CPEC, SEZ (Special Economic Zones) and Entrepreneurial Development Prospects in Pakistan

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Abstract:

The emergence of Special Economic Zones (SEZ) around the globe gained importance especially in the developing world to attract foreign direct investment (FDI). There is ample evidence in recent literature to establish a strong link between knowledge spillovers and spatial economic structure contributing in regional economic development. Conventionally there are similar patterns found in international and regional economics that describes the incidence of higher factor mobility within different regions of a country than between countries. The general results of the spatial production function are that the output of a given regions increases with increase in knowledge and the capital inputs. The same is found to exist in Pakistan where in different regions technology utilization is not static and its use is evolving with the passage of time in other regions as well. In order to make the SEZs successful in Pakistan, the government needs to follow a gradualist approach toward reforms, while promoting and strengthening the local governments and decision decentralization. The government must set clearly understandable goals and performance benchmarks, scrutinizing, and competition not only for private but also for public sector institutions responsible to create enabling environment for new investments. At the same time it is needed to improve the institutional efficiency and data gathering, processing and dissemination to support research initiatives and policy making.

Keywords: Special Economic Zones, Spatial Production Function, Entrepreneurial Clusters

Introduction:

Over the course of their history, China and Pakistan have developed strong political, defense, economic and strategic relations. The year 2015 proved to be a milestone as both countries decided to move ahead with their plan to establish China-Pakistan Economic Corridor (CPEC) and integrate with other sub-regions of Asia to actively participate in regional economic growth. As CPEC is composed of roads, routes, offshoots, and energy generation projects that would eventually have immense impact on both the countries in particular and all neighboring countries in general and expected to be operational by 2030. It is reflection of Chinese 'One Belt - One Road (OBOR)' concept that is poised to connect sixty countries to enhance economic integration between Asia, Europe, and Africa.

CPEC is of immense importance for Pakistan as it shall run through its essential geo-strategic locations that have still a huge development potential to contribute to the national growth. The activities of construction of corridor are likely to speed up the local development during and after the completion of the project. Initially it is expected to bring employment in construction industry but as it runs through the underdeveloped regions of Pakistan, it holds immense potential to develop the existing potential and exploit the untapped resources. In order to attain sustainability in development process the policy focus must integrate growth and distributional effects of economic gains by taking into consideration the social barriers of discrimination and prejudices based on ethnicity, gender, region and language. In order to attain sustainability of growth effects of CPEC, developments in agriculture sector can play a key role in attaining food security, employment protection, adoption of new technologies and bringing marginalized communities in the mainstream economic activity.

The emergence of Special Economic Zones (SEZ) with the regime of trade liberalization around the globe gained importance especially in the developing world to attract foreign direct investment (FDI). The 'infant industry argument' cannot be forever protective for local industry. Indigenous value creation necessarily needs to be aligned to compete with the business realities of the time that is a challenge for public policy initiatives. Therefore, SEZ Ordinance (2015) is an effort to create the climate for boosting investment – foreign and local – to address this issue of inefficiency and insufficiency in value addition abilities. These initiatives will harness local

potential to create an enabling environment for entrepreneurial actions that can lead to regional and national economic growth. With about 40% population below poverty line, Pakistan needs a modern approach to economic growth so that benefits of CPEC may be enjoyed by all tiers of the society.

A large majority of the population, about 70% of the total is directly or indirectly dependent on agriculture for its livelihood in Pakistan making a contribution of about 23% in the annual GDP. Agriculture sector is primitive and backwardness having lower level of processing ability, value addition and entrepreneurial activity. CPEC has included agriculture as a priority area that includes two contracts for establishment of cotton and marine research institutes. Agriculture holds immense potential for development of small and medium scale enterprises that can support indigenous value addition and employment.

Connecting the far off regions of Pakistan through CPEC will generate entrepreneurial actions especially by utilizing available resources, reducing entry cost, increasing net returns and formation of clusters. This connectivity will lead to higher skills development to produce differentiable goods and services accruing economic benefits to these regions.

Review of Literature:

Growth process in any country over the course of its history gives rise to spatial economic structures. This is mainly due to the presence of externalities in the form of knowledge spillovers and competition in the markets. This is precisely the main thesis of endogenous growth theory (Romer 1986, 1990). But at the same time other externalities also come into effect like pooling of labor with similar types of skills and needs, sharing of intermediate goods for further value addition, and linkages of firms with suppliers of varying inputs needed for production activity (Marshall 1920; Krugman 1991a).

Earlier Audretsch and Feldman (1996) and later Caniels and Romijn (2005) empirically found the link of knowledge spillovers shaping spatial structures with in a geographical space. But earlier Jaffe et al. (1993) empirically found that knowledge spillovers are bounded geographically but the structure of the economic activity restrain the spillover effect, where as impact of technology spillover is mainly due to factor mobility across regions. The knowledge

spillovers are not a random happening as old ideas generally lead to development of new technologies and way to conduct business (Weitzman, 1998).

Choice of location and type of organization among other factors determine the entrepreneurial action for new startups (Harbison, 1956). Prescott and Wisscher (1980) pointed out that the growth of firm is mainly attributed to capital accumulation and firm-specific knowledge. But the internal structure of organization determines efficiency and performance (Chandler, 1977; Atkeson and Kehoe, 2005). Firms preferring to limit geographical range of production activity succeed to reduce transaction costs (Coase, 1937). In addition to existence of externalities in capital, knowledge and technologies, the individual factor cannot be overlooked. The idea generation process and experimenting with new goods and services is outcome of an intellectual effort. Entrepreneurs play their role in internalizing individual externalities for the general efficiency of the firm. This also has its impact on decision of the firm to agglomerate with other firms or not within the same geographical space due to accruing comparative advantage over other (Papageorgiou, 1978; Papageorgiou and Smith, 1983).

Generally the line of research in spatial economics is concerned with impact of spatial agglomeration along with urban development with economic growth (Duranton and Storper, 2005; Rossi-Hansberg, 2005). Over the course of history the researchers have considered space as a single point in theory (Isard, 1949; North, 1955; Quigley, 1998; Millo, 2012). But the later developments have expanded the scope of space as a collection of system of cities (Rossi-Hansberg, 2006; Baldwin and Forslid, 2000; Fujita and Thisse, 2003). Similarly, the geographical structure of the region has also been under discussion like Ohlin (1933), and Krugman (1991). They introduced distance of factor inputs from the center of economic activity to understand the geographical structure over a space. Krugman (1998) propagated the use of modeling strategy that uses a 2-D space in continuous functional form with consideration of heterogeneity and hierarchical structures. The centre of economic activity in a geographical location has been understood in the form of concentric rings (Tinbergen, 1961) or a hexagon lattice system (Lösch, 1940) a circle (Papageorgiou and Smith, 1983; Lucas and Rossi-Hansberg 2002). But starting from Hotelling (1929), the adoption of simplification in the model building, spatial structure is considered as a continuum over a straight line even by Solow and Vickey (1971) and Rossi-Hansberg (2005).

Generally Tobler's first law of geography: “Everything is related to everything, but close things are more related than things that are far apart" sets the canvas for spatial analysis. Models thus constructed usually dealing with cross sectional data take into consideration the correlation between spatial economic units (Anselin, 1988; Millo, 2014). But some empirical studies used panel data with ability to capture the spatial variability while controlling for multicollinearity among the variables extending the sample size that in turn yields more efficient estimators (Elhorst, 2003). Furthermore, the techniques have been improved to control for both heterogeneity and spatial correlation in the panel data for spatial analysis (Baltagi et al., 2003).

When it comes to choice of production of goods and services, Krugman (1980) stressed that lower level of comparative advantage at home causes a strong thrust of import of a good. Eventually the increasing returns will cause production to be confined to one geographical location for production for each type of good especially when trade and transportation costs are accounted for making the country an exporter of that good. Therefore, ‘home market effects’ distinguish comparative advantage and increasing returns to determine the spatial production decisions. International and regional economic literature delves similarly upon factors mobility across different productive regions within or across countries. Given the supply side economic factors, Linder hypothesis asserts that supply response in more than proportional to deviations in the patterns of demand making production decisions based on merely correlations problematic. At the same time the relative importance of a good for a specific region in relation to other regions determines the level of resources commitment to a particular industry (Walz, 1996). Therefore, large countries have higher supply of differentiated and diverse products without incurring trade costs. Larger countries also provide opportunity to the producer to locate their production facilities in order to enjoy higher degree of comparative advantage. This tends to an increase in the returns to the factors of production especially in the form of wages along with overall productivity. Therefore, the differences in underlying microeconomic phenomenon can explain the impact of spatial economic and international trade theories in the light of comparative and competitive advantages for geographical locations for production.

Special economic zone (SEZ) is a geographically bounded area having a central management for providing benefits of physical location within the zone. These zones have their separate customs area to gain from duty-free and related liberal laws (World Bank 2009). SEZs accrue direct and

indirect economic benefits like employment generation and foreign exchange earnings; and knowledge based urban growth, respectively. SEZs are created to cater for needs of export-processing, centralized industrial parks, free trade activity, and free ports for merchandizing jointly or specifically. China has created SEZ to deliver more or less all these and related services instead of focusing on single function of a zone (Wong, 1987). There are seven specific SEZs in China: Shenzhen, Zhuhai, Shantou, Xiamen, Hainan, Shanghai Pudong New Area, and Tianjin Binhai New Area. In addition, China has developed economic zones that are delivering specialized concentrated services like: High-tech Industrial Development Zones (HIDZs), Free Trade Zones (FTZs), Economic and Technological Development Zones (ETDZs), Export-Processing Zones (EPZs), etc.

Industrial clusters are different from a SEZ as a cluster is originated because of presence of inter-connected firms from related industries at a specific geographic location, like financial intermediaries, heavy industry supporting small related processing units, governmental agencies, and educational institutions imparting different skills. The reason for the link of these entities is the spillover effect of externalities and complementally dependences (World Bank 2009). The support of the government crates an enabling environment where planned and coordinated efforts of private sector enhances the ability of resources utilization leading to enhanced competitiveness at regional, national and international levels (World Bank 2010).

The difference between SEZ and industrial cluster is in their evolution. There is an organic growth of industrial clusters whereas SEZs are generally crated through government action with a 'top-down' approach. Developed countries have witnessed the evolution of industrial clusters from SEZs i.e. industrial parks and export processing zone. On the other hand this phenomenon is not generally seen in developing countries indicating the need for efficiency of the public sector for fostering and supporting growth of private enterprise development. Zeng (2008) found in a study of 11 industrial clusters in different African countries that most of them were impulsively created except for export processing zone culminating the growth of textile cluster in Mauritania. Therefore, creation of SEZ is a challenging task for governments as there are numerous cases of failure in developed and developing countries where political or personal motives were behind such initiatives (Plummer and Sheppard, 2006). Government efficiency and policy effectiveness supporting dynamic economic decisions is necessary for success of a SEZ. If

not generally, at least within the zone there must be present a well functioning market system supported by public sector. The clear understanding of markets strengths and comparative advantage at home along with insight of future development path focused at local and international business development by the policy makers and business fraternity is essential for success of a SEZ. Decades of hard work and efforts from public and private sectors created the environment where industrial clusters have started to emerge from SEZs in China. Zhongguancun (Beijing) and Shenzhen have grown cluster related to information and communication technologies, Pudong (Shanghai) to electronics and biotech clusters, Wuhan to opto-electronics, Dalian to software development, are a few examples (Fu and Yuning, 2007).

Therefore, the risk of failure of a SEZ is linked with clear understanding of domestic potential harnessed to withstand international competitive environment. Creating of a SEZ with right mix of policies has reaped benefits to numerous economies across globe. Pakistan also started to develop the industrial zones in different regions but those could not generate the expected results. The reasons for their dismal performance have been structural as well as lack of interest from the private sector to participate in such zones. Now the history has given us another chance where need is to learn from previous mistakes and enact a culture of progress, efficiency and competitive environment with initiative lying with private sector having support of public sector growth oriented policies.

The Theoretical Framework:

The study used a cluster (i.e. the aggregated locus of economic activity) to comprehend whether economic activity accumulates, expands, or intensifies there. This will help to observe the spatial-temporal dynamics of a cluster (or SEZ) that federal government intends to establish in 12 cities of Balochistan and Khyber-Pakhtunkhwa under the CPEC (i.e. Turban, Khuzdar, Quetta, Bostan, Qila Saif Ullah, Mansehra, Nowshera, Hattar, D I Khan, Kohat and Bannu). Spatial intensity (I) of entrepreneurship increases with increased availability of factor input (W) when the geographical range (D) in the cluster is constant. Spatial intensity (I) decreases if the geographical range (D) declines with constant supply of factor input (W)[1]. The spatial production

[1] Spatial intensity index, $I = \frac{\sum w_j}{\pi D^2}$, where, I = spatial intensity, W = a factor input distributed with amount w_j at location j within geographical region R, D = geographical range, where D_j is the distance of location j from center of

function relates productivity of the cluster on the factor inputs along with their relative location (Coase, 1937); enhance knowledge even in the form of spillovers from the competitive environment; develop or adopt newer technologies to offset the pressure of increasing wages, rents and other associated costs of production. The long run cluster growth is function of growth rates of factor inputs, degree of knowledge and rate of spatial expansion of inputs. Therefore, accumulation and furthering the technological base, human and physical capitals are responsible for growth process over a geographical space. The emergence of entrepreneurial clusters lead to agglomeration economies that is then translated into higher degree of sustainability of firms over extended periods in time, and then the overall economic growth. The assessment of agglomeration was not the focus of this study though.

Due to non-availability of all the data of labor, firms, technology, agriculture and natural resources of the specified SEZs, the study analyzed the spatial intensity and performance at the regional level (i.e. provinces of Pakistan).

Economic geography and spatial economic analysis has gained attention of researchers especially since last few decades due to global integration and increased competition like contributions by Anselin (19880), Elhorst et al. (2007), Rossi (2005), Lin (2010) and Kapoor et al. (2007) are a few.

Empirical analysis of spatial models based on cross sectional data and identification of correlation in spatial units progressed to analyses based on panel data with better control of spatial correlations and heterogeneity (Anselin, 1988; Baltagi et al., 2003). But still the problems persist with availability of reliable spatial data. This lead to different modeling techniques to improve the fit of data e.g. transcendental logarithmic production function (trans-log) of the Cobb-Douglas function imposing no prior restrictions on elasticity of substitutions of factor inputs and returns to scale (Christensen et al., 1971; J. Klacek et al., 2007). The study specified trans-log Cobb-Douglas production function in two ways. First, the function constructed assuming constant and neutral technological progress, and second, this assumption in relaxed to

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cluster (and $D = \frac{\sum w_j D_j}{W}$), C = center of the cluster. Given this information, the study estimated the spatial production function: (1) $Y_i = f(\frac{A_i}{D_{Ai}^2}, \frac{H_i}{D_{Hi}^2}, \frac{K_i}{D_{Ki}^2})$, where output is function of quantities of technology for production, physical capital, human capital, D_{Ai}, D_{Ki}, D_{Hi} are mean distance of the three factors of production. Cobb-Douglas production function in terms of spatial intensity of factor of production can be written as: (2) $Y_i = A_i^{\alpha} H_i^{\beta} K_i^{\gamma} D_{Ai}^{-2\alpha} D_{Hi}^{-2\beta} D_{Ki}^{-2\gamma}$.

assess non-constant and non-neutral technological progress[2]. Wald test enables to select the appropriate functional form given the fit to the data. This will enable to ascertain whether in Pakistan the state of use of technology for production is improving or static.

Data:

The study intended to choose the agriculture inputs that can be transformed into processed exportable products through value addition. Indices measuring the value of technology used in processing available agriculture inputs and capital requirements of new ventures posed problems in construction due to non availability of relevant data sets. Similarly, the labor movements and settlement data sets are also not available with accuracy. Another problem was defining industries and goods considering industry classifications with technological criteria and use of factor inputs rather than substitutability in demand. The standard industry definitions carries information of production technologies (Maskus, 1991), but in Pakistan, such segregated data sets are not available. The study, therefore, used the theoretical underpinnings that varieties of goods within an industry use common production technologies.

Estimation Methodology:

Equations (1) and (2) are based on cross-section analysis and it was assumed that the same technology is available for all firms in the region for the same industry at the same period of time. However, for equations (3) and (4) panel data is used for estimation after relaxing the strong assumption on the state of technology. As the standard specification of Cobb-Douglas production function is nested in the trans-log forms, study applied the Wald test to ascertain applicability of trans-log production function over Cobb-Douglas production function. Following the literature, generally maximum likelihood method (ML) (Anselin, 1988) and generalized method of moments (GMM) (Kelejian and Prucha, 1999) are used for spatial models. But ML is also preferred by some especially in presence of spatial lag, spatial errors and non-spherical residuals. The estimation of all the equations were done with ML (Anselin, 1988).

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[2] Consider equation with cross-product terms between time, input measures and a quadratic time trend, and constant and neutral technological change:

(3) $\ln y_i = \alpha_0 + \Sigma\ \alpha_i \ln x_i + \frac{1}{2} \Sigma \Sigma\, \alpha_{ij}\ \ln x_i\ \ln x_j + \alpha_t t$

and with non-constant and non-neutral technological change:

(4) $\ln y_i = \alpha_0 + \Sigma\ \alpha_i \ln x_i + \frac{1}{2} \Sigma \Sigma\, \alpha_{ij}\ \ln x_i\ \ln x_j + \alpha_t t + \Sigma\ \alpha_{ti} \ln x_i + \frac{1}{2}\ \alpha_{tt} t^2$

Empirical Analysis and Results:

The general results of the spatial production function are that the regional output is increasing function of knowledge and the capital. Although most of the individual coefficients are not significant but on the basis of overall significance of the model, the study concludes that the output is responsive towards the development of production inputs especially the human factor. The spatial intensity of the human development is not evenly distributed in all the regions due to non availability of technical and skill building institutions in the peripheral regions. The capital development in the form of infrastructure, communication networks (roads and electronic communication) and other urban facilities have lead to development of small and medium enterprise. That is why the results support the impact of spatial capital intensity on aggregate output.

As a result of a significant Wald test the study found significant fit of trans-log function with constant and neutral technological change for conventional Cobb-Douglas production function. Furthermore, with the help of Wald-test the study found trans-log function with non-constant and non-neutral technological progress to be significant over assumption of constant and neutral technological progress. Therefore, the study establishes that the technology utilization in Pakistan is not static and it is evolving with the passage of time. The individual coefficients do not show much of the significance for specific interpretations indicating the problems present within the data set. The caution is therefore, exercised in interpreting results and forming opinions therein.

Discussion, insights and suggestions:

Special Economic Zones in China lead to a controlled social experiment to test the efficacy of market-oriented economic reforms. SEZs lead to creation of new policies and institutions along that successfully enhanced exports, foreign exchange earnings and employment by attracting foreign investment and technologies. It lead to the development of high-tech industrial development zones through Torch Program with an objective of to develop culture of research and development (R&D) at corporate and universities level to support development of new and high-tech products with commercial value. The free trade zones established in 1990 enabled China to test impact of free on national economy and productive capacities before joining World

Trade Organization (WTO). 44 Out of 61 EPZs are located in the coastal region to stimulate export-trading and processing (ProLogis, 2008).

Common key elements of China's SEZs success are political, social as well as business rooted. Top leadership showed strong commitment to reforms and institutional building that enables these zones to contribute to economic growth. The top leadership tried to endure a stable and conducive macro environment and successfully averted political opposition. Deng's initiative for openness by decentralizing business decision making made institutions autonomous which in turn encouraged private firms (local and foreign) to invest in the zones. Some of the measures of his policies included provision of land at cheaper rents, tax holidays, removing institutional barriers to speedup customs clearance, removing barriers on imports of raw materials and intermediate goods used in exportable value added products, exemptions of exports taxes, improving labor laws to attract inflow of skilled workers. The restricted quota to sell the product domestically induced the producer to seek better foreign markets leading to higher exports and continuous investments by the firms to attain outward looking comparative advantage (Enright, Scott, and Chung 2005).

With institutional reforms, the central government formed and encouraged the local governments to create conducive environment for conducting business. The efficient regulatory and administrative environment backed by sound infrastructure of communication, energy, water, sewerage, and ports, attracted foreign direct investments and remittances. It lead China to strengthen the local business arena with potential to compete in international markets. The accumulation of capital, technology, and business skills has spillover effect that helped building local industry. All these activities have created an environment that supports inherent urge to acquire higher level skills eventually translating into R&D activity (Sonobe and Otsuka, 2006). This development leads to evolution of innovation culture especially by qualified workers and managers. SEZs provided the location advantage by developing them in coastal regions or near major cities that facilitated foreign trading due to availability of major infrastructure, such as ports, airports, and railways (Enright, Scott, and Chung 2005). It lead to clusters formation with involvement of educated labor force especially for seafood and fruits processing, stone carving, etc. with low-cost production. The segmentation of manufacturing into smaller productive units to form a larger industrial cluster is supported and patronized by the local governments and

decision centers. In the light of the above discussion, the study puts forth the following suggestions:

The top leadership must demonstrate strong commitment to allow institutional autonomy and flexibility to support small, medium and large startups. The policy initiatives must support balanced growth in all the regions to support capital accumulation (human and physical) and controlling for labor mobility and social distress. Network of technical training imparting institutions must be built to create skilled labor force at domestic level. The process of reforms must not be stagnant but at the same time must be a gradual and cautious.

Public-private partnership approach is necessary to undertake the initiatives that need large investments but have business development potential e.g. mining, ports services etc. Research institutions must be involved in continuous benchmarking and monitoring the business competitiveness. Improve data gathering, processing and dissemination to support research and policy making.

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Appendix:

Table 1 **Spatial Production Function**

Coefficients / Regions	A	β	Γ
BALOCHISTAN	0.0468*	0.036*	0.2174**
KPK	0.0461*	0.0461**	0.197*
SINDH	0.0678**	0.105*	0.3204**
PUNJAB	0.221*	0.157**	0.4358***

All variables are logged. *p<0.1, **p<0.05, ***p<0.01

Table 2 Trans-log Production Function

Coefficients	α_0	α_i	α_{ij}	α_t	α_{ti}	α_{tt}
Equation (3)	0.0113**	0.1037*	0.1797**	0.0731***	-	-
Equation (4)	-0.0498**	0.0386*	0.1127*	0.1091***	0.2036**	0.4358**

(3) $\ln y_i = \alpha_0 + \Sigma\ \alpha_i \ln x_i + \frac{1}{2} \Sigma \Sigma\, \alpha_{ij}\ \ln x_i\ \ln x_j + \alpha_t t$

(4) $\ln y_i = \alpha_0 + \Sigma\ \alpha_i \ln x_i + \frac{1}{2} \Sigma \Sigma\, \alpha_{ij}\ \ln x_i\ \ln x_j + \alpha_t t + \Sigma\ \alpha_{ti} \ln x_i + \frac{1}{2}\ \alpha_{tt} t^2$

All variables are logged. *p<0.1, **p<0.05, ***p<0.01