

## **PERFORMANCE ANALYSIS OF SMALL SCALE INDUSTRIES - A STUDY OF PRE-LIBERALIZATION AND POST-LIBERALIZATION PERIOD**

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#### **—Abstract —**

The role of small-scale industries has always been supported in a country like India with various opinions such as employment, equality, latent resource, trickling effect, insurance against social tension, distributive effect, creation of social eco-system and decentralization etc. The other arguments in favor of this are making provision for self-employment and capital formation. Study of SSIs has received many responses from various economists. The performance of the small-scale sector has a direct impact on the growth of the overall economy in terms of number of units, production, employment and exports. It may help to understand its role in the economic development of the country.

**Key Words:** *SSIs, Production, Employment, Exports, GDP.*

**JEL Classification:** L10 - General

## **1. INTRODUCTION**

Small-scale industries have played a very important role in the development of country. The government in its budget normally emphasizes on the contribution of the small and medium scale enterprises. The role of small-scale industries has always been supported in a country like India with various opinions such as employment, equality, latent resource, trickling effect, insurance against social tension, distributive effect, creation of social eco system and decentralization etc. The other arguments in favor of small-scale industries are making provision for self-employment and capital formation and they are skill light, import light and quick yielding. Analysis of the data on SSIs has received different responses from different economists in different studies, right from one of the earliest studies in 1961. The performance of the small-scale sector has a direct impact on the growth of the overall economy. The performance of the small scale sector in terms of

parameters like number of units, production, employment and exports will help to understand its role in the economic development of the country.

## **2. LITERATURE REVIEW**

There have been a lot of studies that has been undertaken on entrepreneurship and small-scale industries. The major studies focus on the argument over the issue of efficiency in the small-scale industries vis-à-vis large-scale industries. Dhar and Lydall (1961), Sandesara (1954) in their study have found out that the small scale industries are generating less amount of employment vis-à-vis large scale industry. These small-scale industries in the modern times have become more capital intensive rather than labour intensive. Biswanath Goldar (1988) in his study on productivity of the small scale sector found out that the SSIs have low labour productivity while capital productivity is very high. But the overall total factor productivity has been less. Goldar in his studies also further emphasized that the SSI should not be relied upon as a source of efficient employment generation. Ramsingha K Asher (1987) showed that the value added by a rupee worth of fixed investment in small factories is at least three times as large as that for a large factory. This has also been supported by a recent study by SIDBI and NCAER (1999).

Some of the studies have been undertaken on the factors that are proving a hindrance to growth of these small enterprises promoted by various entrepreneurs. Clacy and Lakhmakker (1994) in their study have found out that the small-scale industry freedom to choose gets effected in response to the fierce competition. Technology deployed by small-scale units has been static in spite of the availability of improved technologies on the Indian market. The likely reasons for this are lack of operational and investment capabilities, unwillingness to invest, lack of capabilities to engage in technology search, improvements etc. Investment in ICT has a negative impact on labour productivity and a positive impact on general market expansion. However, such investment does not have any significant impact on enterprises' return, nor does it determine enterprises exporter (non-exporter) status (Shyamal K. Chowdhury and Susanne Wolf (2003). Sebastian Morris, Rakesh Basant (2006) in their study found out that small firms bear a very heavy burden in dealing with government. There is a need to come out of the inspector raj syndrome to simplify the umpteen laws and regulation ranging from Labour Compensation Act to the Unionization Act, which needs to be merged. Many specific macroeconomic policy-induced distortions work against the small-scale sector such as tariff inversion, conservative monetary policy, non-aggressiveness of exchange rates, tight credit , perverse incentives in banks, erroneous Sickness Data, underdeveloped venture capital incentive, reservation etc.

## **3. SIGNIFICANCE OF THE STUDY**

The limited literature review shows that small-scale industry development is dynamic and a comprehensive one-time study is not possible, which explores the causal relationship among the variables that help in judging the performance of the small-scale industries for all times. In this study the authors have tried to find the causal relationship among the three variables GDP, SSI out put and SSI exports and also have compared the performance parameters in the pre and post liberalization era.

#### 4. OBJECTIVES OF THE STUDY

The specific objectives of the study are:

- To evaluate the performance of the small scale industries taking into account the parameters like employment generated, exports, number of units and productivity per employee in the pre-liberalization and post-liberalization period.
- To test the bi-directional causal relationship between exports of SSI with GDP, and total output in SSI with GDP.

#### 5. RESEARCH METHODOLOGY

The study is based on the data on Number of units , total production, productivity per employee, small scale exports and GDP compiled from the secondary sources i.e. Handbook of Statistics on The Indian Economy, Reserve Bank of India, 2004-2005. The study is based on the data available for the period 1973-2005 for performance evaluation of Small Scale Industries.

**5.1. Variables:** Units (in Lakhs) of small-scale industries as defined from time to time

Production (Rs. Crores) at current prices

Employment (Lakh Nos.)

Production per employee (Rs. in thousand) at 1993-1994 prices (PPE)

SSI Exports at current prices (Rs. Crores)

**5.2. Statistical Tools:** The following statistical tools have been used in the study.

- a) Semi-log model to calculate CAGR
- b) Unit root test to test the stationarity
- c) Granger causality to test bi-directional casual relationship
- d) Annual Average growth rate

a) **Semi – log model:** The compound growth rate of each variable has been calculated using semi-log model.

Semilog model:  $Y_t = Y_0(1+r)^t$

Where:  $Y_t$  = Value of the response variable at time t,

$Y_0$  = Value of the response variable at the beginning,

r = Rate of growth of the response variable

$u_t$  = random disturbance term

By regressing  $\ln Y_t$  on t, the estimated value of the growth rate r can be obtained. The coefficient of determination  $R^2$  is calculated to know the proportion of the total variation explained by the regression. Lastly t-test has been done to know the significance of regression.

b) **Unit Root test:** The unit root test is undertaken to test the time series properties of the annual data. The stationary problems of all the variables are examined by testing for unit roots using standard Dicky Fuller test. This was further confirmed by the Philips Perron test, which proposes a non-parametric method of controlling for higher order serial correlation in a series. This stationary tests are significant in the light that non-stationary regression model invalidates standard results.

c) **Granger Causality:** The dynamic linkage is examined using the concept of Granger (1969) causality. The Granger causality procedure is applied to determine the direction of causation among the variables. The causality procedure is based on bivariate system (x,y) formally, a time series  $X_t$ , Granger causes another time series  $Y_t$  if series  $Y_t$  can be predicted better by using past values of  $(X_t, Y_t)$  than by using only the historical values of  $Y_t$ . In other words,  $X_t$  fails to Granger cause  $Y_t$ .

d) **Average Annual Growth Rate:** This is obtained by finding out the average of the each year's annual growth rate.

### 5.3. Limitations of the study

Insufficient database for small-scale industry is one of the major limitations of the study. The data are not available for all the years. The census for the SSI has not been conducted after 2003. The two major sources of information, viz., Small Industries Development Organization (SIDO) and CSO provide estimates of information based on partial returns and information on unregistered small-scale units is based on estimation is a obvious limitation for all research in this area.

## 6. OBSERVATION

**For the period 1973-2003:** From the table (1), it is observed that the compound annual growth of SSI units, output (in terms of money), employment and SSI exports has been 14.18%, 12.87%, 6.74%, 21.28 % respectively with the exception of a very low growth rate in the production per employee at 1.48%. The t-values of all the growth rates are significant except for the growth rate of PPE. The obtained  $R^2$  are also satisfactory except for PPE.

**Table 1: Compounded growth rates for the period 1973-2003**

Items	CAGR	T values (Calc)	$R^2$
No. of Units	14.18	16.59*	0.89
Total Output	12.87	28.61*	0.96
Employment	6.74	38.81*	0.98
Production per employee (PPE)	1.48	-2.59	0.18
SSI Exports	21.28	51.68*	0.98
GDP	14.01	101.11*	0.99

\* Significant at 1% level of confidence

Compound Annual Growth of the parameters of SSIs during 1973-1990 and in the sub-period 1991-2003 (post-liberalization period)

**Table 2: Compounded growth rates for the period 1973-1990**

Items	CAGR	T values (Calc)	R <sup>2</sup>
No. of Units	11.63	9.18*	0.84
Total Output	19.4	66.49*	0.99
Employment	7.24	29.87*	0.99
Production per employee	3.66	13.70*	0.92
SSI Exports	18.66	29.33*	0.98
GDP	13.22	55.75*	0.99

**Table 3: Compounded growth rates for the period 1991-2003**

Items	CAGR	T values (Calc)	R <sup>2</sup>
No. of Units	11.64	9.18*	0.84
Total Output	18.098	23.88*	0.97
Employment	7.54	27.75*	0.97
Production per employee (PPE)	1.80	1.67	0.14
SSI Exports	19.12	31.05*	0.98
GDP	13.40	57.51*	0.99

\*Significant at 1% level of confidence

The above tables (2 &3) indicate that the compound annual growth rate of units of SSI during 1973-1990 is little less than the CAGR of the same in the post-liberalization era. But total output has grown at 18.098% in the post-liberalization era as compared to 19.4% in the pre-liberalization period, indicating greater productivity per unit of small-scale enterprise in the previous period. It is being further supported by the fact that the CAGR of productivity per employee is at 1.80 % in the post-liberalization period whereas it was 3.66 % in the pre-liberalization period. The growth of SSI Exports has been 19.12% after 1991 whereas it was little less at 18.66% during 1973-1990. It might be attributed to government initiatives taken to promote exports in recent years. Comparing the CAGR of different parameters in two sub periods, we can conclude that there has not been any significant change in the performance of small scale enterprises despite a number of policies, schemes initiated by the government after 1991.

Possible rationalizations for lower employee productivity are as follows:

- Techno-driven SSIs have graduated to large industries and only labour intensive SSIs are left to flourish under the sector. Employee productivity does not enjoy the leverage of graduated technology;

- There are frequent changes to the definition of SSI, some due to changing dimensions at market place and some due to politico-legal compulsions. Such changes in definition results in changes in base of computation. This confounds the quantitative inferences.

A better measure would have been per rupee wage productivity rather than per employee productivity. But accurate data on employee wage bill is not consolidated, which is a limitation of the study. Post-liberalization deceleration of CAGR has similar rationalization pattern viz:

- The leveraged output units are graduated to large scale units and there are more startups, which are not in fluency of production;
- Changed definitions also impacts the computational base by regrouping of segments;
- There are also discernible cases of output of SSI being integrated input of large industries and to avoid sales tax imposition, there is no isolation of such downstream SSIs.

Annual Average Growth Rates of various parameters in SSI pre-liberalization and post-liberalization period

**Table 4: Annual average growth for the sub periods**

	AAGRPrL*	AAGRPoL**
Units	9.637006	4.063012
Production	20.16277	12.79051
Employment	7.196365	4.236112
Production per employee	3.977058	3.721566
SSI exports	21.31401	20.09276
GDP	13.39709	12.9651
Total Exports	16.70459	18.79837

\*\* AAGRPrL stands for Annual average growth rate for the pre liberalization period

\*\*AAGRPoL stands for annual average growth rate for the post liberalization period

The reserved lists of the small scale units has been increased from 177 in 1972 to 837 in 1983 and then declined to 605 which might be a reason lesser average annual growth rate of no of unit at 4.063 % in the post-liberalization period compared to a growth rate of 9.64 % in the pre-liberalization period. The annual average growth of production, employment, production per employee and SSI exports has been at the rate of 12.79%, 4.24%, 3.72%, and 20.09% respectively, which is less than that of the pre-liberalization period indicating the fact that despite the policy measures taken by the government after 1991, there has not been much impetus for SSI sector to grow.

The decade of 1990s has been marked by considerable deregulation of industrial economy through delicensing and dereservations, 'opening up' the industrial sector to both internal and external

sector, lowering tariffs, removal of quantitative restrictions etc. These reforms have an adverse effect on the small-scale sector. This is clear from the fact the annual average growth rate of different parameters of SSIs have declined in the period of nineties vis-à-vis the pre-reform years.

**Table 5: SSI exports as a percentage of total exports, SSI production as a percentage of GDP**

Year	SSIEXPAPTE	TP%GDP
1973-74	15.85	10.97
1974-75	15.02	11.87
1975-76	12.39	13.21
1976-77	15.56	13.82
1977-78	14.79	14.08
1978-79	19.21	14.35
1979-80	18.70	17.87
1980-81	23.84	19.55
1981-82	26.90	19.34
1982-83	22.72	18.59
1983-84	22.52	18.95
1984-85	21.29	20.57
1985-86	25.70	22.02
1986-87	28.91	23.23
1987-88	28.07	24.64
1988-89	27.19	25.24
1989-90	27.48	27.21

**Table 6: SSI exports as a percentage of total exports, SSI production as a percentage of GDP**

Year	SSIEXPAPTE	TP%GDP
1990-91	29.68	13.86
1991-92	31.52	12.34
1992-93	33.12	11.28
1993-94	36.28	11.50
1994-95	35.16	12.06
1995-96	34.29	12.43
1996-97	33.03	12.26
1997-98	34.16	12.30
1998-99	35.05	12.09
1999-00	33.97	12.07
2000-01	34.29	12.51
2001-02	34.09	12.42
2002-03	33.71	12.67
2003-04	33.28	12.96

The above two tables reflecting the proportion of SSI exports as a percentage of total exports and the percentage of the value of total production in SSI sector of the GDP (at market prices) gives the conclusion that the contribution of SS&ME to total production and to the GDP which had improved in the pre-reform era from 15.8 % to 27.48% and from 10.97% to 27.21% while it has almost become stagnant after 1990-91 in terms of exports and it has deteriorated in terms of percentage of total product.

**Table 8: Unit Root Table**

Variables	ADF estimated (Level Form)	Phillips Pherron test (Level Form)
GDP	1.30* (0)	9.56*
SSEXP	2.76 * (0)	8.89*
Total Production	1.676*(0)	5.52*

Critical Values for level ADF

	Critical value	
1%		-3.66
5%	Critical Value	-2.96
10%	Critical value	-2.62

Critical values for PP Test

	Critical value	
1%		-3.65
5%	Critical Value	-2.99
10%	Critical value	-2.61

The study here employs unit root tests to examine the time series properties of concerned variable. According to the value of the test, we can accept or reject the hypothesis of random walk. For the purpose of the study the ADF test has been used, which is based on the Schwarz Information Criterion, while the Philips Person (PP) test bandwidth is based on Newey-West. Table (8) shows the results of unit roots test for level form. The results indicate that all variables chosen for the purpose of this paper are stationary.

## 7. GANGER CAUSALITY TEST

**Table-9 Ganger causality between Total production in SSI vs. GDP**

Null Hypothesis:	F-statistics	Probability	Tabulated
TP in SSI does not Ganger cause GDP	2.4865	0.1027	3.44
GDP does not Ganger cause TP in SSI	0.655	0.527	3.44

**Table -10 Ganger Causality between SSI Exports and GDP**

Null Hypothesis:	F-statistics	Probability	Tabulated
SSIEXP does not Ganger cause GDP	1.7069	0.201	3.44
GDP does not Ganger cause SSIEXP	0.4373	0.527	3.44

The purpose of this section of the analysis is to test whether exports in SSI Granger cause GDP and to test also the Granger causality between SSI output and GDP in India for the period 1973-2005. The first null hypothesis is that exports (X) SSI do not Granger cause GDP (Y). The second null hypothesis is that GDP does not Granger cause exports (X) in SSI. The third null hypothesis is that total productions in SSI do not Granger cause GDP and the fourth hypothesis is rise in GDP does not Ganger cause SSI exports .(both at the 5% level of significance). Here we have taken two lag values of all the three variables for which Ganger Causality test has been carried out.

Tables 9 and 10 indicate that we do have to accept the null hypothesis that exports in SSI do not Granger causes GDP, nor that GDP do not Granger cause exports (both at the 5% level of significance) also Total product in SSI do not Ganger causes GDP and GDP do not Ganger causes in TP as the estimated value of f-statistic is less than the tabulated value for F (2.29).It can be concluded that, in the Indian context the SSI has not been significantly contributory towards economic growth and vice versa despite various government initiatives and various programmes such as Rural Industrialization Programme (RIP), Informal Lending Scheme(ILS) , Rural Entrepreneurship Development Programme, Informal lending schemes, (MVN), Udyog Sadan, etc.

## 8. CONCLUSION

From the above study it can be found that the annual average growth rate of different parameters of SSIs have declined in the period of nineties vis-à-vis the pre-reform years. The productivity per employee and also employment in SSME has declined. There is an absence of any lead-lag causal relationship between exports and production in small-scale sector and GDP of Indian economy. The cause and effect relationship has been statistically negated. The emergence of the new sectors like information technology, services is expected to bring a lot of changes in the small scale sector. The present growth rate if can be sustained by these emerging sectors then the small and medium enterprises would be a major contributor to the growth of the Indian economy. But at present the small scale sector is not significantly contributing to the overall GDP.

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