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Abstract

This paper analyzes if the industrial policy framework of the Indian Government with regard to the proliferation of SEZs has satisfied its aims and objectives. The analysis however, shows otherwise. The empirical results show that the policy of the Indian Government has been lopsided, wherein the concentration of SEZs has increased in States which face lower levels of unemployment and a comparably high level of FDI inflow. Further, the concentration of the SEZs has been restricted majorly to the IT industry resulting in rigidity in the export mix. Policy implications hint towards a diversification of the SEZ industry portfolio and in increasing the size and therefore, the economic impact of these zones.

JEL Classification: **F13; F14; O24; O25**

Keywords: SEZ, Indian Industrial Policy, FDI, Unemployment, Export, Economic Development

1. Introduction

The dynamics of Industrial districts has been an area of interest for both economics and management scholars. It has also been a much debated topic within development studies. These structures have had a profound impact on economic development of a number of nations in the past. Industrial cluster in Italy have been studied extensively and are still a dominant element within the Italian economy. In Asia, countries like Japan, Taiwan and Korea have also experimented with special economic zones at some point in time. More recently, the SEZs in China have been at the center of the debate on economic development.

This strategy of economic zoning in a particular area has not been a recent phenomenon in India. India was the first Asian country to establish a Export Processing Zone (EPZ) in Kandla (Gujarat) in 1965. These zones however did not kick-start the kind of industrial development that the government had hoped for. With an unclear policy, negligible incentives, strong administrative control and weak infrastructure these EPZ gave mixed results with a rather unimpressive performance.

Only 8 export processing zones were set up across 7 states during the period 1965-2000, locking the area of 2521 acres with 95000 people employed. In 2000, the SEZ policy replaced the EPZ policy which stimulated the SEZ activity. Between 2000 and 2005, 11 new SEZs were set up. However the scenario transformed completely after the SEZ act was passed in 2005. As of December 2008, formal approvals were given to 552 SEZs across 23 states. Of them 274 across 16 states were notified. Of the 274 notified SEZs, 101 reported some economic activity[1].

(Pyke, Becattini, & Sengenberger, 1990) defined an industrial cluster as a socio-territorial entity which is characterized by the active presence of both a community of people and a cluster of firms in a bounded area. With the coming up of SEZs across the world, a new found interest has gained a lot of momentum in this field. (Graham, 2004), (Abraham, Konings, & Slootmaekers, 2010) among many others have studied the issue of SEZ as an Economic, phenomenon studying the role of FDI that comes in with the establishment of SEZ. (Sampat, 2010) has focused on the negatives impact that an SEZ in the local regional occupational patterns and the debate of its contribution towards economic development of the

[1] Aggarwal (2010)

region. Scrutiny of the location of the SEZ and its contribution towards a sustainable competitive advantage for any particular SEZ has also been the focus of many debates like (Dhingra, Singh, & Sinha, 2009) and (Makabenta, 2002).The location of the SEZ has been frequently discussed within the economics and management literature.

The economic benefits of an SEZ are said to encompass both the state and the firms within the cluster. While for the firm, localizing within a cluster would mean greater contact with supplier resulting in a streamlined supply chain, as well as the economic benefits from fiscal incentives the governments can hope for a increase in exports and an increase in competitiveness which would drive innovation. It would also mean more spill overs which could be taken up by other smaller firms often outside the. (Karakaya & Canel, 1998) found that the location of the firms is critical contributing factor to the competitiveness of a firm. Other empirical studies show that SEZ that are located in a developed area have more chances of being successful that those that are located in poor area with less industries[2] . (Mukhopadhyay & Pradhan, 2009) analyzed the relationship between the effect of SEZ on the initially underlined objectives. Their results indicate that the SEZ worsen infrastructure and the cost of SEZ are real while the benefits are not so substantial. The explanatory variables used by them however were indirect as share of urban population, extent of literacy and share of Schedule tribe and Scheduled casts were used.

In the present study we extend the analysis by using latest data on direct variables to understand the match or mismatch between the objectives and effect of establishing an SEZ in India. It would also look at a macroeconomic framework under which a country comparison between India and China has also been done. This is important since the SEZ phenomenon in India is primarily inspired by the Chinese model. However, as we see in the proceeding sections their do exist striking differences between the Indian and the Chinese model.

While the literature is abundant on policy oriented, often prescriptive studies, few have empirically tested whether the motives behind setting up an SEZ have been realized or not. In this paper we look at the case of India and investigate if the purpose behind setting up these economic enclaves is being realized.

The objectives of setting up SEZ in India according to the Ministry of Commerce, Government of India are -

[2] IDFC (2001)

a. Generation of additional economic activity
b. Promotion of exports of goods and services;
c. Promotion of investment from domestic and foreign sources;
d. Creation of employment opportunities;
e. Development of infrastructure facilities;

The aim of this is study is to empirically test, with the available data, the extent to which the SEZ Act has served it's propose. The following section provides an overview of the data available and outlines the econometric methodology used. Section three would outline the results and interpretation of the econometric analysis as well as the Strategic insight into the development of SEZ in India. This would include a discussion on Size effect, National Competitive advantages and comparative advantages that SEZ can offer to the Indian economy. Section four would conclude the study with relevant findings and policy implications.

2. Data and Methodology

The data used in this paper have been obtained from a variety of sources. The first consists of a crossection database of the no. of operational SEZs in each state, NSDP, infrastructure index, FDI and employment used for estimations based on the probit model. The data on the number of operational SEZs have been taken from the annual report 2010-11 on the Special Economic Zones (SEZs) and export oriented Units (Eous) of the Ministry of Commerce, India. The NSDP data are compiled from the RBI handbook of Statistics on the Indian economy, 2010. The infrastructure index has been taken from the Centre for Monitoring Indian Economy dataset. Some geographical approximations had to be made for considering Union territories since their data was not available. The final variable on employment has been obtained from the Central Statistical Organization's National Account Statistics.

The data also includes figures on the area occupied by each SEZ in India obtained from the handbook of SEZs published by the Ministry of Commerce, Government of India. The relation of the four factors employment, State domestic product, FDI and infrastructure with SEZs is modeled as the probability that a district would have a SEZ, consequently estimated using a probit model. This model estimates the probability of occurrence of an

event as a function of given explanatory variables assuming normally distributed errors. The probit model for our analysis is

Presence of an SEZ in a district = $\int$ (Extent of unemployment, Net state domestic product (per capita), FDI, infrastructural development, state dummies)

Where,

Presence of an SEZ in a district = 1 if any SEZ is situated in that district 0 otherwise.

In a probit model with state dummies, such states where all districts havs SEZs have been excluded from the regression, since they predict perfectly.

Selection effects could distort the results of the analysis by virtue of the fact that samples of not representatives of the underlying population. We account for this in the analysis with the help of the Heckman correction (Heckman, 1979). Hence, in a two step method we estimate the probability of inclusion in the sample and use the estimated probability as one of the explanatory variable in the next step.

STEP 1:

Probability of the Presence of an SEZ in a district = $\int$ (Extent of unemployment, Net state domestic product (per capita), FDI, infrastructural development, state dummies)

STEP 2:

Expected no. of SEZ in a district = $\int$ (Extent of unemployment , Net state domestic product(per capita), FDI, infrastructural development, state dummies, Prob. of the presence of an SEZ in a district)

3. Results

The statistical analysis carried out in this section examines whether the objectives of establishing the SEZs are being satisfied in India or not. Of the five main objectives an analysis of the first three on increasing employability, generation of additional economic activity and development of infrastructure is analyzed in 3.1 and 3.2 respectively. The sections 3.3 and onwards analyze the aspect of promotion of exports and investment promotions.

3.1 Significant Factors

We run an OLS regression with the concentration of SEZs in a state as the dependent variable and the level of unemployment, FDI, infrastructure index and NSDP per capita as dependent variables to analyze which of these significantly impact the concentration of SEZs in a state. The tables 1 and 2 below summarize the results of this regression. As is clearly visible, Unemployment and FDI emerge as significant factors in the first regression. Instead, the infrastructure index is not significant. The results of this regression show that the concentration of the SEZs is in areas with low unemployment and in states with higher FDI inflow. This means that the opening up of new SEZs is not helping in improving the industrial situation of states which are in need of more development.

Variable	Coefficient	Robust standard error	p-value
Unemployment	*-0.0264*	*0.0096*	*0.013*
Infrastructure	*.0011*	*0.0031*	*0.725*
FDI	*0.0302*	*0.0155*	*0.067*
Constant	*0.6182*	*0.4850*	*0.219*

Notes:
The overall regression is significant as the p-value of the F-stat is close to zero due to which we can reject the null of a spurious regression. The regression also takes care of heteroskedasticity. The dependant variable is concentration of SEZs in a state. R^2 value is moderate and is 0.39

Table 1 : OLS Regression; Concentration of SEZ (excluding NSDP)

When the OLS regression (Table 2) below also includes NSDP as a determinant variable the results do not change for employment and FDI. However, the value of R-squared increases which means that NSDP could be used as an explanatory variable in explaining the concentration of FDI. However, NSDP does not emerge as a significant variable.

Variable	Coefficient	Robust standard error	p-value
Unemployment	*-0.0281*	*0.0097*	*0.010*
Infrastructure	*.0043*	*0.0057*	*0.465*
FDI	*0.0329*	*0.0162*	*0.059*
NSDP	*-7.26e-06*	*7.58e-06*	*0.352*
Constant	*0.4834*	*0.5593*	*0.399*

Notes:
The overall regression is significant as the p-value of the F-stat is close to zero due to which we can reject the null of a spurious regression. The regression also takes care of heteroskedasticity. The dependant variable is concentration of SEZs in a state. R^2 value is moderate and is 0.41. The high value of the coefficient of NSDP is due to the fact that the value of individual data points in NSDP is not comparable to that of other variables. Since none of the other variables have been scaled up, the coefficient is high.Since we do not interpret the value of these coefficients no rescaling in necessary.

Table 2: OLS regression of concentration of SEZ (Including NSDP)

Our variable in terms of the concentration of SEZs in a state, is a binary variable, hence, it would be more useful to look at the results of a probit regression on the variables outlined above. Since, infrastructure index and NSDP do not appear significant in the OLS regression; we exclude these variables in the probit regression.

Table 3 summarizes the key results of the general probit regression. These results confirm the findings of the OLS regression by stating that concentration of SEZs is affected positively by FDI and inversely by unemployment. Thus, SEZ concentration is more in areas and regions which have low unemployment and already have a certain level of FDI inflow. Finally, the moderately high value of R squared, enhances the confidence in the results of the ordered probit model.

Variable	Coefficient(df/dx)	Robust standard error	p-value
Unemployment	*-1.08e-12*	*3.02e-11*	*0.106*
FDI	*9.55e-12*	*2.66e-10*	*0.064*

Notes:
The overall regression is significant as the p-value of the chi-square is close to zero due to which we can reject the null of a spurious regression. The dependant variable is concentration of SEZs in a state. R^2 value is substantially high and is 0.75. The high value of the coefficient of NSDP is due to the fact that the value of individual data points in unemployment is not comparable to that of other variables. Since none of the other variables have been scaled up, the coefficient is high. Since we do not interpret the value of these coefficients , no rescaling is required.

Table 3: Ordered probit regression; concentration of SEZ

3.2 Selection Effects

Selection problems occur in samples that are not representative of the underlying population. E.g. certain inherent characteristics / problems, not necessarily economically measurable , that drives the sanctioning of a new SEZ project in a state. In case of our analysis, this factor is extremely important due to geographical disadvantage considerations in the sanctioning of a new SEZ project in a region.

One way to implement this is to estimate the probability of inclusion of these geographical factors in the sample and use the estimated probability as one of the explanatory variables in examining the relationship between FDI, infrastructure and the unemployment in the next step.

As stated in section 2, we apply the Heckman correction method to our analysis to control for any selectivity bias. We can also interpret the coefficients obtained in the final regression. Table 4 summarizes the results of the Heckman correction.

Variable	Coefficient	Standard error	p-value
Unemployment	*-0.2330*	*0.1441*	*0.106*
FDI	*2.0677*	*1.1115*	*0.064*
Constant	*-0.45507*	*1.274*	*0.721*
Mills(lambda)	*-0.5607*	*6.6531*	*0.933*

Table 4: Heckman correction (Selectivity Bias)

In table 4, the value of this selected regressor (lambda)[3] which controls for selectivity is significant and negative in sign. This suggests that the error terms in the selection and primary equations are negatively correlated. So unobserved factors (that we modelled as geographical disadvantage) are associated with the sanctioning of a new SEZ in a state. The coefficient for FDI is also significant and much higher than that in the marginal effects probit model, which means that after the Heckman correction, the FDI effect is profound. The relationship between FDI and the concentration of SEZ is thus robust to correcting for selection effects and is enhanced by it. The same can be said for unemployment.

[3] In the case of our model, is the effect of a geographical disadvantage.

3.3 Size effects

The Indian model of SEZ proliferation is mainly adapted from that of China. While both India and China in the 1970s had similar GDP levels , China has since surpassed India to becoming the second largest economy in the world. It is widely acknowledged that the growth that china has observed in the past years was largely due to its exports. The open door policy initiated by Deng Xiaoping's in 1978 to test the effectiveness of market oriented economic reforms paved way for the development of these special economic zones. Since then, these special economic zones and industrial clusters have propelled China into the forefront of the global economy. It has managed to develop a gigantic manufacturing capacity in the process, pulling a large portion of its population out of extreme poverty. While developing the SEZ in China a major thrust was on generating employment at the same time experimenting with market reforms. The results have been startling. The Chinese economy has grown manifolds in the last 30 odd years. Special economic zones have been instrumental in doing this.

While India's SEZ program was largely inspired by that of China it does differ significantly from that of China. SEZ in India are much smaller than those in China. China started establishing SEZ started from county level and has now moved on to large state level SEZ. The Shenzhen Special Economic Zone for example comprises four districts of Shenzhen City in Guangdong Province, namely Luohu, Futian, Nanshan, and Yantian, with a total area of 493 km². It is the flagship of Chinese phenomenon and has grown at an average rate of about 25% a year for over 30 years. In India on the other hand the SEZ are at a sub city level. The largest Indian SEZ is of 14000 Hectares compared that to 49, 300 hectares in China. It is clear that only large sized zones can generate economic activity on some reasonable scale. In a small zone, the requisite infrastructure and services cannot be provided nor multiple economic activity be promoted. The SEZ's promoted at various parts in India are much bigger than existing EPZ, though compared to the Chinese SEZ's their size is by and large still small. Large area of SEZ facilitates the development of quality infrastructure. This, along with reliability of services helps in improving the efficiency of operations. A large integrated and developed network of infrastructure and services make the SEZ more attractive for investors. In China the SEZ's are part of the larger cities and enjoy good social infrastructure and urbanization. In addition to this, the size of SEZ helps in developing in an ecology of industries in the sense that many complementing manufacturing industries can co exist in vicinity and hence reduce the logistic costs substantially.

3.4 Concentration Bias towards IT/ITes leading to lopsided policy & Rigid Export Mix

From the data that we have synthesized we also see that the geographical concentration as well as the industry concentration of SEZ is biased. In turn this concentration bias will result in a poor distribution of infrastructure development, rigid export mix as well as employment generation across states. The data suggests that out of the total of 579 SEZ that have been formally approved, a staggering 453 are located in coastal states. Interestingly these are also the states that are most industrially advanced and relatively more affluent compared to their counterparts in the north of India. Table 5 gives the list of costal states with the corresponding number of approved SEZ.

States	No of Corresponding SEZ
Andhra Pradesh	*109*
Maharashtra	*105*
Tamil Nadu	*70*
Karnataka	*56*
Gujarat	*45*
Kerala	*28*
West Bengal	*22*
Orissa	*11*

Table 5 Geographical Distribution of SEZ

While establishing SEZs in coastal states does help in reducing logistical costs related to exports it does not fall in line with India's primary objectives of increasing the pace of infrastructure development, employment generation of poorer states that actually require a boost in these aspects.

Moreover, out of these SEZ an overwhelming majority have been approved as IT/ITES SEZ. This dominance of one sector does not seem to fit into the objective of diversifying the Indian export mix. Nor does it really support employment generation for unskilled labor force that is abundant in India. Moreover IT industry in India is already in its maturity stage with special provision put forth by the software technology parks of India. Hence notifying a majority of SEZ as IT related SEZs does not improve the export mix of India which already comprises of 35% of all export[4]. Figure 1 provides the sector wise

[4] The NASSCOM - McKinsey report 2008

distribution of SEZ in India. Of a total of 579 SEZ that have been formally approved 61% are notified as IT/ITES SEZ.

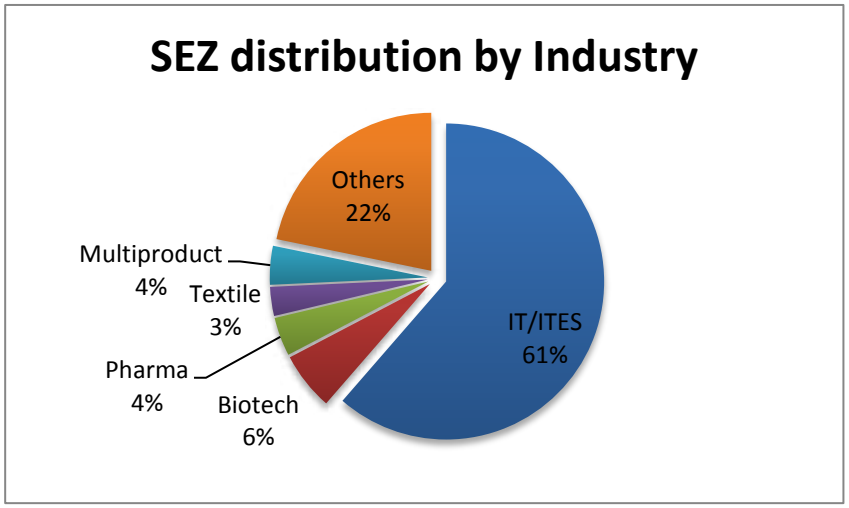

Figure 1: SEZ distribution by industry
Data Source: www. sezindia.nic.in

The largest contributor to the GDP in India is the service sector. It constitutes 55.3% of the total GDP but employs only one-third of its labour force[5] .

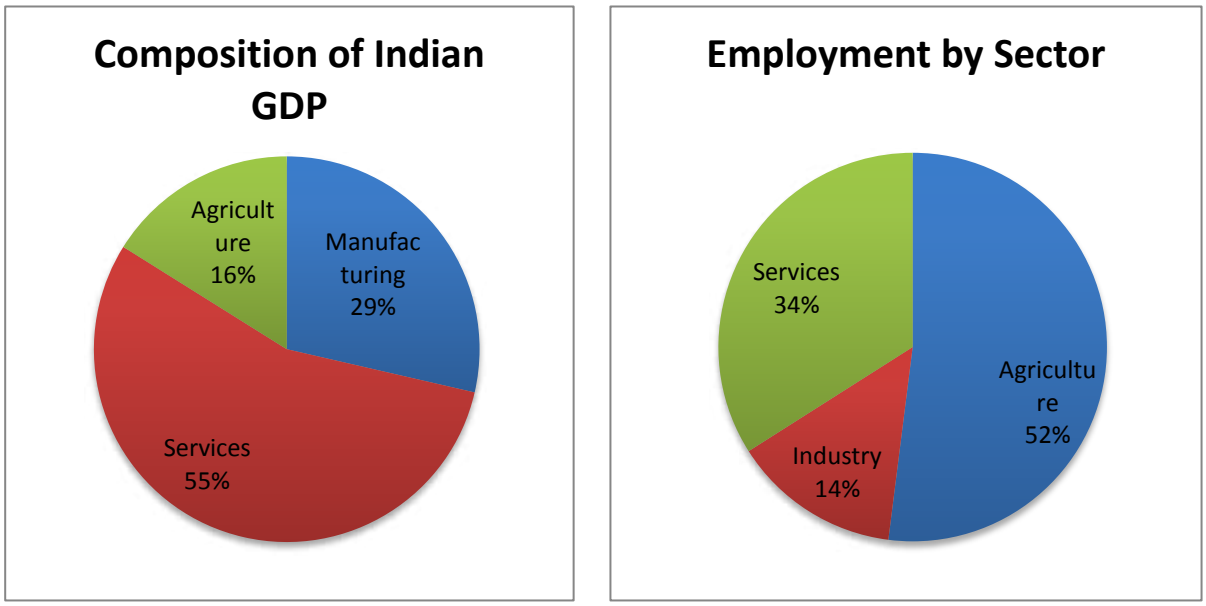

Figure 2: Composition of Indian GDP & Employment by Sector
Data Source : CIA World Fact book

[5] CIA world fact book

Figure 2 illustrates the composition of the Indian GDP and corresponding labor distribution. Therefore, a lopsided selection of SEZ favouring the IT industry would not help in achieving the goals of reducing unemployment. Instead India shou0ld notify SEZ that are labour intensive in order to improve the export mix as well as provide more employment opportunities to the unskilled labour pool of India.

4. Conclusion and Policy Implications

The industrial policy in India concerning SEZs focused on five main policy objectives of helping the states to generate additional economic activit. This was measured by an increase in NSDP per capita, promotion of exports of goods and services (export mix diversification), promotion of investment from domestic and foreign sources (FDI inflow), creation of employment opportunities (unemployment reduction) and development of infrastructure facilities (improving the infrastructure index). We analyzed the significance and impact on the concentration of SEZs in a state due to these factors and vice versa both empirically and qualitatively. Both the qualitative and quantitative analysis, point to the fact that there has been limited achievement of the goals discussed above. Instead, the concentration of SEZs is more in regions already having high levels of FDI inflow and low unemployment. Furthermore, the spread of SEZs has been skewed towards the IT sector, leading to rigidities in the export mix. Finally, in terms of an international comparison with China, the size of the SEZs is much smaller thereby limiting the opportunity to exploit the synergies by complementary industries.

In light of the above conclusions, from the analysis presented in the paper, policy makers should aim at shifting focus from regions and areas where SEZs already exist to deprived regions. This would help in channelization of resources towards regions where unemployment levels are high, FDI inflows are low and infrastructure facilities are poor. Moreover, it is imperative to diversify the SEZ portfolio of India from services to manufacturing with opportunities and sanctioning of funds to new and priority sectors. This could help in overcoming the sluggishness in the export mix of the economy as well as generating labour intensive jobs. Finally, the scale and investment magnitude should also be revised and should aim to adopt international industry best practices.

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