# Growth and Instability in India's Service Exports: A Policy Period Analysis

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### **Abstract**

After economic reforms of 1991, the service sector has become important for economic growth in India. International trade in services has accounted for 13.90 per cent of GDP as highest value during 2006. Trade in services also has been positively contributing towards trade balance during the last three decades. In 2017-18, service trade positively contributed \$111.319 billion against total trade deficit of \$160.036 billion. The growth of Indian economy is positively linked with the growth in trade in services. Therefore, trade in services has become an important attribute to economic growth. In this context, the present study has primarily attempted to measure growth and instability of the service export. It also analyzes the impact of reforms on growth as well as on instability of service export. The study period is sub divided into two parts pre and post reform period. The separate growth rates are measured and compared for pre and post reform period. The service trade data of different categories of services are included from 1980 to 2013 in accordance with BPM5. The samples of services include aggregate service export, commercial services, travel, transportation and other commercial services. The overall results indicate that there is significant difference in growth and instability for pre and post reform periods. Further, the trend in instability of service export is also found significant over the study period for pre and post reform period separately.

**Keywords:** Service, economic growth, Instability, pre and post reform period.

### Introduction

Service sector plays a very crucial role in economic growth and development. It provides a vital support to other sectors of the economy through finance, logistics and communication services. Increase in trade in various services has enhanced growth and productivity of different sectors of the economy. In the era of globalization, the inter-linkages or dependence among different sectors of the economy has become very crucial factor for their growth. In such situation, the importance of trade in service in generation for economic growth cannot be ignored.

Karmakar (2005) addressed the post 1990s Indian economy as a service economy. During 1990s, post reform period service trade has increased

remarkably. The economic reforms, globalization and increased in overall trade played as catalyst in growth of service trade. In the year 2017, the trade in service is accounted 12.783 per cent of GDP. It was highest in the year at 13.90 per cent in the year 2006. In the first quarter of 2018, service export has increased by 27.41 per cent. During the year 2017-18, India's current account deficit was amounted to \$48.72 billion. India always have deficit in merchandise trade but at same time service trade contributes positively to current account. Again in 2017-18, service trade positively contributed \$111.319 billion against total trade deficits of \$160.036 billion.

The growth of Indian economy is positively linked with growth in trade in services. Therefore, trade in services has become an important factor for economic growth. In this context, present study

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has primarily attempted to measure growth and instability of service exports. It also analyzes the impact of reforms on growth as well as instability of service exports. The study period is sub divided into two parts pre and post reform period. The separate growth rate is measured and compared for pre and the post reform periods.

### **Review of Literature**

Wadhwa (1998) deals with the export performance and policies of India and gives an appraisal of policies and export performance. The analysis has been done for the period of 1950-97 and for comparing different policies he has divided period into two sub periods like 1950-90 and 1991 onwards. The study concludes that the actual growth of India's exports during the period 1950-97 can be explained by the strengths and weaknesses of India's export policies. The analysis and appraisal of India's export performance show that India's relatively low export performance can be attributed distinctly to the domestic supply side constraints than to the adverse impact of unfavorable external factors.

Goyal, et al. (2000) discuss development and instability of agricultural exports in India. The semi-log model for compound growth rate and instability of exports are used. The results indicate decline in agricultural exports while increase in manufacture exports during the study period. The share of agricultural exports earnings has increased whileshare total exports have declined in during 1980-1995. Among the different agriculture exports, tea and coffee are the dominant exportable items during 1970s but later their share has declined. The aggregate agricultural exports have expanded at the yearly compound growth rate of around 25 percent during 1991-98. Chishti (2002) focuses on globalization and examines its negative effects on developing nations and also deals with concentration in distribution of income between developed and developing countries. Trade is discussed as an important factor in mechanism of income distribution. Intellectual property rights also is examined as important factor for growing income inequality between developed and developing nations and transfer of resources.Ram (2003) examines trend in trade of developing countries since 1970. The study takes up both developed and developing countries for analysis. Results indicates that there are positive trends in some cases but most of the developing countries have negative trends and suggests that there is some amelioration between 1980 and 1999. Tandon (2003) analyzes the performance of India's agricultural exports and imports during pre and post reform periods and to examine the growth and pattern of trade. The semi log model is used for finding out the annual growth rates. Chakraborty and Chakraborty (2005) analyze the post WTO phase for Indian Exports and compares it with China and also analyses the competitiveness, diversification trend and instability of Indian exports basket. For competitiveness RCA (Revealed Comparative Advantage) index is used. The study finds that diversification of the export basket has slightly increased, index of instability is quite significant for a number of commodity groups at major export destinations and also the competitiveness of a number of product groups has declined in the post-WTO phase. Nandi and Kumar (2005) attempt to empirically test the variability of exports and imports of India by using unit root, Cointegration test and Granger Causality Test. The results highlight that growth of imports cause the growth of exports in Granger sense but opposite causality is not found as causality from growth of exports to growth of imports. It means that globalization of Indian economy which opens up to global markets, at first leads to increase in imports and then only increase in exports has taken place.

### **Objectives**

The present study has following objectives:

- To measure the growth of service exports for pre and post reform period.
- To measure the instability of service exports.
- To identify trend in instability index over the study period.
- To identify and compare the trend in instability index for pre and post reform period.

### **Data and Methodology**

The study analyses the service trade of different categories of services for the period from 1980 to 2013 in accordance of BPM5. Samples of service include exports of aggregate services, commercial services, travel, transportation and other commercial services.

### Methodology

To analyze the impact of various policies on service trade, we divide the study period i.e. 1981 to 2017 into pre and post reform periods.

Pre-reforms period 1980 to 1990 Post-reforms period 1991 to 2013

The study has been divided into three sections. The first section covers the measurement of growth during pre and post reform periods. Second section, the instability index is developed to measure the instability in service trade. The last section will cover the identification of trend in instability for pre and post reform period.

#### **Measurement of Growth**

The semi- log regression model is used to measure the growth of trade in different services. In the model, service trade is explained as function of time. The semi log regression equation can be expressed as follow:  $Y = e^{\alpha + \beta . t}$ 

After taking Log both sides

 $LnY = \alpha + \beta .t + u_{\star}$ 

Where, LnY= natural log of service trade

 $\alpha$  = Intercept

 $\beta$  = Slope (growth rate)

u = error term

The above equation will measure the growth rate of service trade for the study period. The slope,  $\beta$  is growth rate i.e. Annual compounding growth rate (ACGR) which indicates relative change in service trade over the time period considered.

### Growth for policy periods- pre and post reform

The above equation cannot measure growth for pre and post reform periods separately without a policy change variable. So, to overcome this problem, we introduced dummy variable for policy period in above semi log regression equation. Now, the dummy variable for policy period will help to measure growth rate for pre and post reform periods. After the introduction of dummy variable, new equation will be as follow:

 $LnY = \alpha_1 + \beta_1 \cdot t_0 + \alpha_2 \cdot D_1 + D_1 \beta^2 \cdot t_1 + u_t$ 

Where LnY = natural log of Y

 $\alpha_1$  = Intercept for pre-reform period

 $\beta_1$  = Slope (growth rate) pre-reform period

D<sub>1</sub>= dummy variable for policy period

 $t_0$  = pre-reform period

 $t_1 = post reform period$ 

 $\alpha_2$  = difference in intercept of pre and post reform period

 $\beta_2$  = difference in slope (growth) of pre and post reform period

 $u_t$ = error term

Therefore, the above equation will help to measure the both pre and post reform periods. The intercept and slope for both the periods can be compared as follow:

### Period Intercept Slope (growth)

Pre-reform period  $\alpha_1$   $\beta_1$ Post-reform period  $\alpha_1 + \alpha_2$   $\beta_1 + \beta_2$ 

#### **Measurement of Instability Index**

There are various approaches available to measure instability of a variable. The study of Kaushik and Klein (2008) used difference of log value of actual exports and log value of estimated exports to measure export instability. Love (1992) used the absolute value of actual export from five year moving average of export values as a measure of instability of export to examine the relationship between export instability and growth.

Kundal (2005) considered only random variation to measure instability index. The instability index is defined as the standard deviation of observed deviation from estimated exponential time trend.

In this study, the instability index proposed by Chand (2013) is adopted. Instability of Indian exports are measured on the basis of following formula as proposed by Murthy and Chand (2014).

Instability Index= ABTREND/(Predicted value of Exports)

Where,

ABTREND = Absolute Trend

Absolute Trend = |DTREND|

DTREND = Actual exports value - Predicted exports value

As explained by Murthy and Chand (2014),

 $Y=e^{(a+\beta T)}$ 

Taking log both sides,

 $LnY=a+\beta T+u$ 

After applying regression equation following is the estimated equation,

Ln Y= $a+\beta$ .T

Y =natural log of value of export item

 $\mu t = error term$ 

Instability index of export items of India, Instability Index= |Y-exp(LnY)|/exp(LnY) X 100 Trend in Instability Index

After measuring instability index, the trend is measured for study period i.e. 1980-2013. In following regression equation instability index as dependent and time as independent variable are taken.

 $Y=a+\beta.T+ut$ 

Where, Y = instability Index

T = time

Pre and Post reform trend in Instability

After identifying overall trend in instability of service export for all different categories of service export, trend for pre and post reform period is analyzed. The dummy variable is included in model to measure trend separately for both the period. After incorporating dummies the equation will be as follows:

 $Y=a+\beta_1.T+\beta_2.D+ut$ 

Where, Y = instability Index

T= time

D = Dummy variable

 $t_0$  = Pre reform period (1980-1990)

 $t_1 = Post reform period (1991-2013)$ 

### **Results and Analysis**

Measurement of Growth

To measure growth of different categories of service exports, the log value of service exports is regressed over time in a semi log regression model. The regression equation includes dummy variable for pre and post reform period. The growth rates is found significant for both pre and post reform periods. The dummy for reform policy period is also found significant at 5 per cent level. The following table indicates result of growth model of different

categories of services.

### Table 1: Semi Log regression results in Appendix

The growth for pre reform period is measured by  $\beta 1$  i.e. coefficient of time variable. All the  $\beta 1$  values are found significant for all the five categories of services. The post reform period is measured as sum of  $\beta 1$  and  $\beta 2$  value. The  $\beta 2$  coefficient of slope dummy for reform period is also found significant at 5 per cent level for all different services which indicates that reforms has significant and positive impact on service exports. During post reform period, service exports have recorded impressive growth rate.

### Table 2: Growth – Annual Compounded Growth Rate (in per cent) in Appendix

Table 2 indicates thatthe growth rate for all five categories of services has significantly increased during the post reform period. The other commercial services record highest growth in both pre and post reform periods. But the transport services growth has emerged as fastest growing service category. The growth rate has increased from 1.59 per cent to 11.22 after the reforms. The aggregate service has increased from 4.18 to 18.16 percent during the reform period. The overall growth rate during the period 1980 to 2013 is measured as 13.61 per cent. The overall growth results indicate that Economic reforms after 1991 have positively contributed towards the exports of services.

#### **Instability Index**

The instability of service exports is measured by absolute difference between actual and predicted value of service exports over the period 1980 to 2013. First, the instability index is calculated for all five categories of service exports and after that the trend in instability index is measured. The trend in instability index is measured in two parts with and without dummy for pre and post reform period.

The overall trend is measured without including the dummy in regression equation while the trend for pre and post reform period are measured by incorporating dummy in equation. Firstly, the predicted value of exports is calculated as

Ln Y=a+b.T+ut

Where

Ln Y = log value of service export

T = Time

After applying regression equations following equations are attained:

### **Table 3: Estimated Value of Y for different services in Appendix**

Absolute difference is equal to  $|Y-(\exp \hat{Y})|$  and

### Instability Index = $|Y-(\exp \hat{Y})|/\exp \hat{Y})X100$

The following table 3 is showing instability index of different services over the period 1980 to 2013.

## Table 4: Instability Index (in per cent) in Appendix

Table 4 indicates different values of instability Index for different categories of service exports over the period 1980-2013. The highest value of instability index i.e. 105.94 is measured for other commercial service exports for the year 1984 while the lowest index i.e. 0.32 for commercial services in the year 1986. The highest index is recorded as 109.07, 108.39, 105.94, 53.45 and 114.91 for service, commercial service, other commercial service, transport service and travel service export s respectively. The lowest index as 0.36, 0.32, 11.99, 0.16 and 1.78 are measured for services, commercial service, other commercial service, transport service and travel service exports respectively.

Now, the trend in instability index is measured by using regression equation. The trend value

will provide the clear picture of instability index over the period of the study. Table 5 depicts the regression estimates of instability index for five different services export.

### **Table 5: Estimation of Trend Equation in Appendix**

Table 5 shows regression coefficients for different categories of service export. The trend i.e.  $\beta$ coefficient of time variable is found insignificant for all five categories of service export except other commercial services and transport services. For only transport services the trend is found positive as well as significant. Contrarily, it found negative for service exports for commercial service, other commercial service and travel service exports. So only transport service has upward trend which indicates that instability in transport service has increased over the period of time. In case of other commercial service exports, downward trend is identified which means over the period of time instability in other service exports have decreased. For remaining three categories- aggregate services, commercial and travel service exports, the trend is found negative but insignificant.

#### Pre and Post Period Trend in Instability Index

In this section, the trend for pre and post reform period is measured for different categories of service exports by using dummy variable in trend equation. Following table 6 shows the results of regression results.

### Table 6 Estimation of Trend equation (with dummy) in Appendix

The results indicate that dummy variable used for pre and post periods found significant for all categories at per cent significance level except travel significant at 10 per cent level. The coefficient of time variable i.e.  $\beta 1$  also found significant but negative at 5 per cent level except transport services

which is significant at 10 per cent.

### Table 7: Pre and Post Trend of Instability in the Appendix

The table 7 depicts the pre and post reform period trend for all five categories of services. The post reform trend value is measured by sum of coefficients of time and dummy variables i.e.  $(\beta 1 + \beta 2)$ . The  $\beta 1$  value indicates trend value of pre reform period. The results show downward trend in instability for all different service exports except transport services. Only transport service instability records upward trend in post reform period. The results also highlight that the magnitude of trend has declined after the reform period. In the case of transport service results change from negative to positive. Overall the difference in trend is found significant for pre and post reform period. The significant difference is recorded only for slope but not for direction of trend in instability of all categories of services (except transport).

### Conclusion

After analysing service exports for the period from 1980 to 2013, the growth and instability is found significant for all five different categories of services. The service exports have recorded a significant growth across the different categories of services. The travel service exports have increased at highest rate i.e. 16.17 per cent over the last three decades. During the post reform period, all the service exports have increased at impressive growth rate i.e. approximately four time of pre-reform growth rates.

Secondly, the instability index of aggregate service exports calculated between 2 to 71 per cent which should be major concern for India's trade policy. The overall instability trend is found negative and significant; also all other exports services are negative while it is positive for transport service exports. For aggregate service exports no such

significant trend is identified. But during the post reform period,instability has declined for all five categories of services except transport services.

Therefore, for policy implication, it can be concluded that the economic reforms played a significant role in changing direction of service exports in India.

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**Table 1: Semi Log Regression Result** 

APPENDIX
Table 3: Estimated Value of Y for different services

Categories	Intercept	β1 (Growth)	Intercept Dummy	β2 (Slope Dummy)
Service export	21.69512	0.041758*	-1.891648*	0.139787*
Commercial Services	21.64125	0.045730*	-1.864088*	0.136401*
Other Commercial Services	21.69407	0.064620*	-2.431263*	0.159429*
Transport Services	19.67737	0.083017*	-0.834795*	0.056950*
Travel Services	20.82772	0.015893*	-1.037859	0.096313*

Category	Estimated equation
Service Export	$\widehat{Y} = 20.93862 + 0.136145 * T$
Commercial	$\widehat{Y} = 20.90308 + 0.137124 * T$
Service Export	
Other Commercial	$\widehat{Y} = 19.83128 + 0.161685 * T$
Service Export	
Transport	$\widehat{Y} = 19.36917 + 0.118993 * T$
Service Export	
Travel Service Export	$\widehat{Y} = 20.30649 + 0.091188 * T$

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Source: Author's Calculation

**Table 2: Growth – Annual Compounded Growth** Rate (in per cent)

Period	Service	Commercial Services	Other Commercial Service	Travel	Transport
Pre Reform Period	4.18	4.57	6.46	8.3	1.59
Post Reform Period	18.16	18.21	22.4	13.99	11.22
Overall	13.61	13.71	16.17	11.9	9.12

Source: Author's Calculation

**Table 4: Instability Index (in per cent)** 

	Service		Other commercial		Travel service
Year	export	service export		service export	
1980	109.07	108.39	79.12	53.45	114.91
1981	71.78	67.35	59.07	39.16	61.63
1982	57.17	56.60	79.42	20.41	37.30
1983	53.88	52.87	99.11	5.12	23.46
1984	31.92	31.63	105.94	6.38	29.29
1985	20.55	20.15	72.18	2.26	21.23
1986	0.36	0.32	13.76	10.20	7.32
1987	8.75	8.91	13.76	5.14	1.78
1988	10.23	9.56	17.58	14.74	6.07
1989	14.46	13.24	13.13	0.16	11.70
1990	16.60	14.79	13.81	0.38	13.29
1991	22.48	20.94	26.78	9.42	6.47
1992	32.23	31.24	53.40	14.63	6.42
1993	38.78	38.32	58.57	9.06	8.62
1994	36.84	35.58	55.87	11.42	12.22
1995	38.15	37.02	57.93	9.09	8.96
1996	42.33	41.71	63.15	1.89	8.85
1997	36.65	36.82	45.61	11.66	15.08
1998	29.06	31.70	28.27	28.40	20.90
1999	23.16	24.63	11.99	33.89	26.30
2000	22.89	24.79	13.34	37.02	22.66
2001	30.07	31.29	19.61	42.07	34.74
2002	31.44	31.79	19.78	37.95	42.22
2003	26.57	26.52	18.67	32.70	24.12
2004	2.63	2.82	17.35	13.53	4.24
2005	22.90	23.37	41.98	1.02	6.17
2006	42.38	43.12	65.15	17.86	11.67
2007	54.91	55.60	76.33	25.06	26.68
2008	66.61	67.20	87.04	42.09	27.52
2009	25.60	25.83	30.16	19.75	9.56
2010	38.52	38.67	35.85	28.22	30.13
2011	43.43	43.42	33.12	52.01	45.17
2012	31.84	31.82	24.92	33.44	34.50
2013	19.19	19.10	13.59	14.49	25.67

Source: Author's Calculation

**Table 5: Estimation of Trend Equation** 

Category	Intercept	Slope ß
Service export	40.06500	-0.350873
Commercial Services	38.77880	-0.288001
Other Commercial Services	59.18247	-0.919132*
Transport Services	11.54988	0.489686*
Travel Services	29.13706	-0.342555

**Table 6: Estimation of Trend equation (with dummy)** 

Category	Intercept	Slope β1	β2 Slope dummy
Service export	62.92341	-5.412379*	4.223837*
Commercial Services	61.70504	-5.364527*	4.236371*
Other Commercial Services	80.86962	-5.721288*	4.007409*
Transport Services	22.41412	-1.915968**	2.007524*
Travel Services	43.22502	-3.462031*	2.603210**

Table 7: Pre and Post Trend of Instability

Category	Pre Reform (β1)	Post reform (β1+ β2)
Service export	-5.412379	-1.18854
Commercial Services	-5.364527	-1.12816
Other Commercial Services	-5.721288	-1.71388
Transport Services	-1.915968	0.091556
Travel Services	-3.462031	-0.85882