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Did Liberal Economic Regime Contribute to the Growth Performance of the Manufacturing Sector in India?

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Did Liberal Economic Regime Contribute to the Growth Performance of the Manufacturing Sector in India?

[Summary: This paper attempts to verify whether liberal economic measures introduced in India since 1991/92 has brought any statistically significant growth difference in the growth performance of the manufacturing sector in India. It used the time series data from 1973/74 to 2007/08. Periodised it based on both the exogenously and endogenously determined breaks for cross verification of the growth results and arrived at the conclusion that the liberal economic regime failed to contribute to the growth performance of the manufacturing sector in India].

Key Words: Growth Rate, Manufacturing Sector, Liberal Economic Regime and Protected Regime.

Introduction: Most of the advanced countries across the globe have achieved rapid economic growth over the years, essentially led by industrialization.¹ On observing the sectoral contribution to the national income over the years in the US, Kuznets pointed out that a country would go through a structural transformation in terms of the relative importance of sectors. He argued that, as an economy grows, industrial sector would gain significance in the course of time replacing agriculture [Kuznets, 1972]. In Lewis model of growth, transfer of surplus labour in agriculture sector to industrial sector was recommended to ward off unemployment problems, especially faced by developing countries [Lewis, 1954]. Given its backward and forward linkages, industrial sector is able to induce growth in other sectors of the economy. Industrialization is therefore seen as an instrument of economic growth and development. In India, industrialization received a shot in the arm from the second five year plan onwards. Since then the growth experience of the economy and the industrial sector were/are closely and systematically monitored by many government agencies and academicians and formed the basis for serious policy changes over the years². The protected policy regime practiced until the 1990s and the introductions of new economic policy (NEP) announcement since 1991/92 that attempts to integrate the Indian Economy with the World Economy are evidence to cite in this respect. The growth performance

¹ Todaro [2000], Chenery [1979], Maddison [1970], Denison [1962], Kaldor [1961 and 1957], Bryce [1960], Rostow [1960], Hicks [1959] Hirschman, [1958], Myrdal [1957], Lewis [1954], Nurkse [1953], Clark [1940] and Rodan [1943].

² Industrial Policy Resolution of 1956, 1977 and 1980; The MRTP Act of 1969; The FERA of 1973; Broad banding of 1983; Extension of industrial delicensing to MRTP and FERA companies in 1985; Export-Import policy announcement of 1985 and 1988; New Economic Policy announcement of 1991/92 and its follow-up in 1995/96 are a few to cite in this context [for more details on the policy aspects see Babu, 2001; Inoue 1992 and Satyanarayana, 1996].

of the Indian Economy and the manufacturing sector during the two different policy regimes were/are, however, not free from criticisms.

The present exercise is only an attempt to understand and evaluate the growth experiences of the economy in general and manufacturing sector in particular against the reform measures implemented in the country since 1991/92. Eexercise of this nature, therefore, would necessarily invite a brief review and reflection on those policies practiced by the government prior to the 1990s, as it would form a good background/history to understand what necessitated for the implementation of the new economic reform measures and it is given in section - I. Including introduction and reviews of the policy measures, this paper is organized into four sections. In Section-II, the objectives of the paper and methodologies used are discussed. Analysis and discussions on the growth performance of the manufacturing sector are provided in Section-III. The final summary of the findings are given in Section-IV.

Section - I

Reviews of the Policy measures (1948 to 2002)

1. After the independence the first industrial policy was formulated by India in April 1948. Based on the strategic importance the 1948 policy classified the Indian industries into four major categories as (a) industries exclusively reserved for the Central Govt. (b) industries that can be undertaken only by the state (c) industries that need to be controlled and regulated by the Central Govt. and (d) industries reserved for the private sectors and individuals – so that both the government and private sectors can simultaneously indulge in the promotion/progress of industries.
2. The industrial policy regulation of 1956 classified the industries into three broad categories as Schedule A, B and C. Seventeen industries were brought under 'A' and became the responsibility of the state to look after. Schedule B had twelve industries and were made subject to the ownership of the state but the privates were also allowed to play a supplementary role. Industries not covered under schedule A and B were reserved for the private sector but kept under state regulation. These apart, the need for foreign capital, encouragement to the small scale and village industries and reduction in the regional industrial disparities were also aimed at by the 1956 industrial policy.

3. In December 1977 the Janata Government announced a set of policy measures, which insisted more on the promotion of Small-scale sector. 'District Industrial Centres' (DIC) were also set up to serve the same objective. The role of large-scale public sector units was confined to the removal of the supply bottlenecks. Any expansion activities of the existing units were made possible only after obtaining a license. Moreover this is also the period in which the 'inward looking policy' (otherwise known as the policy of import substitution) was viewed as a major growth strategy under the regulated regime until the seventies. However, it did not escape a severe criticism from the quadrangle of the pro liberal thinkers as they could easily hold responsible the 'inward looking strategy' along with the 'licensing raj' for preventing the growth and expansion of the large enterprises in many ways along with many other arguments listed below. The increase in savings and investment rates experienced over the years that was eaten away by the increased incremental capital-output ratios (ICOR) [see Albin, 2004]. The then existed administrative complexities emphasized more on the 'regulation' than the 'development' itself. Rigid labour laws coupled with excessive protections in the name of 'infant industry' arguments weakened the competitive spirit of the Indian industries unlike in the case of Taiwan, South Korea and Brazil. The experience of industrial deceleration that occurred in India from the mid-1960s through the mid-1970s only strengthened the criticism against the protected regime [Nayyar, 1994]. This compelled the government to look for 'export-led' strategy as an alternative measure and this in turn resulted in the reorientation of the industrial policy announcement of the eighties that saw a reduction in the domestic barriers to entry and expansion.
4. In addition, this is also the period marked with wide spread problem of growing current account imbalances, increasing external debt, unfavorable terms of trade, rising government budget deficits and inflation in almost all the less developing countries of the world. As pointed out earlier, India too was found wrestling almost with the same set of problems and left with rather no option but to yield to the Western Philosophy of Privatization, which began and successfully practiced in Britain during the regime of Margaret Thatcher [De Walle, 1989]. Such international climate should also be treated as yet another compelling force behind the industrial policy announcement of the Indian government in late-1980s that gave importance to regularize the existing capacity installed over and above the licensed capacity. The liberalized licensing approach was also adopted towards the large industries permitting them to expand their licensed capacity

automatically. The raising of MRTP's asset limits from Rs.20 to Rs.100 crores, the introduction of 'Broad-Banding', and periodical announcement of tax holidays ensured more flexibility to the manufacturers and helped them to adjust their product-mix. The eighties' policies, thus, seems to have provided a new dimension towards the philosophy of 'liberalization', which is, also referred as the philosophy of 'market friendliness'.

5. What began in the eighties as policy measures got intensified since July 1991 as there was no other choice but yield to the pressure of World Bank to implement privatization policies through the conditions attached to structural and sectoral adjustment loans [Christiansen, 1989]. For example, simultaneous execution of (a) a fiscal adjustment measure to stabilize the macro-economic situation on the one hand and (b) structural adjustment programme to reform the industry and trade on the other. It involved subsidy cuts in fertilizer and export front; abolition of MRTP act; linking of imports to the exports through the introduction of 'Exim- scrips' that are tradable; partial convertibility of Indian rupee on the current account; devaluation of Indian currency against the international exchange market; inclusion of more commodities under the OGL list etc., along with reduction in the interest rates and tax holidays for investments in certain industrially backward areas are a few to mention. A positive industrial growth response witnessed since the mid-1970s through the 1980s along with a renewed impetus experienced during the 1990s, at the macro level, was viewed by many as a reward to the economic reform measures introduced ever since the 1980s and 1990s in particular. Any policy announcement came after 1991 could only maintain the same direction along with a higher momentum with the promise of 'no going back'. Privatization of public sector units were also done to finance the fiscal and revenue deficits of the government [The Hindu, Oct., 2002, p.10]. Sudden withdrawal of the government from its participation in the investment activities were/are also noticed on a regular basis. This is very much apparent since the Eighth Plan period 1992-97 (see Table 1).
6. Having had a quick recollection of the background of the policy changes, enquiry on how the growth of the economy in general and manufacturing sector in particular responded to the liberalized regime since 1991/92 is indeed a matter of concern because, there are literatures with contradicting results³ and have laid a prospective base for yet another

³ For instance, study by Balakrishnan and Babu [2003] could find a faster growth of output across manufacturing since 1991 and they reject the hypothesis of growing joblessness. However studies by Nagaraj [2003 (a) and (b)] and Thamrajakshi [2003] reveals an opposite results altogether.

lively debate in same area -to which soon we would turn to in section-III but after spelling out the objectives and methodologies followed in the current exercise in section-II.

Table 1: Public Sector investment in the organized industrial sector (values in per cent).

| Plan periods | % share of Pub.Sect. in the total investment in Organised Industry and Minerals. |
|------------------------|--|
| First Plan (1951-56) | 16 |
| Second Plan (1956-61) | 47 |
| Third Plan (1961-66) | 51 |
| Fourth Plan (1969-74) | 58 |
| Fifth Plan (1974-79) | 62 |
| Sixth Plan (1980-85) | 40 |
| Seventh Plan (1985-90) | 40 |
| Eight Plan (1992-97) | 33.3 |
| Ninth Plan (1997-02) | 14.3 |

Source: Mid-Term appraisal of five year plans, Various issues.

Section - II

Objectives and Methodologies

Objectives: The overall objective of the present study is to identify whether liberalization favoured the manufacturing sector in India. In order to fulfill this overall objective we have set three specific objectives and they are listed below.

1. To verify whether economic liberalization favoured the output (GVAD) growth performance of the manufacturing sector in India.

H_0 : Liberalization did not favour the output growth performance of manufacturing sector.

H_1 : Liberalization favoured the output growth performance of manufacturing sector.

2. To recognize whether economic liberalization facilitated the growth of capital formation of manufacturing sector in India.

H_0 : Liberalization did not facilitate the growth of capital formation of manufacturing sector.

H_1 : Liberalization facilitated the growth of capital formation of manufacturing sector.

3. To examine whether economic liberalization contributed to the employment growth of manufacturing sector in India.

H_0 : Liberalization did not contribute to the employment growth of manufacturing sector.

H_1 : Liberalization contributed to the employment growth of manufacturing sector.

Methodology: In this part of the section we briefly discuss about the details of the (a) data sources, (b) period of the study, (c) issues encountered while dealing with the growth computation, (d) issues involved in the periodization of time series data and (e) limitations of the study.

(a) Data Source: We have used the secondary data sources from the (i) *Annual Survey of Industry* (ASI) published by the Central Statistical Office (CSO, formerly Central Statistical Organization) and Economic and Political Weekly Research Foundation (EPWRF) as well⁴; (ii) *Handbook of Statistics on Indian Economy*, the annual publication of Reserve Bank of India (RBI) and (iii) *National Accounts Statistics* (NAS) published by CSO.

(b) Period of the Study: Thirty Five Years (1973/74 to 2007/08). *ASI Factory Sector Summary Result* provides time series data un-interruptedly only from 1973/74. Latest year for which data provided by the ASI is 2007/08. The period of analysis for the current exercise is thus conditioned by the availability of data.

(c) Issues encountered while dealing with growth computation: Of the many, few important issues faced while computing the growth rate are mentioned below.

- (i) How and on what basis the time series is to be periodized?
- (ii) Choosing the method to compute growth rate
- (iii) Variables to be chosen for the growth analysis

Issues from (i) to (iii) have been addressed as under.

(i) Issues on Periodization or Break Date of the Time Series: Answer to the sub-point **(d)** mentioned in the methodology above is also effectively addressed here. Generally periodization or break date is done either based on some known feature of the data such as an observed inflexion in the graph of a series or based on the occurrence of some exogenous events⁵ expected to bring some important changes into the industry or economy [Balakrishnan and Parameswaran, 2007]. This is referred to as a priori method with theoretical backing. However, through Chow

⁴ The CSO publishes factory related data in its annual publication known as *Annual Survey of Industries: Factory Sector Summary Result*. The Economic and Political Weekly Research Foundation (EPWRF) also published the same in soft copies but only up to the year 2003/04. For some cross references we have made use of it too. The ASI covered factories employing 10 and more workers with power and those employing 20 and more workers without power. Though ASI provides a continuous time-series data from 1959 onwards, it had a break in the year 1972/73 as there was no survey conducted for that year.

⁵ Exogenous events or factors are of many types – the economic policy announcements, war, famine and oil shocks are a few to cite as examples. While adopting the a priori method, we applied both the observed inflexion and exogenous factors equally to periodize the time series data. We verified the same with the help of the endogenous break test for its statistical approval and comparison.

Test the statistical validity of the break imposed in the time series can be verified. Alternative to this a priori method is the application of statistical tools to determine the structural breaks endogenously and periodize the time series accordingly. It is rare to come across studies adopting both the methods systematically for periodizing the time series data. The present study, however, makes one such attempt adopting both the methods to periodize its time series data.

Chow Test: In studies, particularly using time series data, the Chow Test is normally applied to find if estimates of two different period of time is statistically different [Balakrishnan and Parameswaran, 2007].

$$\text{The functional form of the Chow Test is } F = \frac{(ESS_{UR} - (ESS_1 + ESS_2)) / K}{(ESS_1 + ESS_2) / T - 2K}$$

where,

ESS_{UR} = is the error sum of squares of the unrestricted years (that is, the full period)

ESS_1 = is the error sum of squares of the sub-period one

ESS_2 = is the error sum of squares of the sub-period two

K = is the number of barometers to be estimated (eg. time & gvad of the industry in concern)

T = is the number of observation (that is, no. of time points).

F = is the F statistic.

All the required regression results were obtained by using the statistical software package ‘Stata Ic10’, to get the ESS values. These values are to be applied in the above formula and if the outcomes are statistically significant, our periodization/break would also stand the test of statistical validity. Similarly, compared to the growth results achieved under the protected regime of 1973/74 to 1990/91, if the growth results obtained during the liberal period of 1991/92 to 2007/08 is confirmed by the Chow Test as significant – we can then safely contend that the growth rate achieved during the liberal regime is significantly different from that of the protected regime. Extending the logic further, we may therefore attribute the growth achieved during the liberal period as the impact/result of economic liberalization. As these practices are accepted as more scientific, we too allowed the time series data of our study to pass through the Chow Test for its statistical validity.

Bai and Perron’s Structural Break Test: As already mentioned earlier, alternative to exogenously determined break/periodization is the application of statistical tools to determine the structural breaks endogenously and periodize the time series as dictated purely by statistical tools and not informed by theory. This is popularly known as **Bai and Perron’s** Structural Break Test (henceforth SBT) [Bai and

Perron 1998 & 2003]⁶. It is basically: “...an approach to the problem of identifying breaks in a series based on the least squares principle common to regression analysis. Its superiority draws from the feature that it allows for the simultaneous estimation of multiple breaks” [Balakrishnan and Parameswaran, 2007, p.2916].

To statistically authenticate and cross-examine our exogenously determined periodization/break, we subjected our time series data to pass through the test of Bai and Perron’s Structural Break Test (SBT) also.

For the given time series data from 1973/74 to 2007/08, four significant break points were reported by the Bai and Perron’s Structural Break Test. They are 1979/80, 1986/87, 1993/94 and 2000/01. Examining the impact of economic liberalization on the manufacturing sector is being the prime concern of our study; only the breaks that occurred after the liberal policy announcements in 1991/92 becomes relevant to us. It is for this very specific reason we overlook the breaks obtained at 1979/80 and 1986/87 as they had occurred much ahead of the start of the liberal regime in India. Hence, while dealing with the endogenous breaks, we treat the endogenous break at 1993/94 as the first break point; and 2000/01 as the second break point. The full results of the Bai and Perron test are given in Appendix - I.

(ii) Issue on the choice of the method to compute the growth rate: Given the various options, we have opted for the annual exponential growth rate to appraise the growth performance of the manufacturing sector. The reason to opt for the annual exponential growth rate lie in the natural behaviour of the time series data of the manufacturing sector and the macroeconomic variables of GDP and GDCF. Verification of this is possible from Figure 1, Figure 2, Figure 3, Figure 4 and Figure 5. Hence we confine ourselves to the use of the exponential function for computing the growth rate.

⁶ Nevertheless confusions still prevails in making the choice between the two available methods of exogenous and endogenous break test. A better clarification on this matter is expected to prevail when I quote what Mukherjee had already said on it. “...over the past two decades or so, there has been a substantial growth of literature on the methodology of determining structural breaks endogenously (See Bai [1997], Bai and Perron [2003], Altissimo and Corradi [2003], among many others.). ... As a result, for a practitioner, there is the dilemma of choosing between pre-specified breakpoint(s) which can vary from one researcher to another, and the endogenously determined break point(s) which can vary from one test to another.” Mukherjee [2009, p.13].

The exponential function used to calculate the annual growth rate is

$$\ln Y_t = \alpha_0 + \beta t + u$$

where, $\ln Y_t$ is the log of the dependent variable chosen.

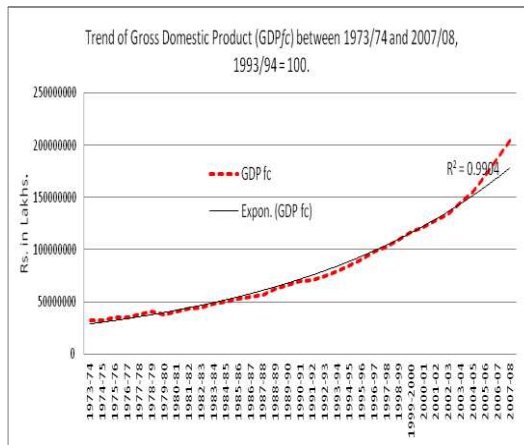
α_0 is the intercept.

' β ' is the coefficient

' t ' is the time and

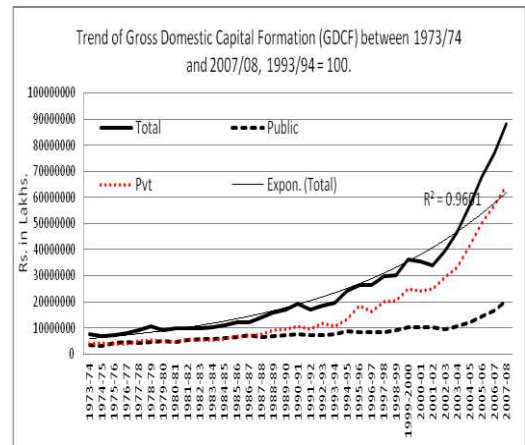
' u ' is the error term.

Figure: 1



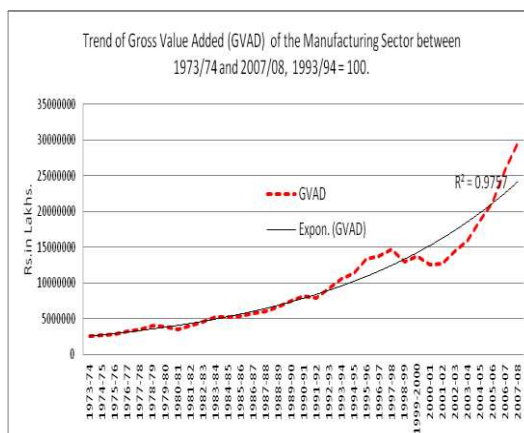
Source: National Accounts Statistics – Various Issues.

Figure: 2



Source: National Accounts Statistics – Various Issues.

Figure: 3



Source: Source: Annual Survey of Industries (ASI), Factory Sector Summary Results – Various Issues.

Figure: 4

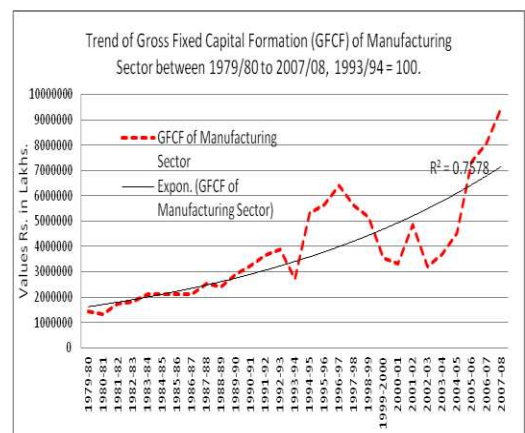


Figure: 5



Source: Source: Annual Survey of Industries (ASI), Factory Sector Summary Results – Various Issues.

(iii) Variables chosen for the growth analysis: As we intend to evaluate the performance of manufacturing sector during the two different policy regimes (*that is*, protected and liberal regimes) primarily we rely upon the output variable of gross value added (henceforth GVAD) as the growth performance of an industry is judged and addressed better by their output (GVAD). It is through this variable we address the first objective. In addition to this, we have also selectively made use of other variables such as: gross fixed capital formation (henceforth GFCF) – to explain and represent the capital expenditure – *that is*, the investment aspects. Though this variable the second objective of the study is fulfilled; and number of employees – to represent the employment scenario in manufacturing sector and it also helps us to address the third objective of the current exercise. In addition, the study also made use of the macroeconomic variables such as GDP, GDCF as this would provide a better understanding of the overall behaviour of the Indian Economic during the liberal regime in which the manufacturing sector is a sub set.

(e) Limitation of the Study: Limitation of the current study is mainly related to the data. Main data sources are the *Annual Survey of Industry (ASI)* and *National Accounts Statistics (NAS)* published by the Central Statistical Office (CSO). The ASI data provides information only for the registered manufacturing sectors leaving out the entire unorganized sector. It provides data based on the sample it collects and does not cover the entire population of the organized sector.

Having discussed the objectives and methodology of the study we move on to examine how the growth of the economy in general and manufacturing sector in particular responded to the liberalized regime since 1991/92 in section III.

Section – III

Growth Experience - an Evaluation

As economic growth is a precondition for realizing the ‘trickle down’ effect, countries were/are making all possible attempts to attain better economic growth rate (*that is*, better GDP growth rate) in which, among other things, industries are expected to play a vital role [Kuznets, 1972 and Lewis, 1954]. India remained no exception to it since independence. However, the common complaint was that Indian Economy was growing at low rate (*‘Hindu-growth rate’*⁷) until the inception of reform measures in the early 1990s. It can also be verified from Table 1 and Table 2 as the GDP in India was growing at the rate of 4.5 per cent per annum as per the exogenous break; and 4.6 per cent per annum as per the endogenous break. The capital expenditure of the economy (*that is*, GDCF) during the protected regime was growing at the rate of 5.3 per cent – of which the capital expenditure of the private sector was growing greater than the public sector (see Table 1). As per the endogenous break also the trend remained the same for both the macroeconomic variables of GDP and GDCF when the growth rate was calculated (see Table 2).

With the advent of economic liberalization in the year 1991/92, the rate of growth of Indian Economy, in terms of its GDP, got out of its derogatory description of the ‘Hindu-rate of growth’ as it became more than 6 per cent per annum both in terms of exogenous and endogenous breaks. It can be attributed to the increased rate of growth of capital expenditure of the economy as it became more than 9 per cent per annum during the liberal regime. Once again the private sector capital expenditure remained greater than the public sector throughout the liberal regime. Also it is noticed that the investment expenditure of the private sector was growing double the rate at which the public sector was growing during the liberal period and it is true for both the breaks of

⁷ The ‘Hindu rate of growth’ or ‘Ind-growth rate’ is a derogatory description of the low annual growth rate of the pre-1991 Indian economy, which stagnated around 3.5% and 4.5% from 1950s to 1980s. ‘South Asia Investor Review’ at <http://southasiainvestor.blogspot.com/2011/09/india-back-to-hindu-growth-rate-in-2012.html> accessed on 05/12/2011.

exogenous and endogenous (see Table 1 and Table 2). This is a clear evidence to show that the government wanted the private sector to lead the growth process during the liberal regime⁸.

Table 1: Annual exponential growth rate of GDP and GDCF
(as per the **exogenously** determined break, 1993/94=100).

| Period | GDP _{fc} | GDCF | GDCF | |
|--|--|--|---|---|
| | | | Public | Private |
| 1973-74 to 1990-91 <i>The Protected Regime</i> | 4.5*** R ² = 0.983 t = 30.77 | 5.3*** R ² = 0.910 t = 12.73 | 4.6*** R ² = 0.921 t = 13.69 | 5.5*** R ² = 0.890 t = 11.40 |
| 1991-92 to 2007-08 <i>Liberal Phase</i> | 6.3*** R ² = 0.994 t = 48.029 | 9.6*** R ² = 0.958 t = 18.544 | 5.3*** R ² = 0.838 t = 8.802 | 11.3*** R ² = 0.970 t = 21.899 |
| 2000-01 to 2007-08 <i>The high growth phase</i> | 7.6*** R ² = 0.988 t = 21.88 | 14.6*** R ² = 0.971 t = 14.06 | 10.5*** R ² = 0.867 t = 6.25 | 15.2*** R ² = 0.984 t = 18.97 |

Source: For GDP and GDCF, *National Accounts Statistics* – various issues.

Note: ***, ** and * indicates level of significance at 1% , 5% and 10 % respectively.

Table 2: Annual exponential growth rate of GDP and GDCF
(as per the **endogenously** determined break, 1993/94=100).

| Period | GDP _{fc} | GDCF | GDCF | |
|--|---|--|---|--|
| | | | Public | Private |
| 1973-74 to 1992-93 <i>The Protected Regime</i> | 4.6*** R ² = 0.987 t = 38.14 | 5.2*** R ² = 0.930 t = 15.53 | 4.2*** R ² = 0.909 t = 13.46 | 5.7*** R ² = 0.916 t = 14.01 |
| 1993-94 to 2007-08 <i>Liberal Phase</i> | 6.4*** R ² = 0.991 t = 37.84 | 9.7*** R ² = 0.943 t = 14.60 | 5.7*** R ² = 0.815 t = 7.58 | 11.5*** R ² = 0.961 t = 17.78 |
| 2000-01 to 2007-08 <i>The high growth phase</i> | 7.6*** R ² = 0.988 t = 21.88 | 14.6*** R ² = 0.971 t = 14.06 | 10.5*** R ² = 0.867 t = 6.25 | 15.2*** R ² = 0.984 t = 18.97 |

Source: For GDP and GDCF, *National Accounts Statistics* – various issues.

Note: ***, ** and * indicates level of significance at 1% , 5% and 10 % respectively.

⁸ The linkage and multiplier effects of capital expenditure of government has more positive impacts than the private capital expenditure as the former is more of Social Overhead Capital (SOC) in nature while the latter is often Directly Productive Activity (DPA) in nature. The unique feature of SOC is that it creates more economies than what it appropriates while the DPA appropriates more economies than what it creates [Hirschman, 1958]. To this extend considering private capital expenditure as a greater substitute to public capital expenditure needs to be viewed with due reservation.

The growth results obtained for the macro economic variables of GDP and GDCF as per the exogenous break when subjected for the Chow Test; it is confirmed as statistically significant (see Table A1 in appendix 2). Hence, we are able to confirm that liberalization measures in India have contributed to the increased growth of the investment (GDCF) and GDP. However we are skeptical about whether this increased rate of growth of GDP has simultaneously guaranteed economic development also in the economy as studies have reported that the employment growth in the organized sector were at the declining on the one hand; and the poverty in India was also at the increase on the other hand [Nagaraj, 2003 (a) and (b) and Thamrajakshi, 2003].

However, contrary to the macroeconomic indicators, we could not able to confirm a similar better growth prospects for the manufacturing sector in India during the liberal regime for the following reasons.

1. Compared to the protected regime, the manufacturing sector registered a lower rate of growth during the liberal economic regime in terms of the output variable GVAD. Irrespective of the different method of breaks (exogenous or endogenous) followed the overall growth trend remained the same (see Table 3 and Table 4). In other words, it was during the protected regime, the growth performance of manufacturing sector, in terms of its GVAD, remained better.

The Chow Test conducted to verify for the statistical significance of the break did not confirms the growth registered during the liberal economic regime as statistically significant (See Table A 2. Hence we accept the null hypothesis of the first objective of the study and say that liberalization did not favour the growth performance of manufacturing sector.

2. Compared to the protected regime, growth performance of the manufacturing sector during the economic liberalization period, in terms of its GFCF, also remained poor for both the breaks (see Table 3 and Table 4). In fact, as per the endogenous break it registered no growth (Table 4). The Chow Test also failed to confirm the growth registered as per the exogenous break (see Table A 2). The study therefore accepts the null hypothesis of the second objective and confirms that liberalization did not facilitate the growth of GFCF (*that is*, the investment) of manufacturing sector.

Table 3: Annual exponential growth rate of Manufacturing sector in terms of GVAD, GFCF and Employment (as per the **exogenously** determined break, GVAD and GFCF are in constant prices of 1993/94=100, Employment is in numbers).

| Period | Manufacturing | | |
|--|---|--|---------------------------------------|
| | GVAD | GFCF | No.of Employees |
| 1973-74 to 1990-91 <i>The Protected Regime</i> | 6.5*** $R^2 = 0.974$ $t = 24.49$ | 6.9*** $R^2 = 0.919$ $t = 10.62$ | 1.6*** $R^2 = 0.704$ $t = 6.16$ |
| 1991-92 to 2007-08 <i>Liberal Phase</i> | 6.1*** $R^2 = 0.826$ $t = 8.448$ | 3.3* $R^2 = 0.221$ $t = 2.07$ | 0.2 $R^2 = 0.015$ $t = 0.48$ |
| 2000-01 to 2007-08 <i>The high growth phase</i> | 12.8*** $R^2 = 0.974$ $t = 14.96$ | 14.9*** $R^2 = 0.753$ $t = 4.27$ | 4.5*** $R^2 = 0.819$ $t = 5.21$ |

Source: Annual Survey of Industries (ASI), *Factory Sector Summary Results* – various issues.

Note: ***, ** and * indicates level of significance at 1%, 5% and 10 % respectively.

Table 4: Annual exponential growth rate of Manufacturing sector in terms of GVAD, GFCF and Employment (as per the **endogenously** determined break, GVAD and GFCF are in constant prices of 1993/94=100, Employment is in numbers).

| Period | Manufacturing | | |
|--|---|--|---------------------------------------|
| | GVAD | GFCF | No.of Employees |
| 1973-74 to 1992-93 <i>The Protected Regime</i> | 6.5*** $R^2 = 0.979$ $t = 29.47$ | 7.5*** $R^2 = 0.946$ $t = 14.50$ | 1.5*** $R^2 = 0.749$ $t = 7.33$ |
| 1993-94 to 2007-08 <i>Liberal Phase</i> | 5.7*** $R^2 = 0.752$ $t = 6.28$ | 3.3 $R^2 = 0.166$ $t = 1.61$ | 0.07 $R^2 = 0.0009$ $t = 0.11$ |
| 2000-01 to 2007-08 <i>The high growth phase</i> | 12.8*** $R^2 = 0.974$ $t = 14.96$ | 15.0*** $R^2 = 0.753$ $t = 4.27$ | 4.5*** $R^2 = 0.819$ $t = 5.21$ |

Source: Annual Survey of Industries (ASI), *Factory Sector Summary Results* – various issues.

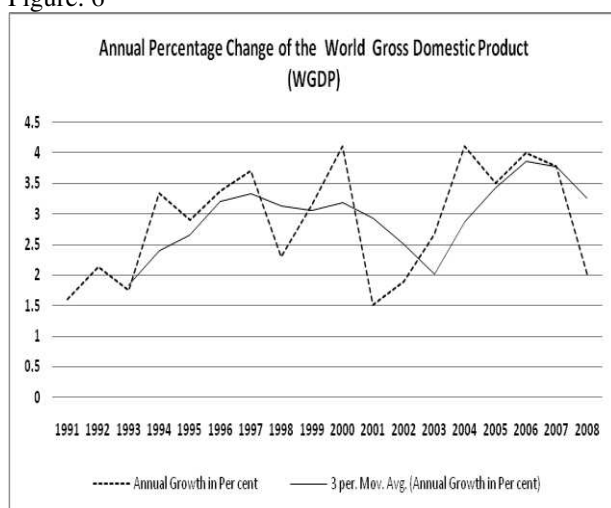
Note: ***, ** and * indicates level of significance at 1%, 5% and 10 % respectively.

- In the case of employment, both in terms of exogenous and endogenous breaks, no growth is reported for the liberal regime (see Table 3 and table 4). The Chow Test also confirms the no growth status obtained according to the exogenous break. Hence, once again we accept the null hypothesis of the third objective and conclude that liberalization failed to

contribute to the employment growth of manufacturing sector. It also reflects the ‘job-less’ nature of growth of the Indian Economy in general.

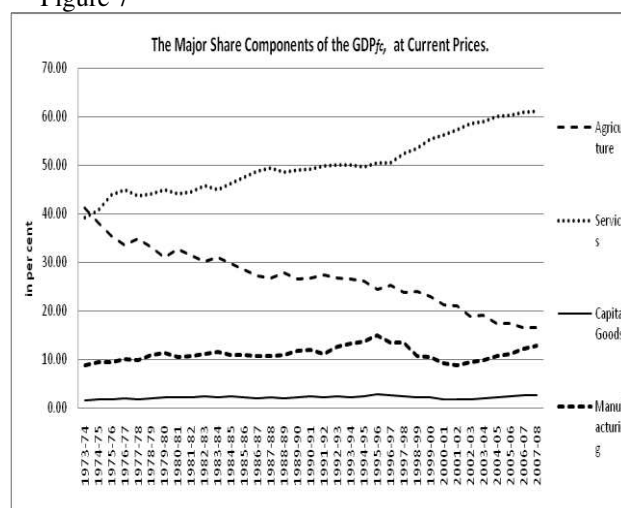
However, within the liberal economic regime, the period after 2000/01 marks a high growth phase for all the variables chosen by the study (see Figures 1 to 5) irrespective of the different break methods applied (see Table 1 to 4). Chow Test also confirms the growth rates obtained during 2000/01 to 2007/08 as statistically significant (see Table A1 and A2). Given the increasing degree of integration of Indian Economy with the rest of the World⁹, we link the high growth phase experienced at home, between 2000/01 and 2007/08, to the general economic growth buoyancy of the World¹⁰ (see Figure 6). Another important aspect we noticed in the study is that the GDP in India is appearing to be independent of the manufacturing sector. In fact, since the mid 1990s, growth of GDP is almost dictated by the service sector as it could be well recognised from Figure 7.

Figure: 6



Source: World Development Indicators, World Bank (2009).

Figure 7



Source: Handbook of Statistics, Reserve Bank of India, various issues; and ASI Factory Sector Summary Results – Various Issues.

⁹ See Albin [2010] for more details on the degree of integration of Indian Economy with the World Economy.

¹⁰ By and large, between 1991 and 2008, the world economy was growing at the rate of 2.879 per cent per annum and the same was 2.9317 per cent per annum during 2001 to 2008 (see, figure 6).

Section - IV

Summary of the Findings

The present study has examined whether economic liberalization introduced in India, since 1991/92, favoured the growth performance of the manufacturing sector. In doing so, we have placed the current study against the background of the analysis on the growth performance of the Indian Economy in terms of its macroeconomic variables of GDP and GFCF. It is learnt that the economy was growing better during the liberal economic regime than its previous protected regime. It also marked the lead role of the private capital in the growth process of the country since the inception of liberalization measures in India. Thus the high rate of growth of GDP, GDCF and the private capital investment during the liberal regime is also significantly different from that of the protected regime. Nevertheless, compared to the protected regime, liberalization measures have not brought statistically significant growth difference in the performance of the manufacturing sector. The endogenous break method adopted to cross-examine the growth results obtained by means of the exogenous break method also did not report any contradicting results.

The study therefore concludes that the introduction of liberal economic measures since 1991/92 did not favour the growth performance of the manufacturing sector in terms of its GVAD, GFCF and employment. In fact it only revealed the 'job-less' growth syndrome of the Indian Economy during the liberal economic regime.

APPENDIX 1

RESULTS OF THE BAI AND PERRON'S STRUCTURAL BREAK TEST (SBT)

The Bai and Perron's SBT is performed to identify the endogenous break points. In our case it serves double purpose in such a way that apart from finding the endogenous break periods, it primarily helps us to verify the correctness of the periodization followed in the present study.

The Bai and Perron test is conducted with the aid of the statistical software package called 'R', version 'R2.12.2' and the output results are reported below as it is generated by the 'R'.

I Manufacturing Sector (GVAD of the Actual series for the period 1973/74 to 2007/08).

Confidence intervals for breakpoints
of optimal 5-segment partition:

Call:

confint.breakpointsfull(object = bp, breaks = 4)

Breakpoints at observation number:

2.5 % breakpoints 97.5 %

| | | | |
|---|----|----|----|
| 1 | 5 | 7 | 9 |
| 2 | 12 | 14 | 16 |
| 3 | 20 | 21 | 23 |
| 4 | 20 | 28 | 29 |

Corresponding to breakdates:

2.5 % breakpoints 97.5 %

| | | | |
|---|----|----|----|
| 1 | 5 | 7 | 9 |
| 2 | 12 | 14 | 16 |
| 3 | 20 | 21 | 23 |
| 4 | 20 | 28 | 29 |

>

[Note: for this endogenously obtained break points at 7, 14, 21 & 28th observations, the corresponding years are 1979-80, 1986-87, 1993-94 and 2000-01]

II GDP_{fc} (Actual series for the period 1973/74 to 2007/08)

Confidence intervals for breakpoints
of optimal 5-segment partition:

Call:

confint.breakpointsfull(object = bp, breaks = 4)

Breakpoints at observation number:

2.5 % breakpoints 97.5 %

| | | | |
|---|----|----|----|
| 1 | 5 | 7 | 8 |
| 2 | 13 | 14 | 15 |
| 3 | 20 | 21 | 22 |
| 4 | 26 | 28 | 29 |

Corresponding to breakdates:

2.5 % breakpoints 97.5 %

| | | | |
|---|----|----|----|
| 1 | 5 | 7 | 8 |
| 2 | 13 | 14 | 15 |
| 3 | 20 | 21 | 22 |
| 4 | 26 | 28 | 29 |

>

[Note: for this endogenously obtained break points at 7, 14, 21 & 28th observations, the corresponding years are 1979-80, 1986-87, 1993-94 and 2000-01]

III GDCF (Actual series for the period 1973/74 to 2007/08)

Confidence intervals for breakpoints
of optimal 5-segment partition:

Call:

confint.breakpointsfull(object = bp, breaks = 4)

Breakpoints at observation number:

2.5 % breakpoints 97.5 %

| | | | |
|---|----|----|----|
| 1 | 5 | 7 | 11 |
| 2 | 13 | 14 | 15 |
| 3 | 20 | 21 | 22 |
| 4 | 24 | 28 | 29 |

Corresponding to breakdates:

2.5 % breakpoints 97.5 %

| | | | |
|---|----|----|----|
| 1 | 5 | 7 | 11 |
| 2 | 13 | 14 | 15 |
| 3 | 20 | 21 | 22 |
| 4 | 24 | 28 | 29 |

[Note: for this endogenously obtained break points at 7, 14, 21 & 28th observations, the corresponding years are 1979-80, 1986-87, 1993-94 and 2000-01]

APPENDIX 2

Table A 1: Chow Test Results for the macroeconomic variables of GDP and GDCF.

| Exogenous Breaks | ESS_R | ESS_I | ESS_2 | F value | P value |
|---|------------|------------|------------|------------|-----------|
| Gross Domestic Product at factor cost (GDP) | | | | | |
| 1973-74 to 90-91 vs 1991-92 to 2007-08 | 0.99837271 | 0.01684522 | 0.01067319 | 546.842476 | 0.000000 |
| 1991-92 to 99-00 vs 2000-01to 2007-08 | 0.01067319 | 0.00051202 | 0.00301269 | 13.1826322 | 0.000750 |
| Aggregate Gross Domestic Capital Formation (GDCF) | | | | | |
| 1973-74 to 90-91 vs 1991-92 to 2007-08 | 0.71219510 | 0.13337796 | 0.16262391 | 21.7937634 | 0.000000 |
| 1991-92 to 99-00 vs 2000-01to 2007-08 | 0.16262391 | 0.01839621 | 0.02699494 | 16.7876947 | 0.000250 |
| Public Gross Domestic Capital Formation (<i>that is, Government Capital Expenditure</i>) | | | | | |
| 1973-74 to 90-91 vs 1991-92 to 2007-08 | 0.4226417 | 0.0855026 | 0.2232473 | 5.7176459 | 0.0077000 |
| 1991-92 to 99-00 vs 2000-01to 2007-08 | 0.2232473 | 0.0220059 | 0.0704841 | 9.1893426 | 0.0032500 |
| Private Gross Domestic Capital Formation (<i>that is, Private Capital Expenditure</i>) | | | | | |
| 1973-74 to 90-91 vs 1991-92 to 2007-08 | 1.0782403 | 0.1800958 | 0.1617509 | 33.3895344 | 0.0000000 |
| 1991-92 to 99-00 vs 2000-01to 2007-08 | 0.1617509 | 0.0683961 | 0.0162202 | 5.9252810 | 0.0148200 |

Table A 2: Chow Test Results for the Manufacturing Sector (GVAD, GFCF and Number of Employees).

| Manufacturing Sector | | | | | |
|---|------------|------------|------------|------------|-----------|
| Exogenous Breaks | ESS_R | ESS_I | ESS_2 | F value | P value |
| Gross Value Added (GVAD) | | | | | |
| 1973-74 to 90-91 vs 1991-92 to 2007-08 | 0.38815583 | 0.05466878 | 0.32003146 | 0.55660952 | 0.578770 |
| 1991-92 to 99-00 vs 2000-01to 2007-08 | 0.32003146 | 0.07307150 | 0.01857839 | 16.1972911 | 0.000300 |
| Gross Fixed Capital Formation (GFCF) | | | | | |
| 1973-74 to 90-91 vs 1991-92 to 2007-08 | 1.826099 | 0.060952 | 1.534033 | 1.811260 | 0.184250 |
| 1991-92 to 99-00 vs 2000-01to 2007-08 | 1.534033 | 0.552464 | 0.309669 | 5.065744 | 0.023620 |
| Number of Employees | | | | | |
| 1973-74 to 90-91 vs 1991-92 to 2007-08 | 0.2463979 | 0.0516922 | 0.1537978 | 3.0856517 | 0.0599600 |
| 1991-92 to 99-00 vs 2000-01to 2007-08 | 0.1537978 | 0.0454657 | 0.0190360 | 8.9985925 | 0.0035200 |

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