypt. China's export income from the zone amounts to \$150 million while taxes paid to Egypt are in the range of \$22.5 million in a partnership where there is a clear lack of intent to create an environment for the transmission of new processes and technologies (Tianjin Commission of commerce 2016). Overall, limiting real power of authorities in the host economy to influence decisions not only adversely impacts the

supposed attainment benefits from market integration, but increases uncertainty in the economy, creates an unpredictable regulatory climate and weakens investment policies and institutions in the long term.

3.3.2. Finance

The initial investment in the SETCzone project was made by Tianjin TEDA, a subsidiary of a regional government in China, using its own capital with a small participatory stake by a consortium of Egyptian SOEs, the Egyptian Chinese Company for Investment (ECCI). ECCI's responsibility was limited to providing off-site infrastructure such as link roads, and services such as extending water, electricity and power lines, whereas TEDA took on construction of the zone's infrastructure, buildings and roads, and the provision of sanitation and utilities through Public-Private Partnerships (PPPs) and Build-Operate-Transfer (BOTs) contractual arrangements (El-Gohari 2010, 25). By the time construction began CADfund, an instrument of the central government of China, had signed an agreement with TEDA to invest in the zone which led to the establishment of Egypt TEDA, the zone's main developer. Additionally, the zone receives political backing from the Ministry of Foreign Affairs and the Ministry of Commerce (MOFCOM), and benefits from subsidies issued by the Ministry of Finance (Scott 2013, 7). Equity financing and support from government bodies places Egypt TEDA at the helm of planning outward investments and guarantees support for future projects to expand or replicate the Suez model elsewhere (Scott 2013, 30).

In addition to financing the zone's developer, the government provides extensive support to financially profitable enterprises and viable investments as a second strategy for increasing the concentration of Chinese financial capital. CADFund exerts its influence by targeting specific industries for Chinese investments. Tianjin municipality heads a leadership panel for the SETCzone, under which the Tianjin municipal State-owned Assets Supervision and Administration Commission promotes SOEs to invest in the zone, and the Agriculture Committee and the Construction Committee promote investment by agricultural enterprises and construction materials firms (Brautigam and Xiaoyang 2011, 88). Other resources offered to relocating firms, including subsidies, rebates, finance, and equity participation in productive investments have helped enterprises extract greater profit but have also ensured that occupancy in the zone is almost exclusively Chinese (with the exception of three joint ventures established with Egyptian SOE) by increasing participation rates early on, despite the zone being open to domestic and foreign investors. The level of financial commitments by the Chinese government supports the perspective of the SETCzone's economic and diplomatic significance as part of China's overseas expansion. Its primary mission is to implement a state-led strategy designed to achieve certain levels of export value growth under vocationally specific conditions of production.

Based on lessons from earlier zone experiments however the aim is for the SETCzone to eventually operate independently with the Chinese government playing only a supportive role (Brautigam and Xiaoyang 2011, 82). To avoid the potential for underperformance and improve its financing capacity for future growth Egypt TEDA's business model entails developing for profit. Selling developed land originally obtained at below market cost is an

important source of revenue and is facilitated with the help of low-cost finance to companies from Chinese policy banks (China Development Bank or China Eximbank) or venture capital instruments like CADFund (Brautigam and Xiaoyang 2011, 82). An on-site comprehensive commercial services centre provides an additional source of revenue, while helping to increase the zone's ability to function independently of its local setting. The centre contains banks, restaurants, a commercial unit, office buildings rented out to businesses in the zone, a 7-floor four-star hotel, residential units rented out to employees from within and outside the zone and leisure facilities including amusement parks and sports facilities. The company also owns a production area containing warehouses and hangers that are rented out to SMEs and large industries. The earnings received by the developer are used to cover the SETCzone's running costs or reinvested for further land exploitation.

In summary, heavy Chinese capital expenditure coupled with the absence of a significant role by Egyptian partner in bringing in capital, machines and materials allows Egypt TEDA to monopolise all aspects of the zone's assets and facilities. The respective rights, responsibilities, and obligations relating to the zone's financial management including budgets, spending and revenue creation are defined by the agreement on commitment of funds. Having provided the land ECCI (which also includes TEDA as a partner) receives a portion of the profits from its sale according to its share of the original investment. Once profits have been reimbursed to the Egyptian party the land belongs to the investor, depriving the Egyptian partner of optimum rent on prime land or a role in its development. The Egyptian partners' role is thus as a contract partner with the role of partially implementing development projects for the foreign investments through the provision of external infrastructure.

3.3.3. Administration

The central government of China initiated the SETCzone with Tianjin TEDA as an implementing partner, following a Chinese model of zones that are centrally planned but company developed and operated. As Tianjin TEDA's overseas affiliate Egypt TEDA assumed administrative responsibility for the site after construction was complete relying on a professional cadre of Egyptian employees in a variety of managerial, marketing, sales and administrative roles to manage day-to-day operations. An administrative apparatus that is highly localised is of key importance for Chinese developers operating in an international context to assist in coordinating with local institutions and conducting business transactions. The internal system is nonetheless strictly governed by Tianjin TEDA, which handles coordinating with Chinese stakeholders and is responsible for the majority of investment activity through its sales and investment attraction department. Egypt TEDA is handed the responsibility of implementing agreements negotiated in China after the initial investment proposals have been sanctioned by Tianjin TEDA. This includes negotiating the terms of contracts with investors, helping them to establish their projects, facilitating customs clearance and land registration, and ensuring on-site service provision such as security, maintenance, and sanitation.

Guiding and monitoring the zone's performance is achieved in a hierarchical, top-down manner where in every department each level of management is upwardly accountable to the next in a chain of command that ends with decision-makers in China. A separate flow is created for each of the departments -asset management, investment attraction, HR, legal, financial and brand management- to increase efficiency. The head of each unit in Egypt TEDA answers directly to a corresponding department in the company's headquarters in China using a company management information system that enables real-time transfer of feedback and data.

The supervision and control exerted by the main company have a limiting influence on the decision space afforded to managers and personnel based in Egypt and firmly establish administration as a function of the Chinese partner. The IT platform is systemised to detect changes, delays and irregularities in the flow of approvals if coordination between departments locally is required when concluding contracts or agreements, triggering an inspection by the main company with any change to the workflow. It is also designed to block fulfilling agreements by the Egyptian CEO if they exceed a certain amount, and instead raise them to the zone's Chinese executive director and chairman. On the ground, TEDA marks its presence and authority in an obvious way through close monitoring and supervision of its employees. The company's Organisation Management Department, led by a Chinese manager, has a policing function over the appearance, attendance, productivity of Egyptian workers. This provides further support to the argument that the lead economy manages and controls coordination of economic activity in the zone.

4. Conclusion

The global spread of multinational firms has given rise to the idea that participation in globally dispersed production networks is the surest way to build an export profile and to create opportunities for industrial development. New models of economic zones have been promoted as experimental laboratories to incorporate host economies into the value-creating process, while helping lead firms to take advantage of variations between factor markets among continents, countries and regions (Howells and Wood 2017, 4). In Egypt's SETCzone government activism has had an essential role in the delivery of policies to facilitate the entry of Chinese capital. Developing a suitable investment environment is achieved by way of a formal special investment regime that authorises the provision of public inputs to support the operations of manufacturing firms, and informal channels of coordinating, bargaining and negotiating to reach mutually profitable cooperation arrangements. The aim of this paper has been to shed light the forms of collaboration that emerge when production in the developing country is owned and controlled by lead firms. It intends to draw attention to how asymmetries in market power allow firms in the lead economy to influence coordination of tasks within the value chain that limit opportunities for vertical advancement in the host economy, highlighting how state authorities as well as actors at the above- and below-state level cooperate outside formal authority structures to determine how resources are allocated within the chain.

The main points emanating from his discussion are as follows:

A contemporary feature of economic globalisation is the ability of firms to segment production activities and seek optimal locations to transfer the different stages of the production process (Buckley and Gauri 2004, 82). The SETCzone is an economic instrument employed by China as part of its strategy to reduce the cost of internationalising production in order to be able to retain competitive advantage in traditional manufacturing industries. Based on this objective lead companies establish subsidiaries in the industry cluster to undertake production and logistical functions. Preferential policies are offered according to the specific needs of the firms that locate there, including provision of low-wage labour, cheap energy, specialised infrastructure and transaction efficiency. While such policies have been beneficial to Chinese enterprises, the most important advantage of clustering for the host economy, local sourcing of inputs by foreign enterprises, is missing. The absence of domestic linkages prevents the generation, transfer and diffusion of knowledge and technology to local firms, excludes local producers from the gains of globalised production and create an enclave economy linked to international markets but isolated from the rest of the domestic economy.

Thus, operating in value chains provides opportunities for firms that are big players to improve productivity and performance while restricting the participation of suppliers in a relatively weaker position of power, highlighting the asymmetry of relationships that emerge between host countries and their industrialised partners in the context of FDI-based industrial clusters. This dynamic is inherent to the nature of joint production that is focused on keeping costs and wages low to benefit nodal manufacturers. In this regard the main criteria for success and sustainability of economic zones, particularly models established exclusively on overseas investments, is to improve the competitive performance of foreign firms that are based in the cluster relative to their performance without relocating. This can be achieved without necessarily needing to develop supplier relations in a global economy where transaction costs are low and where markets for intermediate inputs are easily accessible. China's particular strategy of direct ownership is an example of how global economic integration as determined by firms coordinating and managing dispersed production results in unequal exchange. The exclusion of domestic producers clearly works in favour of Chinese export policy, retaining control of technological advantage by the lead firms while making sure to exploit local sources of competitiveness that improve business productivity. In similar examples even when developing economies do manage to increase value chain integration, they face difficulty in increasing value-added. Low-skill assembly and task based production commonly found in economic zones is not conducive to creating and improving capabilities, suggesting that unless economic zones are geared towards attracting and generating higher-value added industries they are likely to fail as a strategy to spur industrial development in host economies (Warr and Menon 2015, 15).

In other words, without channels through which domestic firms can access key external knowledge, zone initiatives may create limited jobs and perhaps even generate a degree of economic growth, but will have limited capacity to initiate the type of long term structural

change that will improve overall welfare of citizens. To leverage an offshore regime as a breakthrough towards achieving a transformative impact a strong emphasis on technology learning and innovation is needed. Coordinating opportunities for learning would allow domestic industry to take advantage of GVC related interactions, and enable industrial clusters to sustain their growth and upgrade their activities. To be effective zone programs should be treated as an integral part of national and regional development strategy alongside responding to demand by the private sector.

Factors for success include creating a clear strategic framework for knowledge learning and the use of supplies, facilitating knowledge sharing and learning that is directly relevant to the operations of specific firms based on the needs of domestic industry, and heavy government investment beyond just the initial stages of providing basic infrastructure and facilitating business services. Further to nurturing relationships between buyers and local suppliers facilitated advantages may include providing loans to small private firms or attracting venture capital to invest in the zone. In addition, there should be clear institutional mechanisms to ensure that the economic zone is closely linked to domestic enterprises and industrial clusters through supply chains in order to stimulate synergistic learning and enhance the competitiveness of local firms. The intentional transfer of knowledge, technological and managerial capabilities will support the evolution of economic zones into centres of technology adaptation, generation and diffusion rather than a source of quick financial relief, a necessary condition for successful industrialisation to occur through such interventions.

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Appendix 1

Summary of Special Economic Zones Law No. 83 of 2002 (GAFI 2018)

Overview In May 2002, Parliament approved the Special Economic Zones (SEZ) Law No. 83 of 2002, which provided for the establishment of special zones for industrial, agricultural or service activities designed specifically with the export market in mind. The law allows firms operating in these zones to import capital equipment, raw materials and intermediate goods duty-free. Companies established in the new zones will also be subject to lower corporate taxes and exempt from sales and indirect taxes. They will also operate under more flexible labor regulations and enjoy other incentives. The law's executive regulations were issued in September 2002.

Currently, one special economic zone is operational in the North West Gulf of Suez; it is managed by the General Authority for the Special Economic Zone North West Gulf of Suez.

Main Provisions

The special economic zones and the authorities that manage them are established by a Presidential Decree. The aim of each authority is to encourage investment (in the economic zone under its responsibility) toward the establishment of projects that are able to compete with comparable ones abroad.

Each special economic zone has a special customs and tax administration system established by its board of directors with the approval of the Minister of Finance.

Incentives and guarantees offered to projects operating in SEZs include the following:

- The projects operating in economic zones may not be subject to nationalization, nor may they be subject to sequestration, freezing of assets or confiscation (except by a judicial judgment). Projects are entitled to decide on the prices of their products and services without governmental interference.
- Projects may terminate the employment contracts of employees in the special economic zones according to terms simpler than those generally prevailing under the Egyptian Labor Law. Projects are also permitted to establish a special system for the social insurance of terminated employees.
- Each project's income tax is 10 per cent of its net income, with the exception of the income derived from the salaries of project employees, which is taxed at a rate of 5 per cent.
- Profits derived from bonds and loans to establishments in the special economic zones are exempt from taxes; and no sales tax, duty or other direct or indirect taxes may be imposed on them.
- The machines, raw materials, spare parts and components necessary for the authorized activities in the SEZs may be imported without permit and are exempt from customs tax, sales tax and all other taxes and duties. The products of those establishments may be exported without permit. They are subject to the customs tax, sales tax and other taxes and duties only on the imported components of those products when they enter the local Egyptian market.