Resurgent India: An Economic Perspective

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Abstract:

Resurgent India is a multi – dimensional concept. Economic interpretation is just one aspect of its multi – dimensionality. This paper seeks to analyze the concept of resurgence in the context of India's economic growth and try to understand the source thereof.

Key Words: *Resurgent India, TFP, FDI, Human Resource Development Policies*

I. Introduction

Oxford dictionary defines resurgence as, 'an increase or revival after a period of little activity, popularity, or occurrence'. With this definition in mind it would be interesting to revisit the concept of 'Resurgent India'. Can we truly call Indian economic growth as resurgent? Do we have any analytical tool to quantitatively measure resurgence? If yes, it would be interesting to try and decipher the source of resurgenceon economic front. Such a study will not only help us in understanding the under currents of economic growth but will also be of great help in analyzing the current economic policy in right perspective.

The analytical tool in question is 'Total Factor Productivity (TFP)[1]'.Total Factor Productivity accounts for those aspects of economic growth which remains unexplained by the traditional factors of production namely, labor and capital.

The objective of this paper is twofold, firstly it highlights the importance of 'Total Factor Productivity (TFP)' in explaining economic growth in recent past, and secondly, the paper tries to emphasize the significance of Human capital development policies as a prelude to economic growth.

The basic idea is to calculate TFP for Pre – reform and post – reform period and the differences thereof. If the difference in TFP is positive and significant enough, we will be in a better position to support the resurgent India claim with a given level of confidence.

This paper comprises of four sections. Section two explainsthe methodology adopted to measure Total Factor Productivity.Making use of the technique developed for measuring TFP, the next section calculates an empirical estimation of TFP for pre and post reform periods, for the Indian economy.If the difference between pre and post reform TFP turns out to be significant enough, we will use it to emphasize the significance of Human capital

[1]Barro, R. J. (1999). Journal of Economic Growth

development policies, apart from FDI and other investment policies, as a prelude to India's economic growth. Final section contains the concluding remark and suggestions.

II. Methodology:

Traditionally, production function is used to study the sources of growth. Output grows through increases in inputs and through increases in productivity due to improved technology and a more able workforce[2]. Taking labor (N) and capital (K) as the only important inputs, a typical production function looks likethe one depicted in equation (I):

$$Y = Af(K, N) \qquad \text{(I)}$$

Where 'A' represent the level of technology, the higher the 'A' is, the more output is produced for a given level of inputs. Therefore, 'A' is also called as "productivity". A slight manipulation of equation (I) will lead us to the following equation (II):

$$\Delta Y/Y = [(1-\alpha)\,\Delta N/N] + [(\alpha)\,\Delta K/K] + \Delta A/A \qquad \text{(II)}$$

Where, (1-α) and α are weights equal to labor's share and capital's share to the output (Y). $\Delta A/A$factors for the rate of improvement in the technology, called *technical progress*, or the growth of Total Factor Productivity.

TFP cannot be measured directly; instead we will make use of 'Solow Residual[3]'. The technical progress$\Delta A/A$ is measured by turning equation (II) inside out.

$$\Delta A/A = \Delta Y/Y - [(1-\alpha)\,\Delta N/N] - [(\alpha)\,\Delta K/K] \qquad \text{(III)}$$

Measured this way changes in TFP i.e., $\Delta A/A$ is called,'Solow Residual'.

III. Empirical Estimation:

The growth rate of capital stock series for 1975 to 2012 is constructed using data available for capital formation at constant 2004 – 05 price series. Whereas the labor force growth rate series for 1975 to 2012 were constructed using employment data for organized sector of both private and public sector. Capital share value (α) is derived from Brahamanand (1982), who estimated the share of wages in totalincome for the economy as 75% from 1950 to 1970 and 71% for 1980. This suggests acapital share of 25% in the fifties and sixties,

[2] Ibid
[3] Solow, R. (1957). Review of Economic and Statistics

rising to 29%between 1970 and 1980 andperhaps even higher in the nineties. As per one research, "TheTFP estimates are not sensitive to different fixed weights for capital and labor. There may be minor differences among the estimates but they do not change their nature significantly[4]". Our estimate of 0.25for capital share and 0.75 for labor share (1-α) therefore appears quite reasonable and justified[5].

Pre – Reform Period (1976 to 1991)

Indian economy underwent monumental and qualitative changes in the year 1991[6]. A series of reforms and structural adjustments were undertaken in almost every aspects of the economy. To verify the claim of resurgent India, mainly in economic aspect, it would be appropriate, therefore, to consider 1991 as the year of divide. TFP calculations for the pre – reform period areas depicted in figure1, and that of the post – reform period is depicted in figure2. The actual data series used for TFP calculation purpose is given in table1 below.

The TPF for the pre – reform period was highly fluctuating, varying from the low of (-) 5.149280475 percent in the year 1976 – 77 to reaching as high as 5.761910508 percent in 1988 – 89 and again touching (-) 0.010657876 for the year 1990 – 91, a year prior to the reforms. On an average TFP growth rate for the pre – reform period remained around 1.278792968 percent.

Figure1: Total Factor Productivity Graph for Pre – Reform Period (1976 to 1991)[7]

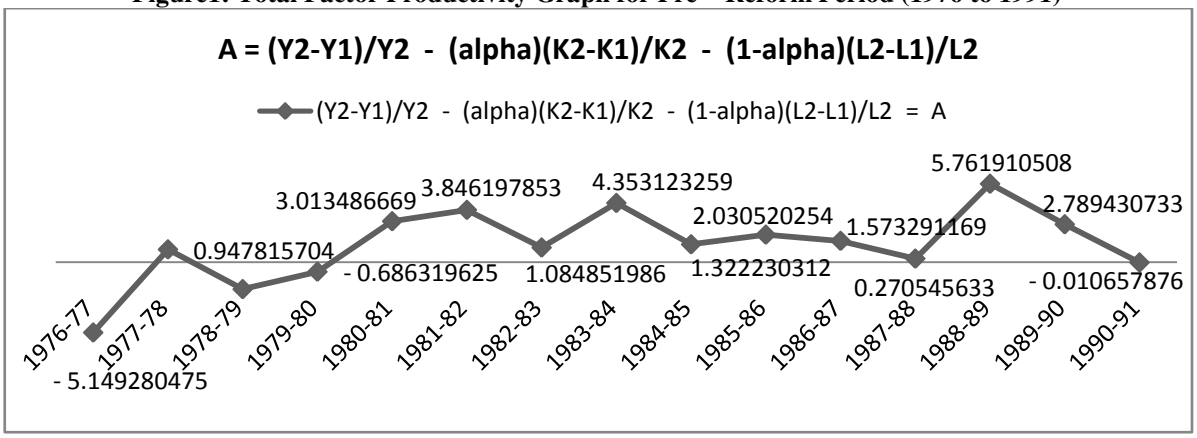

Figure1 brings out the near zero value of TFP curve which means that during the pre – reform period the major source of GDP growth were the real factor inputs and the contribution of technical progress or TFP was minimal if not insignificant.

[4]Saha, S. (2014). The NEHU Journal, Vol XII, No. 1, 95-106.
[5]Brahmananda, P. R.(1982). Himalaya Publishing House
[6] New Economic Policy, 1991
[7]Central Statistical Organization, MOSPI, GOI, "New Series of National Accounts Statistics (Base Year 2004-05)"

Post – Reform Period (1992 to 2012)

Regression Analysis[8]: $Y_{Growth1}$ *versus* $L_{Growth1}$, $C_{Growth1}$

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	2	18.361	9.180	5.59	0.014
$L_{Growth1}$	1	10.388	10.388	6.33	0.022
$C_{Growth1}$	1	9.275	9.275	5.65	0.029
Error	17	27.901	1.641		
Total	19	46.262			

Model Summary

S	R-sq	R-sq(adj)
1.28111	39.69%	32.59%

Coefficients

Term	Coef	SE Coef	t-Value	P-Value[9]
Constant	5.398	0.470	11.50	0.000
$L_{Growth1}$	0.777	0.309	2.52	0.022
$C_{Growth1}$	0.373	0.157	2.38	0.029

Regression Equation:

$$Y_{Growt\,h_1} = 5.398 + 0.777L_{Growt\,h_1} + 0.373C_{Growt\,h_1} \quad \text{(V)}$$

During the post – reform period the contribution of labor force and capital in explaining out GDP growth rate were 0.777 and 0.373 respectively. This means a one point increase in labor force and capital formation leads to 0.777 and 0.373 point increase in GDP growth rate respectively. Given the GDP growth rate and the contribution of real factors to GDP growth, the unexplained component is far greater during the post reform period.

The average TFP during pre – reform period is just around 1.278792968 which is far below the average TFP for the post – reform period, which is around 3.927399556, an increase of almost four fold. TFP curve as depicted in figure2 is far above the x-axis as compared to the one depicted in figure1 above.

[8]Minitab® 17.1.0

[9]The smaller the p-value, the smaller the probability that rejecting the null hypothesis is a mistake

Figure2: Total Factor Productivity Graph for Post – Reform Period (1992 to 2012)[10]

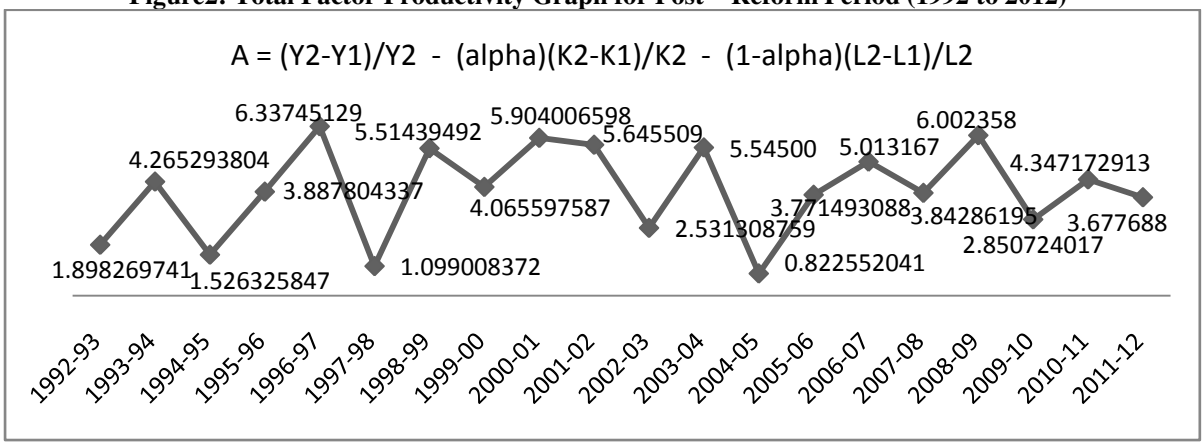

Table1: Calculations of TFP for pre and post reform period[11]

Year	GDP	GDCF	Employment	$(Y_2-Y_1)/Y_2$	$(1-\propto)(L_2-L_1)/L_2$	$(\propto)(K_2-K_1)/K_2$	TFP
1975-76	6846.34	1209.45	204.2	8.260618082	1.836434868	-2.79879284	9.222976054
1976-77	6931.91	1430.53	211.3	1.234436108	2.520113583	3.863603	-5.149280475
1977-78	7449.72	1668.43	218.4	6.950731034	2.438186813	3.564728517	0.947815704
1978-79	7859.64	1985.41	228.1	5.215506054	3.189390618	3.991367022	-1.965251587
1979-80	7450.83	1754.45	223.6	-5.486771272	-1.509391771	-3.291059876	-0.686319625
1980-81	7985.06	1904.72	228.8	6.690369265	1.704545455	1.972337141	3.013486669
1981-82	8434.26	1800.32	238.1	5.325896996	2.929441411	-1.449742268	3.846197853
1982-83	8680.91	1854.56	241.4	2.841291984	1.025269263	0.731170736	1.084851986
1983-84	9362.69	1980.2	245.8	7.281881596	1.342554923	1.586203414	4.353123259
1984-85	9733.57	2079.92	250.1	3.810318311	1.289484206	1.198603792	1.322230312
1985-86	10138.7	2245.67	250.5	3.995498419	0.119760479	1.845217686	2.030520254
1986-87	10576.1	2326.23	256.3	4.136299512	1.697229809	0.865778534	1.573291169
1987-88	10949.9	2632.65	257.1	3.413723571	0.233372229	2.909805709	0.270545633
1988-89	12062.4	2956.54	259.6	9.222934351	0.722265023	2.738758819	5.761910508
1989-90	12802.3	3196.89	263.5	5.779048732	1.110056926	1.879561073	2.789430733
1990-91	13478.9	3794.36	267.4	5.019775367	1.093866866	3.936566377	-0.010657876
1991-92	13671.7	3167.69	270.6	1.410357592	0.88691796	-4.945796464	5.469236096
1992-93	14405	3577.1	271.8	5.090721783	0.331125828	2.861326214	1.898269741
1993-94	15223.4	3659.48	273.8	5.375923823	0.547845142	0.562784877	4.265293804
1994-95	16196.9	4372.24	275.3	6.010456296	0.408645114	4.075485335	1.526325847
1995-96	17377.4	4712.42	279.4	6.793076064	1.100572656	1.804699072	3.887804337
1996-97	18763.2	4755.26	282.5	7.385684417	0.82300885	0.225224278	6.33745129
1997-98	19570.3	5462.85	281.7	4.124206515	-0.212992545	3.238190688	1.099008372
1998-99	20878.3	5669.3	281.1	6.264695303	-0.160085379	0.910385762	5.51439492
1999-00	22549.4	6669.08	279.6	7.411055362	-0.402360515	3.74781829	4.065597587
2000-01	23484.8	6300.56	277.9	3.982957495	-0.458798129	-1.462250975	5.904006598
2001-02	24749.6	6588.27	272	5.110421897	-1.626838235	1.091750945	5.645509187
2002-03	25709.4	7086.37	270	3.732999862	-0.555555556	1.757246658	2.531308759
2003-04	27757.5	8199.25	264.5	7.378693102	-1.559546314	3.393237186	5.54500223
2004-05	29714.6	10640.41	264.6	6.586483969	0.028344671	5.735587257	0.822552041
2005-06	32530.7	12369.27	269.6	8.656707058	1.390949555	3.494264415	3.771493088
2006-07	35643.6	14023.69	272.4	8.73342341	0.77092511	2.94933074	5.01316756
2007-08	38966.4	16568.92	275.5	8.527150085	0.843920145	3.84036799	3.84286195
2008-09	41586.8	15703.33	281.8	6.30104389	1.676721079	-1.378035741	6.002358553
2009-10	45160.7	18412.63	287.1	7.913848122	1.384535005	3.678589099	2.850724017
2010-11	49185.3	21004.97	290	8.182561752	0.757499994	3.085388839	4.347172913
2011-12	52475.3	21832.59	296.5	6.269559202	1.644182125	0.947688753	3.677688324

[10] Central Statistical Organization, MOSPI, GOI, "New Series of National Accounts Statistics (Base Year 2004-05)"
[11] Ibid

IV. Concluding remarks and suggestions:

The paper reveals a clear difference of TFP in explaining GDP growth rate for the pre and post reform periods of Indian economy. TFP has been growing at the rate of3.93 % on an average during post –reform period compared to that of 1.28 % during the pre – reform period. Contribution of technical progress and labor skill in explaining GDP growth rate increased by almost fourfold.This paper underlines the fact that, skilled labor power is far more important component in GDP growth rate than just absolute increase in labor force.

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