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SPECIAL ECONOMIC ZONES IN INDIA: ARE THESE ENCLAVES EFFICIENT?

Malini L Tantri*

Abstract

The contemporary debate on the SEZ policy has been quite fierce but the focus has been mostly on the issues pertaining to the establishment, sanctioning procedures, land grabbing and protests against the SEZ policy. In the melee, the major issue of economic utility (if any) of SEZs is forgotten or not bothered about. It is known that the laudable objectives of the SEZ policy promise to improve the efficiency in trade and an increase in the production of tradable goods in order to attract foreign exchange. It is necessary to question if this objective has been achieved in respect of implementation. In this paper, along with an analysis of the issue of efficiency of SEZs within the framework of stochastic production frontier technique, we have tried to address the questions raised above. Although the efficiency scores of these enclaves have improved over the years, specifically with the introduction of the SEZ policy (2000-01), it is far below the threshold level as identified in the literature, thus, indicating a larger scope for improvement in efficiency of the existing enclaves. Of the seven conventional SEZs, Santacruz SEZ farer relatively better than others operating on the same production frontier in terms of performance. Besides, one also can observe the emerging contradiction between better export earning zones and efficient zones, which might as well prove a challenge to the policymakers. On the determinants side, besides policy intervention large geographical area accompanied by clustering of units is found to have impacted positively the efficiency scores of these enclaves.

Introduction

The argument in favour of shifting policy priorities from import substituting industrialization (ISI) strategy to one of export led growth gained prominence in the context of promoting an efficient economic system; the underlying reason behind that the economic system, operating under a restrictive trade regime (up to 1990s) had not only failed in terms of meeting its objectives but also generated non-performing assets resulting in vicious circle of inefficiency in the process. Thereafter, most of the policy strategies initiated in the post reform period gained a wider acceptance in India. The major policy changes in this direction include, gradual reduction of protection extended to domestic units, providing space for private participation, gradual withdrawal of public sector dominance, reducing tariff structures, allowing foreign investment and other such measures. One such policy measure introduced in the post 1990s relates to the plugging of loopholes in the existing Export Processing Zones (EPZs) structure of the country following the Chinese model of Special Economic Zones (SEZs). This is gaining increasing attention both due to indiscriminate land grabbing associated with it and more so on the count of the effectiveness of the policy itself. This particular policy initiative of the government has had the unique feature of being part of restrictive trade regime (since 1960s to 1990s) as well as the liberalization phase. In the midst, it has now been given the privilege of operating under a more liberalized trade, fiscal and administrative system as compared to the practice of being followed with respect to the other segments prevailing in other parts of the economic system. The underlying reason for placing such a system in place for these enclaves stems from two view points: One relating to improving the speed at

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which these enclaves have been functioning and the other to improving the efficiency and acceleration export growth.

It is important to note here that, efficiency, as a concept, is widely applied to evaluating the performance of different sectors of an economy, including the industrial sector. In the Indian context, a large number of studies have attempted to quantify the efficiency of Indian industries and the changes over the years covering a wide range of issues like the efficiency of Indian industries in the pre-reform period, the impact of New Economic Policy (NEP), Foreign Direct Investment (FDI) inflow, ownership pattern etc. Further, we have sector specific studies that analyse efficiency and its variations over the years and studies attempting to shed light on variations in terms of efficiency across major Indian states[i]. These studies explored both stochastic and parametric approaches with respect to the efficiency estimation issue. However, in the context of SEZs, there exist no studies that analyse efficiency aspect of these enclaves either within the SEZs or across zones over the period.

The issue of efficiency in the context of functioning of SEZ indisputably forms the core of policy goals. In the case of SEZs, the efficiency issues assumes greater prominence considering the special facilities extended to these enclaves, which in turn, are expected to set benchmarks in terms of performance standards and also because these are considered the engines of growth in the trade sector. In this context, it is important to explore the levels of efficiency of these enclaves in India and the related changes over the years, specifically to analyse the impact of SEZ policy intervention on the performance of these enclaves. It is possible that a zone may be quite ahead on the exports front in comparison to other zones but may be lacking in efficiency, with respect to the production process. On the other hand, a zone may account for a low level of exports in relation to other zones, but makes an optimum utilization of the input mix. Therefore, it is important to analyse the issue of efficiency with respect to these enclaves along with an outline of trends and patterns in the context of trade related performance.

In the context of SEZs, there are no studies available as of now, related to the analysis of efficiency. Probably, this is one among the very first attempts towards the estimation of efficiency of SEZs. The absence of studies in this area is not so much due to apathy towards the issue as to the difficulties involved in the estimation of efficiency of these enclaves. These are unique institutions with a specific incentive structure, considering that it is important that an appropriate framework is devised for estimating efficiency. In the present study, we have attempted to address some of the relevant questions, which strangely continue to remain unattended in the literature.

1. How to estimate efficiency of these enclaves, i.e., how to define output and inputs in the context of SEZs?
2. Can we score the zones on the basis of grade scores of efficiency?
3. Are there variations in efficiency across zones?
4. Whether efficiency ranking of each zone has remained unchanged over the years?
5. Whether the policy changes effected in the year 2000-01 have had any positive impact on efficiency scores?
6. What factors determine the efficiency scores across zones?

While keeping the above background in view, the paper has been organsied as follows. Second section provides a brief account of India's SEZ policy in retrospect. Third section elaborate on the methodology, model specification and data description of the present study. The profiles of all the seven conventional SEZs considered for the analysis, have been documented in the next section with a view to bringing out the specificities across zones. While estimation and discussion of the results relating to the technical efficiency of SEZs are presented in the fifth section followed by concluding remarks.

Making of the Indian SEZ Policy

SEZ Policy 'per se' is introduced in India after one decade of its reform process, in response to challenges raised due to the wave of liberalization initiated worldwide. The idea of setting up of SEZs came up in India from its phenomenal success in China. Accordingly, in the Export Import (EXIM) Policy Statement of 2000, the Government of India announced the setting up of SEZs (actually it was renaming of the earlier EPZs). It is well known that India had gone about creating a similar institution while establishing the first EPZ way back in the early 1960 as a careful approach towards designing an alternative port in the western coast of India as a substitute to Karachi Port, which India had lost at the time of partition (IIFT, 1990). Thereby, SEZ policy in India actually completed almost five decades besides going through two major phases of policy expansion. The *first phase* guidelines emerged while establishing the Export Processing Zones during the period 1960s - 2000. This could also be regarded as the pre SEZ regime as the earlier EPZs got metamorphed into the new SEZs with the new policy statement. This phase wittnessed a very cautious approach towards in the promotion with a few EPZs coming into existence. Further a strong presence of the license raj system and difficulties involved in accessing imports and exports made EPZs less attractive (Grasset and Landy; 2007). Besides, the State policy was not consistent in terms of attending to the supply side issues that had stunted their progress. For instance, the issue of ownership and its administration received scanty attention from the policy front in that until 1990s, all six EPZs were owned and managed by the central government. The process of reshuffling of the economic structure in the beginning of 1990s also had its impact on the operation and working of the earlier EPZs. Arora (2003 cited in Aggarwal, 2004, p-6) identifies nearly 146 circulars on EPZs/Export Oriented Units (EOUs) issued by different wings of the Government during this phase. Some of these major policy developments noticed included the extending of the working of EPZs from the traditional manufacturing sector to agriculture (1992) while allowing the private sector to operate (1994). Accordingly, Surat EPZ was set up in 1994 under the umbrella of private sector ownership. This was the beginning of a process towards the privatization of EPZs structures. It also symbolized a serious concern towards the restructuring EPZs through providing not only liberal incentive structures but also large areas for their operations.

Current SEZ policy forms the second phase of SEZs evolution in the country, enacted in two different phases: Initially all existing EPZs were first brought under the SEZs umbrella across two different periods. Accordingly, the zones of Kandla, Santacruz and Cochin were coverted into SEZs in the year 2000 followed by EPZs of Noida, Chennai, Falta and Vizag, in the year 2003. This was later extended to other SEZ projects in the country through fresh approvals[ii]. In India at present 122 SEZs

are operating (www.sez.nic.in)[iii]. Among these 19 SEZs had been notified prior to the enactment of SEZs Act (2005) in the country within which eight state supported EPZs were operating. State wise, the developed states like Maharashtra, Andhra Pradesh, Tamil Nadu and Karnataka have received more approvals while others account for only 33 per cent of the total approved SEZs in the country. Sector wise, on the other hand, IT/ITes/electronics industries have received maximum approvals in the country (61 %). Undoubtedly, the SEZ policy introduced in India in the recent past is definitely an improvement over the conventional EPZs of the country particularly in terms of the decentralization of administrative power from apex to zonal level, extending a business friendly atmosphere, allowing the role of respective state governments, promoting linkage effects and most importantly implementing a few of the recommendations of the trade committees of the late 1980s.. Thereby, it fulfills its promise of promoting a qualitative transformation from EPZs as envisaged in the EXIM Policy statement of 2000-01. Despite its numerous positive features the SEZ policy in India needs a pragmatic re-visit. The most important argument in its favour stems from the various flaws in the policy, which is in conflict with other development objectives of the economy.

Methodology

This paper while covering the period from 1986-87 to 2007-08 includes seven major conventional SEZs (converted from EPZ to SEZ) namely Kandla (KSEZ), Santacruz (SSEZ), Noida (NSEZ), Cochin (CSEZ), Madras/Chennai (MSEZ), Falta (FSEZ), Vizag (VSEZ). The required data has been obtained from the Development Commissioner (DC) Office of the respective zones. Of these seven, Vizag SEZ, setup in the year 1989-90, became operational in the year 1994. Thus, the present data relates to a panel of seven zones spread over 22 years. We have evaluated the efficiency of the zones by constructing a frontier function for SEZs at the national level by using data across zones as production units. Even though these zones may be producing different products, it is a common practice to construct a uniform production frontier for the manufacturing sector as a whole. The most important thing to be remembered with respect to these enclaves is that these are highly privileged industrial clusters mainly established for the promotion of exports. Thus analysing company specific efficiency does not reveal the efficiency of the zone as a whole and SEZ policy per se, and that would require construction of production frontier that takes a zone as a single production unit. Thus, our hypothesis focuses on investigating into the efficiency of SEZs in totality before getting into unit specific performance analysis and their variations. This paper also provides inter zonal differences within the framework of efficiency.

In order to estimate efficiency, it is necessary define the production frontier with respect to SEZs. A frontier usually consists of output and a mix of input variables measured in terms of market prices. In this connection, one has to appropriately define output and inputs in the context of SEZs. The production function we have considered in the present analysis is a modified formulation of the standard production function. Conventional theory defines production as follows.

Output = f (Labour, Raw Material, Capital Stock) ..... (1)

In this, both output and inputs are measured in terms of market prices. Whereas, in the case of SEZs, there is no concept of output, rather exports need to be considered as the total (effective)

output. The very philosophy of SEZs is that the entire output produced by these enclaves is for exportation. Thus, the first assumption relates to the equating of all exports generated by SEZs as gross value of output. On the input side, we have considered the total number of labourers employed in each zone over the years, the import of raw material and capital goods each year. Thus in the context of SEZs, the efficiency of a zone refers to the capability of a zone to produce the maximum possible output (exports) utilizing the liberalised import regime and the supporting mechanism provided by the policy. Thus, it is possible that a zone may not be in the forefront in terms of higher exports earning as compared to other zones, but it is in position to produce an optimum output/exports given the supporting mechanism available with each zone and the liberal import regime. Similarly, a zone while accounting for the highest export earnings in comparison to others may still be below its optimum production capacity. Thus, there may exist contradiction between the export performance of a zone and its efficiency score. We have employed a Cobb-Douglas production function in the present analysis[iv]. As given in the literature it scores on simplicity while facilitating a better understanding with least technicalities. The estimable form of the model is as follows.

$$\mathbf{Ln\ (X_{it}) = a + b_1 ln\ L_{it} + b_2 lnR_{it} + b_3 lnCG_{it} + v_{it} + \mu_{it}} \quad \text{..... (2)}$$

Beside, obtaining efficiency estimates, it is equally important to analyse the factors influencing efficiency of these enclaves. Inefficiency is the converse of this measure. For this purpose, we have recognized a set of variables, which might be helpful in explaining the determinants of inefficiency. To identify the determinants of inefficiency we have adopted the procedure as given by Battese and Coelli (1995). The model specification is:

$$\mathbf{\mu_{it} = d_0 + d_1 ln\ AZ_{it} + d_2 lnDU_{it} + d_3 lnGi_{it} + d_4 PolicyDummy + W_{it}} \quad \text{..... (3)}$$

In the model,

X, represents the Rupee value (at Constant Prices) of exports of zone i in the year t; RM, represents the value of Raw Material Imports (the Rupee value at Constant Prices) of zone i in the year t; L, stands for the total Labour employed in the zone i in the year t; CG, denotes Capital Goods Imports of zone i in the year t; V_{it} are random variables, assumed to be independently and identically distributed (IID) with N (O,σu^2); W_{it} are non negative random variables which are assumed to account for export inefficiency and also are assumed to be independently distributed with mean it and variance σu^2; AZ_{it} is the Total Area of zone i in the year t; DU_{it} denote It is Concentration of units of zone i in the year t (Ratio of exporting units to the area of a zone. This captures clustering of units); Gi_{it} is Government investment of zone i in the year t; Policy Dummy: (Dummy variable (0= for EPZs and 1 for SEZs period) to capture policy changes occurring in the year 2000-01; i= 1,2, 3, 4, 5, 6, 7 is zone and; t = 1985-86, 1986-87,..... 2007-08 is the time period under consideration; ln denotes natural logarithm

Description of Variables

Total Exports

We have taken total exports as a measure of output. It is expressed in value terms at constant prices (1999-2000). This consists of total exports and domestic sales, considered as deemed exports.

Capital Goods and Raw Material Imports

In the present exercise, we have considered the total imports classification under the head of capital goods (CG) and raw materials (RM). Raw Material import represents the consumption of raw material in a zone. On the other hand, Capital Goods import symbolizes the stock of capital goods added every year in the zone. Thus it is a flow concept.

Labour

It denotes the total number of directly employed labourers in each zone over the years.

Size of the zone

The size of a zone in terms of its spatial spread should not have any impact on the total volume of trade transacted except in a situation where in such an expanse is utilized optimally for spreading the number of units exporting out of the SEZ. However, of late, there has been an intense debate on SEZs promotion and land requirements, and thus the size and its relation to the volume of exports form the core of the debate. A few support a large-scale promotion of these zones on the lines of Chinese SEZs, while a few others nullify the former argument in that and they favour small size enclaves. In the present exercise, we have taken seven zones with the size ranging from 103 acres to 1000 acres. In order to examine the differing ideological arguments with regard to the geographical spread we have taken into consideration the geographical size of every zone in an attempt to understand whether the efficiency of a zone is in any way related its size. We expect that geographical size of a zone is positively related to its efficiency particularly with respect to availing of the economies of scale.

Concentration of Units

The concentration of units is represented by the ratio of the number of exporting units to the total area. Over the life of the SEZ, there has been a gradual increase in the number of exporting units, given the size of a zone. It has resulted in a gradual increase in the concentration of exporting units i.e., the formation of clusters/agglomerations of units. It would be quite interesting to analyse whether such clustering of units has had any impact on the efficiency of a zone, as, in the case of a better performing zone, the density of units is relatively higher than a less performing zone. Thus, we hypothesize that the concentration of units in a zone has a positive impact on its aggregate efficiency.

Government Investment

Seven zones considered here are essentially Government (Central) owned zones and all the investment in infrastructure in these is made through the Government sources as against the upcoming private zones where in the private developers make such investments. Thus, we have taken into account the total Government investment (including both revenue and capital) on various infrastructure and administrative reforms with a view to analysing the corresponding responses in exports and we expect a positive sign for this indicator. There is a word of caution needed here in that the Government investment per se cannot be used as a proxy for private investment as the quality and efficiency may differ.

Dummy Variable for Policy Changes

In the year, 2000-01, the SEZ policy incorporated on the existing EPZs in the country. This was carried out through improved institutional, incentives and administrative arrangements. In order to capture whether a shift in policy perspective has had any impact on the overall export performance, we have used a dummy variable. It represents value 0 for EPZs period (1986-87 to 1999-2000) and one for SEZs period (2001-01 to 2007-08). We expect positive sign for the dummy variable.

Mapping of SEZs Economic Profiles

Before we proceed further towards the efficiency analysis, it would be quite interesting if we get acquainted with a few basic economic characteristics of the seven enclaves considered for our analysis. This also helps sketch the variations in terms of basic indicators across these zones. Based on the value of exports (Table one) available for the latest year (2007-08) Santacruz and Noida are at the top in cross-section ranking. These two zones together constitute about 58 percent of the total exports from these seven zones. This is quite contrary to the scenario that prevailed in the year 2000-01, when in the year 2000-01 Santacruz and Falta together had accounted for about 69 percent of the total exports.

Table 1: Ranking of Zones Based on Value of Exports for Selected Years

2000-2001			2007-2008		
Ranking	**Zone**	**Exports**	**Ranking**	**Zone**	**Exports**
1	SEEPZ	4864.90	1	SEEPZ	6802.56
2	VSEZ	1956.67	2	NSEZ	5595.46
3	NSEZ	968.72	3	CSEZ	3504.90
4	MSEZ	646.31	4	MSEZ	2296.08
5	KSEZ	493.63	5	VSEZ	1535.69
6	FSEZ	487.03	6	KSEZ	1461.08
7	CSEZ	285.03	7	FSEZ	429.12

Source: Based on the data collected from Seven Conventional SEZs Development Commissioners Offices

Note: Values in Rs Cores at Constant Prices (1999-2000)

The scenario of SEZs performance across zones varies when analysed in terms of the number of exporting units. Accordingly, Santacruz and Kandla SEZs are ranked as first and second respectively with respect to the exporting units for the latest year available (Table two) for which, Kandla SEZ is found to have replaced the position of Falta SEZ as compared to the year 2000-01.

Table 2: Ranking of Zones Based on the Number of Exporting Units for Selected Years

2000-2001			2007-2008		
Ranking	**Zone**	**Units**	**Ranking**	**Zone**	**Units**
1	NSEZ	146	1	SSEZ	290
2	FSEZ	111	2	KSEZ	169
3	KSEZ	109	3	NSEZ	162
4	SSEZ	103	4	FSEZ	128
5	MSEZ	86	5	MSEZ	111
6	CSEZ	51	6	CSEZ	82
7	VSEZ	16	7	VSEZ	43

Source: Based on the data collected from Seven Conventional SEZs Development Commissioners' Offices

Santacruz SEZ has slipped from the first position in the year 2000-01 to the fourth position in the year 2007- 08 in terms of per unit exports (Table three). This is quite contradictory to the scenario analysed within the framework of exports value and exporting units, wherein Santacruz SEZ is found to have stayed at the first position. This could be due to the entry of a large number of new exporting units in the early stage of production over the last few years, currently with a relatively less exports potentiality. Cochin followed by Vizag SEZs have recorded the highest value in terms of per unit exports for the latest year available (Table three) as these zones have experienced a less increase in the number of exporting units as compared to other zones.

Table 3: Zone Ranking Based on Per Capita Exports for Selected few Years

2000-2001			2007-2008		
Rank	**Zone**	**Per Capita Exports**	**Rank**	**Zone**	**Per Capita Exports**
1	SSEZ	47.23	1	CSEZ	42.74
2	VSEZ	12.29	2	VSEZ	35.71
3	MSEZ	7.52	3	NSEZ	34.54
4	NSEZ	6.64	4	SSEZ	23.46
5	CSEZ	5.59	5	MSEZ	20.69
6	Kandla	4.53	6	Kandla	8.65
7	FSEZZ	4.39	7	FSEZZ	3.35

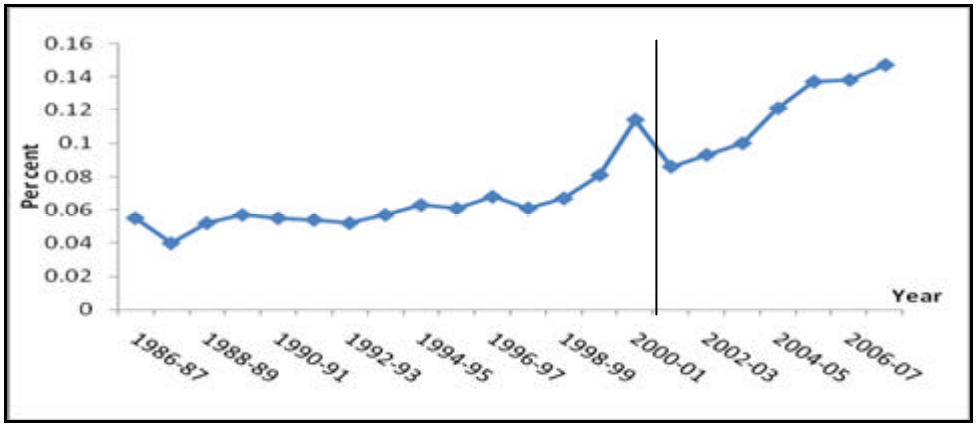
Source: Based on the data collected from Seven Conventional SEZs Development Commissioner Office

Note: Values in Rs Cores at Constant Prices (1999-2000)

This basic description, however, leaves us unclear about the status of better performing zones. Moreover, this kind of analysis cannot provide any indication on the state of efficiency of these enclaves as argued above that there might be situations in between the better exporting zones and an efficient zone. The trade-off between the volume of exports and the level of efficiency may be of great interest.

One of the conventional methods for assessing the efficiency of a production unit is the estimate labour productivity. This is simply a ratio of output to the number of laborers and explains output per unit of employment. Considering exports as an output, we have estimated labour productivity of these enclaves (results are presented in Table four). The labour productivity of these enclaves ranges from 0.04 crore Rupees to 0.15 crore Rupees over the last 22 years (Figure one). There is a significant increase observed of it over the years, specifically the one during the SEZs period.

Figure 1: Average Labour Productivity of SEZs Over the Years



Source: Computation based on Data collected from respective DCs' offices

It is noted that for the latest available year, the labour productivity of Vizag followed by Cochin SEZs is the highest, though it is below 0.50 crore Rupees. However, over the years, we have noticed substantial fluctuations in the labour productivity of these zones. For instance, in the case of Kandla, on an average, its labour productivity for the year 2007-08 corresponds to the one for the year 1986-87; however, Kandla SEZ is found to have witnessed a fall in its labour productivity in the post 1990 and then gradually picking up after 2000-01. All other zones also have shown signs of improvement over the years.

It would be interesting here to idntify average labour productivity for EPZ (1986-87 to 1999-2000), and the current SEZ periods (2000-01 to 2007-08) and also for the entire reference period covering both EPZ and SEZ structures. This helps us find out whether the introduction of SEZ policy in place of the conventional EPZs structure across the country whether has had a significant and positive impact on labour productivity scores of SEZs. Results presented in table five indicate that on an average the introduction of the SEZ policy in place of the conventional EPZs structure of the country has had a significant and positive impact on labour productivity scores of SEZs. Despite this, labour productivity of SEZs remains quite low, calling for some corrective measures for tackling the issue. Although the evaluation of labour productivity throws some light on the performance level of an economic unit, in this case SEZs, it provides only a partial picture. Further, it is quite necessary to have an integrated approach, functioning in all the major inputs of production as against output, towards assessing the issue of efficiency. We next intend to take up the issue of performance by considering major inputs, using the efficiency concept.

Table 4: Trends in Labour Productivity Across Zones

	KSEZ	SSEZ	MSEZ	CSEZ	NSEZ	FSEZ	VSEZ
1986-87	0.076	0.037	0.039	0.046	0.019	0.000	NA
1987-88	0.056	0.035	0.016	0.030	0.020	0.080	NA
1988-89	0.063	0.051	0.046	0.012	0.020	0.188	NA
1989-90	0.071	0.058	0.037	0.017	0.031	0.229	NA
1990-91	0.084	0.058	0.027	0.004	0.021	0.164	NA
1991-92	0.072	0.067	0.035	0.015	0.027	0.116	NA
1992-93	0.029	0.094	0.031	0.022	0.045	0.028	NA
1993-94	0.042	0.103	0.028	0.026	0.047	0.035	NA
1994-95	0.048	0.117	0.029	0.027	0.050	0.027	NA
1995-96	0.049	0.103	0.035	0.025	0.045	0.017	NA
1996-97	0.040	0.103	0.073	0.039	0.040	0.019	NA
1997-98	0.041	0.090	0.060	0.039	0.037	0.029	NA
1998-99	0.039	0.111	0.030	0.043	0.046	0.035	0.028
1999-00	0.053	0.134	0.030	0.050	0.050	0.112	0.054
2000-01	0.049	0.139	0.049	0.059	0.050	0.189	0.586
2001-02	0.048	0.118	0.053	0.051	0.047	0.307	0.176
2002-03	0.078	0.104	0.065	0.055	0.048	0.164	0.310
2003-04	0.089	0.133	0.059	0.065	0.064	0.229	0.144
2004-05	0.081	0.134	0.069	0.092	0.147	0.124	0.228
2005-06	0.058	0.138	0.080	0.180	0.183	0.105	0.435
2006-07	0.080	0.137	0.088	0.181	0.157	0.108	0.480
2007-08	0.077	0.148	0.083	0.308	0.169	0.110	0.445

Source: Respective DC offices

Note: Values are in Rs Cores at Constant prices (1999-2000)

Table 5: Average Labour Productivity under Major Policy Regimes

	KSEZ	SEEPZ	MSEZ	CSEZ	NSEZ	FSEZ	VSEZ	All SEZs
1986-87 to 2007-08	0.060	0.101	0.048	0.063	0.062	0.110	0.289	0.080
1986-87 to 1999-00	0.055	0.083	0.037	0.028	0.036	0.077	NA	0.059
2000-01 to 2007-08	0.070	0.131	0.068	0.124	0.108	0.167	0.350	0.117

Source: Based on Table 4

Note: Values are in Rs Cores at Constant prices (1999-2000)

Technical Efficiency of SEZs – Aggregative Scenario

We have computed Technical Efficiency (TE) scores for each year for different SEZs and an average TE score across seven SEZs that are presented in the last column of table six. We have observed that the average TE of SEZs, over the reference period, ranges from 0.31 percent to 0.75 percent. Moreover, the average efficiency score of all SEZs for over 22 years is found to be 0.53 percent. This suggests that, on an average, SEZs are 53 percent efficient with respect to optimally produced output/exports with a given mix of inputs as compared to the best practicing SEZs. This also implies that it would be possible to improve the efficiency of SEZs by about 47 percent with a given mix of inputs. This, however, throws up a broader question on the efficiency with which the resources available with these enclaves are being utilized towards meetings their objectives. As Hill and Kalirajan (1993), in some other context, argue that a plant or an industry can be considered technically efficient if its TE score is not less than 75 percent. If we analyse the technical efficiency of SEZs within this parameter one can observe that these enclaves are highly inefficient at the aggregate level. Or else, it also raises a question, whether it demands a different threshold level for measuring efficiency? If so what it could be.

Table 6: Trends in Technical Efficiency Scores of SEZs over the Period

	KSEZ	SSEZ	MSEZ	CSEZ	NSEZ	FSEZ	VSEZ	ALL SEZS AVERAGE
First Phase of EPZs Expansion								
1986-87	0.46	0.39	0.19	NA	0.31	NA	NA	0.34
1987-88	0.45	0.38	NA	NA	0.27	NA	NA	0.37
1988-89	0.48	0.41	0.32	0.16	0.30	NA	NA	0.33
1989-90	NA	0.45	0.30	0.20	0.35	0.23	NA	0.31
1990-91	0.55	NA	0.34	0.19	0.41	0.25	NA	0.35
Second Phase of EPZs Expansion								
1991-92	0.50	0.50	NA	0.26	0.40	0.34	NA	0.40
1992-93	0.45	0.56	0.41	NA	0.44	0.24	NA	0.42
1993-94	0.53	0.58	0.56	0.37	NA	0.28	NA	0.46
1994-95	0.54	0.62	0.49	0.34	0.48	NA	NA	0.49
1995-96	0.59	0.60	0.46	0.32	0.52	0.34	NA	0.47
1996-97	NA	0.67	0.47	0.39	0.51	0.27	NA	0.46
1997-98	0.60	NA	0.48	0.35	0.52	0.28	NA	0.45
1998-99	0.56	0.76	NA	0.37	0.55	0.36	NA	0.52
1999-00	0.60	0.73	0.49	NA	0.61	0.54	0.26	0.54
SEZs Regime								
2000-01	0.79	0.80	0.60	NA	0.71	0.78	0.81	0.75
2001-02	0.61	0.84	0.54	0.49	NA	0.82	0.42	0.62
2002-03	0.68	0.79	0.55	0.60	0.63	0.74	0.46	0.64
2003-04	0.69	0.83	0.56	0.60	0.72	0.86	0.36	0.66
2004-05	0.73	0.86	0.57	0.57	0.70	0.82	0.35	0.66
2005-06	0.74	0.87	0.73	0.63	0.74	0.62	0.46	0.69
2006-07	0.79	0.85	0.73	0.64	0.75	0.60	0.50	0.69
2007-08	0.78	0.87	0.67	0.63	0.76	0.61	0.52	0.69

Technical Efficiency at the Disaggregate Level and under Different Policy Regimes

At the disaggregate level, across time-periods, Santacruz is found to be high on the efficiency scores, with an average TE score of 0.67 percent. On the other hand, with 0.42 percent TE score, Cochin SEZ is the least on the efficiency score (Table seven). The scenario changes significantly, when we analyse TE scores across zones under the major policy regimes.

Table 7: Average TE Scores under Major Policy Regime

	KSEZ	SSEZ	MSEZ	CSEZ	NSEZ	FSEZ	VSEZ	ALL SEZS
1986-87 to 1999-2000	0.53	0.55	0.41	0.30	0.44	0.31	NA	0.42
2000-01 to 2007-08	0.73	0.84	0.62	0.59	0.72	0.73	0.49	0.67
1986-87 to 2007-08	0.61	0.67	0.50	0.42	0.53	0.50	0.46	0.53

The trends in TE scores reveal that, on an average it is found lower for the policy governing EPZs across all the zones (Table six and seven) as compared to the corresponding values for the SEZs period. During the EPZs period, the average TE score is found to be below 40 percent for all zones till 1990s. The scenario changes significantly revealing an upward trend in the second phase of EPZs expansion, i.e., the post 1990s. Among the seven zones, Santacruz and Kandla SEZs are observed to have better efficiency scores than other zones operating on the same frontier (During EPZs period). The average TE scores for the EPZs period as a whole (1985-86 to 1999-00) are below 0.50 percent, thus indicating a gloomy picture of EPZs performance not only with respect to promoting exports but also efficiency with which resources are being utilized.. In fact, like most of the other policy initiatives of the Government of India during the pre-reform period, EPZs regime also turned out to be of the inefficient segment of the economic systems. However, TE scores for the SEZ period, on the other hand, are found have increased substantially across all zones; as a result, the average TE score for this period stands at to 0.67 percent. A comparison of the same figure with that of EPZs, indicates, an increase of TE efficiency scores by almost 25 percent after the introduction of SEZ policy in the country. This can also be interpreted as a substantial reduction in inefficiency across seven zones during the SEZs regime. On the face of it this justifies the Government's initiatives in strengthening the SEZ policy, considering the enhanced exports earnings and improved efficiency scores of these enclaves. Despite the fact, TE score of zones again below 75 percent, which in the literature considered as threshold level for measuring technical efficiency or inefficiency. Thus it emphasizes the need for further disciplining the SEZs structure specifically through a better understanding of the problematic areas/difficulties involved in their operations, rather than just extending liberal fiscal code.

At the disaggregate level, for the current SEZs period, the TE score for Santacruz contributes 0.84 percen, implying that among the seven zones, Santacruz SEZ has remained relatively better off in terms of efficiency. This is followed by the TE Scores in respect of Kandla, Falta and Noida SEZs. It may be noted that in terms of the total value of exports as well as per unit exports FSEZ takes the last rank (Tables one and two), whereas, in terms of efficiency scores it better than NSEZ, MSEZ, CSEZ and

VSEZ, thereby revealing a contradiction in the ranking of zones based on export earnings per se, which in turn indicates a discrepancy existing between higher export earnings and optimum exports earning thus raising an important issue pertaining to the appropriateness of the measurement tool for evaluating these enclaves in the process.

The Determinants of Inefficiency Scores

The determinants of efficiency score besides holding significant policy implications can help correct aberrations if any. The area allocated to SEZs is one of the major issues being debated across the country that needs to be attended to in the first plane. Given the experience of the well established SEZs and their relatively good performance, the impact of the expanse of a zone can help understand the logic underlying the sanctioning of land to SEZs. On an average, the SEZs in the analysis hold 100 hectares to 1000 hectares of land. It is usually expected that larger the spread of land, higher will be the export efficiency of SEZs. This assumption has gained acceptance in our analysis. Our analysis indicates that the area spread of a zone has a negative sign and is statistically significant with respect to inefficiency, thereby indicating that the converse of it has a positive relation with efficiency scores (Table eight). This supports the argument in favour of promoting large size SEZ in order to avail of economies of scale. The concentration of units reveales both significant and negative signs with respect to technical inefficiency indicating the presence of agglomeration/cluster of exporting units within a zone that have a significant impact in terms of improving the efficiency of a zone. As we can notice from Table two, there has been a significant increase in the number of exporting units across zones during SEZ period, thereby supporting our results obtained by way of inefficiency estimation. Government investments, on the other hand, have turned negative but exhibit an insignificant relation with respect to technical inefficiency. This is quite contradictory to our expectations. However this offers an inconclusive inference with regard to government investments and efficiency of SEZs. All the same, this indicates that government efforts to improve and provide world-class infrastructure within these zones have a positive influence in terms of shaping efficiency estimation of these enclaves. It can be seen that efficiency scores of SEZs have increased during the current SEZs period in line with the government efforts towards increased investment on infrastructure; even though it cannot be proved empirically as it does not emerge statistically significant. Lastly, the dummy variable capturing the impact of policy changes on efficiency of these zones has turned out to be statistically significant but with a negative sign with respect to technical inefficiency. This indicates that changes in the policy initiative have a favorable effect on technical efficiency scores of zones, thereby implying that the government efforts (in the form of policy measures) in terms of shifting the focus from conventional EPZs to SEZs have been quite useful not only in improving trade performance but also encouraging the efficient use of resources in the production process in relation to an optimum level of output. This has also been substantiated in terms of TE scores, which, on an average, demonstrate higher values during the SEZs regime as compared to the EPZs structure.

Table 8: Determinants of Exports Inefficiency

Parameters	Estimated Parameters Values
Constant	3.45 (5.15)*
Area of Zone	-0.247 (-3.59*)
Clustering/Concentration of Units	-1.5 (-4.42)*
Government Investment	-0.064 (-1.258)
Dummy	-0.27 (-3.12)*

Note: Figures in parenthesis are t values; *refers significance at 1 percent level

Conclusions

The special enclaves in India have witnessed significant changes over time with respect to the policy environment over the last five decades. During this period, these enclaves operated under both restrictive trade and in a liberalized policy regime. Meanwhile, based on learning from Chinese SEZs, a major policy shift was introduced in the year 2000-01. Here, we have attempted to analyse the effectiveness of SEZ policy over EPZs structure within the framework of efficiency scores and we have also defined 'Efficiency' in somewhat a different functional form from what the conventional theory suggests.

The analysis carried out above in respect of the seven conventional SEZs indicates that policy changes effected in the year 2000-01 have had a significant impact on output/export efficiency of SEZs. As a result, the average TE score of these enclaves have increased by almost 25 percent during the SEZs period as compared to the EPZs regime. Of the seven conventional SEZs, the performance of Santacruz and Kandla SEZs has turned to be relatively better than the other zone operating within the same production frontier (For the entire reference period). The low efficiency scores during the EPZs period could be attributed to the general macro economic environment, with restrictions imposed on the operational structure of these enclaves. A significant upward trend in efficiency estimation in the post 1990s has been noticed; in that the efficiency scores show a sign of improvement after the enactment of the SEZ policy in the country. Moreover, during the EPZs period, there were very few exporting units operating in each SEZ (Table two). This in turn resulted not only in the underutilisation of area available with each zone but also the government investments. This fact stands confirmed while analysing the determinants of inefficiency. Here we have found that the area of a zone is positively related to efficiency scores. Thus the argument in favour of promoting large size SEZs, as an engine of growth, and improving their efficiency receives support from our analysis. This however, needs to be interpreted carefully. No doubt, this implies the presence of economies of scale in the operation of SEZs. This, however, is not the sole factor in terms of shaping efficiency of these zones. Because, just allotting large areas to SEZs may not yield the desired results. Along with this, the clustering of units contribute positively as it can be seen that for the SEZs period, Santacruz and Noida SEZs show high TE score as compared to Kandla and Vizag SEZs which are relatively bigger in size. This is in line with a higher growth rate observed in respect of exporting units of Santacruz and Noida SEZs as compared to other

zones. Government investment, as a developer has been found positive and statistically insignificant. This, in turn, encourages investment from other actors involved in the process. Despite a steady improvements in efficiency score during the current SEZs expansion, it is quite low. This, in turn, indicates that their exists scope for further disciplining as well as revamping SEZs structure towards improving efficiency levels of these enclaves. This could be carried out through an in-depth analysis of problems and prospectus of each zone, rather than following a uniform policy applicable to all zones.

On the limitations count, the present study has used the Cobb-Douglas Production Function. Because of limited number of observations, it has not been possible for us to adopt a translog version of technical efficiency estimation. Further, we have addressed the issue of efficiency of SEZs as part of the trade policy at the aggregate level. One can further investigate the existing scenario at the disaggregate level, specifically in terms of the unit specific efficiency of each SEZs.

Notes

[i] See for instances Goldar (1985), Bhavani (1991), Ray (2002), Parameshwaran (2002), Goldar et al., (2003), Kambhampati (2003), Trivedi (2004), Mukherjee and Ray (2004), Bhandari and Maiti (2007) and others.

[ii] Tantri (2010) categorises operational SEZs of the country into conventional SEZs and modern SEZs. SEZs those having their origin in the EPZs structure, and operating even before the enactment of SEZs policy in the country are known as conventional SEZs. Modern SEZs, on the other hand, are those that have been approved and have become operational after the enactment of SEZs policy in the country. We have followed the same approach in the present analysis.

[iii] Excerpted on 20th January, 2011

[iv] In view of the small number of observations, the available data does not permit employing translog Production function, which is known for its flexibility. Here we have employed Cobb Douglas Production Function following the argument of Madalla (1979) that TE measurement is quite insensitive to the functional form of production frontier.

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