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A STUDY OF ELASTICITY OF PUBLIC EXPENDITURE OF GOVERNMENT OF MAHARASHTRA

Dr. Ajay K. Dixit
Assistant Professor, Dept. of Economics, C.K.Thakur ACS College, New Panvel.

Abstract
Study of finance and study of public expenditure are the two important areas in public finance but study of public expenditure is more neglected compare to the study of finances. The present paper is an attempt to study the expenditure pattern of government of Maharashtra. To study the pattern we can take the help of elasticity of expenditure of the economy of Maharashtra. If elasticity of expenditure is greater than one, state is responsive in its expenditure programme which is considered as the Wagnerian hypothesis. The objective of the paper is to study the elasticity of expenditure of government of Maharashtra. But there are six possible versions of Wagner's law. All the six versions are considered in this paper. For the study, the secondary data is collected through RBI and State government publications. The result shows, except Goffman version, all versions shows less than one elasticity of public expenditure for the state of Maharashtra rejecting presence of Wagner's law.

Key Words: - Elasticity of Expenditure, Wagner's Law, Per Capita Income, Net State Domestic Product.

1. Introduction

Study of finance and study of public expenditure are the two important areas in public finance but study of public expenditure is more neglected compare to the study of finances. But, study of public expenditure is equally important from the fiscal policy and overall working of the economy point of view. The present paper is an attempt to study the expenditure pattern of government of Maharashtra. To study the pattern we can take the help of elasticity of expenditure of the economy of Maharashtra. If elasticity of expenditure is greater than one, state is responsive in its expenditure programme which is considered as the Wagnerian hypothesis. Maharashtra state is considered to be an industrially developed state in the Indian federation. Naturally, elasticity of expenditure is expected to be higher than one. Here, we have to test whether the state is having more than one elasticity of public expenditure or not. Elasticity of expenditure is studied for thirty years data from 1975 to 2005.

2. Objectives of Study

1. To study the pattern of expenditure of Maharashtra state over a period of thirty years i. e. from 1975-76 to 2005-06.
2. To study the six versions of Wagner's law for the state of Maharashtra over a period of thirty years i. e. from 1975-76 to 2005-06

3. Hypothesis of the Study

Hypotheses of the study are as follows;

1. Elasticity of public expenditure for the state of Maharashtra is greater than one.
2. Elasticity of public expenditure for all the six versions of Wagner's law for the state of Maharashtra is greater than one.

4. Scope of the Study

The study is restricted to expenditure of government of Maharashtra only. No consideration of expenditure of central government. At the same time, there is no consideration of private expenditures or the expenditures of public sector undertakings. The study will take into account the period from 1975 to 2005.

5. Data Collection and Methodology of Study

Data for study is collected through secondary sources only which includes budget documents of the state of Maharashtra. Data also collected from Reserve Bank of India bulletin and state finances: a study of the budgets of the state governments. Economic surveys of Maharashtra were also helpful in providing data on NSDP and Per capita income of the state. Here we use regression method to arrive at the results of compound growth of expenditure, NSDP and per capita income of the state. To test law we can use instantaneous and compound growth rates of public expenditure and NSDP over the period of thirty years. This we have given in the following way in total expenditure-total national income and per capita expenditure-per capita national income.

6. Review of Literature

Empirical study of the state expenditure policy and its impact on the other variables, relationship with national income and

other variables was studied by the German economists Adolph Wagner. This law of the Wagner is explanatory rather than prescriptive in character. According to Wiseman and Peacock, "Its aim is to establish generalizations about government expenditure, not from postulates about the logic of choice, but rather by direct inference from historical evidence." Adolph has based his law of increasing state activities on historical facts. Adolph Wagner arguing that government expenditure must increase at an even faster rate than output. According to Wagner, income elasticity of the public expenditure is greater than unity. It means that rate of increase of government expenditure is greater than the rate of increase of the economy. Arthur Mann tries to test this law but has got contradictory results. Here we test this law for budgetary expenditure of the government of Maharashtra.

7. Statistical Results

Regression is run by taking expenditure categories as dependent variable and NSDP and per capita income as independent variable in finding out elasticity of expenditure to NSDP. Regression results of six versions of double log model or log linear or constant elasticity model are summarized in table no.1. Regression analysis has been used for broad categories of expenditure to see elasticity of expenditure with NSDP of the state. All this econometric part is based on functional forms elaborately explained in D.M. Gujarathis' book of Econometrics. Computation of regression results are done with 'R' statistical package.*

Table no. 1- Six versions of Wagner's law

Version	WP traditional	Pryor	Goffman	Musgrave	Gupta Michas	P-W Share
Intercept	-1.06	-1.82	-0.62	-1.52	-1.08	-1.528
Coefficient	0.939	0.985	1.10	-0.018	0.927	-0.014
SE I	0.16	0.199	0.177	0.283	0.154	0.296
SE C	0.014	0.018	0.019	0.031	0.017	0.026
t-I	-6.54	-9.118	-3.52	-5.370	-7.022	-5.158
t-C	63.63	54.23	55.58	-0.586	53.81	-0.556
R^2	0.99	0.990	0.99	0.012	0.99	0.010
R^{-2}	0.99	0.990	0.99	-0.023	0.99	-0.024

All intercepts and coefficients are significant at 0.1% level of significance except Goffman Version. SE I- Standard error of Intercept, SE C- SE of Coefficient, t-I & t-C stands for t values of intercept and coefficient, R^2 & R^{-2} are Multiple and adjusted R2.

7.1 Log linear model for total expenditure and NSDP: - Log linear model has been used to see elasticity of expenditure with NSDP. For this we have used econometric models formulated by Arthur Mann. Arthur Mann has used the different interpretations of Wagner's Law. We are applying these versions for Maharashtra. These versions are as follows;

i) Peacock- Wiseman traditional version: - Here total expenditure is a function of NSDP of the state. It is used by Wiseman and Peacock to interpret Wagner's law.

EXP= f (NSDP)

EXP=a+bNSDP+u ----------Equation-II

Wiseman-peacock traditional version gives coefficient value of 0.939 which is significant at o.1% level of significance. Elasticity of public expenditure with NSDP of the state is less than one. This indicates that growth in government expenditure is less responsive to changes in the state income for the period of thirty years. Multiple R squared and adjusted R square is 0.99 which is indicative of maximum explanation of government expenditure by NSDP.

ii) Pryor version: - Pryor considered that Wagner's interpretation of expenditure is not total expenditure but it is consumption expenditure. With the progress of society, consumption expenditure of the state increases. While applying to Maharashtra instead of taking consumption expenditure we have used revenue expenditure of the state as the nearest aggregate for consumption expenditure.

REVEXP= f (NSDP)

REVEXP=c+dNSDP+v ----------Equation-III

Pryor version can provide same explanation since coefficient value here is 0.985 and significant at 0.1% level of significance, which is reaching to one but it is not one so we can conclude that this version like previous fails to provide explanation of government expenditure with the help of NSDP of the state.

iii) Goffman version:- In the opinion of Goffman, Wagner's law would be interpreted as expenditure is a function of per capita income of the society.
EXP= f (NSDP/POPUL)
EXP= e+fNSDPP+w ----------Equation-IV

With the help of Goffman version we have coefficient value of NSDP as 1.10 and significant at 1% level of significance, which is more than one showing greater proportionate increase in government expenditure than proportionate increase in per capita NSDP of the state. Multiple R squared and adjusted R squared both are showing 0.99 value. It means that model is well explained. This indicates that growth in population in Maharashtra is higher which reduces value of per capita income and in turn expenditure of the state is higher than per capita income growth in the state.

iv) Musgrave version: - In Musgrave's analysis of Wagner's law, instead of expenditure, the share of expenditure in national income is considered. This new variable is a function of per capita income of the society.
EXP/NSDP= f (NSDP/POPUL)
EXNSDP= g+hNSDPP+U ----------Equation-V

Musgrave version of Wagner's law for the Maharashtra shows -0.018 value of coefficient and significant at 0.1% level of significance, which indicate that negative relationship between share of expenditure in EXP and NSDP.

v) Gupta/Michas version: - According of Gupta and Michas, Wagner's law would be interpreted as; per capita expenditure of society is a function of per capita income.
EXP/POPUL= f (NSDP/POPUL)
PCE= i+jNSDPP+V ----------Equation-VI

Here the value of coefficient is 0.927, significant at 0.1% level of significance. Value of R^2 and adjusted R^{-2} stands at 0.01 which indicates a poor explanation of expenditure by NSDP. Even, elasticity of PCE to per capita NSDP is less than one which rejects presence of law in the case of Maharashtra.

vi) Peacock- Wiseman share version: - Peacock- Wiseman share version explain Wagner's law in terms of share of expenditure in national income is a function of national income.
EXP/NSDP= f (NSDP)
EXNSDP=k+lNSDP+W ---------- Equation-VII

Here, too, value of coefficient is 0.014 i.e. less than one which indicates that explanation of share of expenditure in national income is not provided by national income alone.
Abbreviations in the equations will be;

EXP- Total combined expenditure of Maharashtra, REVEXP- Revenue expenditure of Maharashtra, NSDP- Net state domestic product of Maharashtra, POPUL- Population of Maharashtra, a,b,c,d,e,f,g,h,I,j,k,l- Intercepts and coefficients, u,v,w,U,V,W- Disturbance terms, NSDPP- Net State Domestic Product/ Population, PCE- Per Capita Expenditure
EXNSDP- Expenditure/NSDP

8. Conclusion

All these versions except Goffman version, shows that elasticity of public expenditure of Maharashtra is less than one for the period of thirty years from 1975-76 to 2004-05. This will reject presence of Wagner's law in case of Maharashtra state. Rejection of hypothesis and Wagner's law for the state of Maharashtra may be attributed to following reasons;

1. There is no consideration of other socio-economic and political factors which can influence public expenditure programme of the state.
2. In the Indian federation, central and local self government also has their expenditure programme which can influence the nsdp of the state.
3. Expenditure programme of public sector undertakings and the private sector can also influence the NSDP of the state.
4. Lastly, rejection may be because of the fact that state governments in India do not enjoy right to borrow and spend as the case may be for the central government. This limits their expenditure programmes.

5. But, results of regression analysis confirms that broad pattern of expenditure of government of Maharashtra can not be explained with the help of NSDP only.

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Statistical Appendix

Table no. 2 - Total expenditure, per capita expenditure, NSDP and per capita income of Maharashtra with growth rates.

Year	TE(Lac)	GR TE	PCE(Rs)	GR PCE	NSDP(Cr.)	PCSI(Rs.)	GR NSDP	%TE/NSDP
1975-76	135851		245.448		7676.8	1387		17.7
1976-77	149915	10.35	265.152	8.03	8573.6	1516.4	10.46	17.49
1977-78	165857	10.63	287.02	8.25	9624.8	1665.6	10.92	17.23
1978-79	208066	25.45	352.275	22.7	10658	1804.5	9.694	19.52
1979-80	228940	10.03	379.251	7.66	12145.7	2012	12.25	18.85
1980-81	261278	14.13	419.63	10.6	15113.3	2427.3	19.64	17.29
1981-82	308786	18.18	485.68	15.7	16965.8	2668.5	10.92	18.2
1982-83	358518	16.11	551.8	13.6	18277.4	2813.1	7.176	19.62
1983-84	424397	18.38	639.035	15.8	21151.6	3184.9	13.59	20.06
1984-85	506309	19.3	746.419	16.8	22628	3335.9	6.525	22.38
1985-86	573148	13.2	828.528	11	26467	3826	14.5	21.66
1986-87	641185	11.87	900.965	8.74	28431	3995	6.908	22.55
1987-88	692892	8.064	951.624	5.62	33770	4638	15.81	20.52
1988-89	810163	16.92	1086.97	14.2	40472	5430	16.56	20.02
1989-90	973707	20.19	1275.9	17.4	50139	6570	19.28	19.42
1990-91	1077226	10.63	1378.38	8.03	58137	7439	13.76	18.53
1991-92	1205156	11.88	1509.38	9.5	65808	8242	11.66	18.31
1992-93	1401356	16.28	1721.05	14	82076	10080	19.82	17.07
1993-94	1698312	21.19	2050.98	19.2	101767	12290	19.35	16.69
1994-95	2002633	17.92	2374.31	15.8	116507	13813	12.65	17.19
1995-96	2137646	6.742	2487.92	4.79	140730	16379	17.21	15.19
1996-97	2500495	16.97	2811.84	13	158682	17844	11.31	15.76
1997-98	2767514	10.68	3050.29	8.48	195168	21511	18.69	14.18
1998-99	3031719	9.547	3276.92	7.43	214557	23191	9.037	14.13
1999-00	3824361	26.14	4051.82	23.6	247830	26257	13.43	15.43
2000-01	4220819	10.37	4389.08	8.32	252283	26234	1.765	16.73
2001-02	4247958	0.643	4337.95	-1.2	274113	27992	7.964	15.5
2002-03	4721738	11.15	4751.66	9.54	300476	30238	8.774	15.71
2003-04	5387818	14.11	5343.41	12.5	341424	33861	11.99	29.63
2004-05	7086432	31.53	6909.18	29.3	387390	37770	11.87	30.58

Source: - Economic survey of Maharashtra state –Various issues, Financial statements- Green Books: Various issues, State Finances- A Study of Budgets- Various issues, RBI, RBI Bulletin- Various issues.

TE- Total expenditure, GRTE- Growth rate of total expenditure, PCE- per capita expenditure, GRPCE- Growth rate of PCE, NSDP- Net state domestic product, PCSI- Per capita state income, GRNSDP- Growth rate of NSDP, %TE/NSDP- Percentage of total expenditure to NSDP.