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WAGNER'S HYPOTHESIS
AND
PAKISTAN'S ECONOMY

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INTRODUCTION

Economists have long been concerned with the expansion of public expenditure with a view to analysing the relationship between government expenditure and level of economic development. In a pioneering work on the subject, A. Wagner formulated the hypothesis of expanding state expenditures after surveying the public expenditure records of several Western countries, particularly Germany.

Wagner postulated that growth of population accompanied by increased urbanization and the emergence of strong local opinions require higher public spending on law and order and socio-economic regulations. Further, technological demands for capital of an industrializing economy are not met by the private sector. Therefore, the state has to move ahead for huge expenditures.

Wagner argued that there is a Persistent tendency towards an increase in the functions of state. New functions are continually undertaken on a large scale and old functions are being performed more efficiently /4/.

In brief, relationship between public expenditure and level of economic development, generally known as "Wagner's Law" can be stated as below:

> "As real per capita income increases in industrializing nations, their public sectors grow in relative importance. This growth is associated with technological and institutional changes and wider political participation" /16/.

The objective of the present study is to test the applicability of "Wagner's Hypothesis in case of Pakistan.

REVIEW OF LITERATURE

Wagner's Hypothesis has been tested with data (time series as well as crosssection) from a number of developed and underdeveloped countries.

Beck /2/ concludes "in real terms, the era of public sector growth in most developed economies may have ended. More specifically between 1950 and 1970, the income elasticity of real expenditure by government was less than unity in eight out of the thirteen countries examined. Hence, real size of the public sector had actually declined over the period".

Diamond /5/ taking the sample of 41 countries including Africa, Asia and South and Central America, concludes "there is every indication that such a presentation (Wagner's Hypothesis) is unjustified.

Ganti and Kolluri /9/ have found efficient estimates of income elasticities of demand for non-defense government expenditure and their findings support strongly Wagner's Hypothesis.

Khan /15/ has examined only Traditional Peacock-Wiseman version and estimated point elasticities for the economy and its sectors and their categories. Wagner's Hypothesis is true for the economy but the rest of the results are mixed.

Murthy /18/ has provided the evidence confirming the validity of the Wagner's Hypothesis of public expenditure in India.

Nitti /22/ after careful study of expenditures in various countries as far back as acceptable statistics exists, concludes "centralized and decentralized governments, warlike and peaceful nations, large and small nations, show essentially similar tendencies toward marked increase, particularly during the 19th century".

Peacock and Wiseman /25/ have tested Wagner's Hypothesis with Britain's data and they found it working.

Pryor /26/ concludes that neither highly developed nor highly under developed countries fit Wagner's generalization.

Examining the validity of Wagner's Hypothesis over the post World War II period for a sample of 34 countries, Wagner and Warren /27/ found that there are countries for which it holds but there are countries for which it clearly does not hold. According to them "in any event, the weight of evidence is sufficiently inconclusive to suggest that there is not universal Wagnerian law of public spending".

METHODOLOGY

Wagner outlined his hypothesis in general terms, covering institutional changes, industrialization, democratization etc. Sweeping generalization of the Hypothesis has made it difficult to test statistically. However several economists have defined the functional relationship between economic progress and the relative growth of public sector /16/.

i) Traditional Peacock-Wiseman Version: $E = f\ (GDP)$

E = Level of government aggregate expenditure.
GDP=Gross Domestic Product

ii) Proyor version: $C = f\ (GDP)$

C =Level of government consumption expenditure.

iii) Goffman version: $E = f\ (\frac{GDP}{P})$ P = Population

iv) Gupta-Michas version: $\frac{E}{P} = f\ (\frac{GDP}{P})$

v) Musgrave version: $\frac{E}{GDP} = f\ (\frac{GDP}{P})$

vi) Modified Peacock-Wiseman version : $\frac{E}{GDP} = f\ (GDP)$

Usually recourse is there to some form of elasticity measurement to depict the growth of public expenditure to an income variable /17/.

If $\beta <$ 1⟹ Increase in income will cause the ratio of government activity to income to fall

If $\beta > 1 \Longrightarrow$ Increase in income will cause the ratio of government activity to income to rise.

With this framework, it is necessary that elasticity coefficient should be greater than one for "Wagner's Hypothesis" to hold good. It is a convention to use GDP as an income variable while testing Wagner's Hypothesis, however in the case of Pakistan, GNP is more pertinent.

Wagner's Hypothesis has normally been tested with cross-sectional data. However, a conceptually superior approach to test the hypothesis is to examine the same country and at different levels.

The above six versions have been tested with data taken from /7/, /21/, /23/, /24/. It may be noted that the data used is at 1959-60 prices. Various factors underline the need to test the hypothesis in sub-periods. Firstly, the condition of wider political participation was an essential element in formulation of the hypothesis. As the political history of most of the developing countries revolve around multidimensional political crisis, it is appropriate to test the hypothesis in suitable periods.

Secondly, the economic development is a long run process, so to explore the trends of economic development, it is logical to subdivide the period under consideration.

Finally, the two periods chosen (1959/60 to1971/72 and 1972/73 to 1986/87) have markedly different structural characteristics e.g. separation of East Pakistan in the first period and devaluation of rupee, large-scale nationalization of industrial sector and huge amount of remittances in the second period.

Wagner also argued that his 'hypothesis' is equally valid at sectoral level. Besides the sectorial analysis, this study generalizes the argument to decompositions of the sectors.

RESULTS

Log linear form has been estimated in order to get elasticity coefficients directly. Table 1 presents the results of six versions of Wagner's Hypothesis over the period 1959/60-1971/72, 1972/73-1986/87 and 1959/60-1986/87 respectively. Keeping in mind the validity condition for Wagner's Hypothesis, the Table explicates that elasticity coefficients have slimed down over time (Traditional Peacock-Wiseman and Gupta-Michas version fail to support the hypothesis in the period 1972/73-1986/87), implying that public expenditure grew more rapidly in the period 1959/60-1971/72 than the period 1972/73-1986/87. It appears (on the basis of R^{-2}) that "Pryor version" is a better mirror of Wagner's Hypothesis among its class. It is evident from the table that "Modified Peacock-Wiseman" and "Musgrave" versions do not hold for Pakistan's economy in the respective periods. Finally, "Goffman version" yields the higher value of elasticity coefficient than the other version in all the periods.

Table 2 is informative about defence,non-defence, non-development and development expenditures (Consolidated Federal and Provincial) over the period 1975/76-1986/87. All the five versions show that non-defnece and non-development expenditures grew more rapidly than the defence and development expenditures respectively. It also may be noted that "Traditional Peacock-Wisemand" and "Goffman version" do not hold for development expenditure.

Table 3 stands for the consolidated provinces expenditures from 1971/72 to 1983/84. It appears that expansion in development expenditures lags behind the non-development expenditures and the "Traditional

Table 1

RESULTS OF EACH VERSION OF WAGNER'S HYPOTHESIS
(TOTAL PUBLIC EXPENDITURE)

Version [**]		Elasticity Coefficient	T-Value	R^{-2}	D.W.
A	a	1.04	6.08	0.75	-
	b	0.91	10.69	0.89	1.93*
	c	1.11	12.96	0.86	1.61
B	a	2.00	8.49	0.77	-
	b	1.65	8.46	0.84	1.90*
	c	2.21	11.60	0.84	1.66*
C	a	1.13	3.49	0.48	-
	b	0.81	5.10	0.66	1.95*
	c	1.22	7.08	0.65	1.61
D	a	0.04	0.25	-0.08	-
	b	-0.92	-1.08	0.01	1.93*
	c	0.11	1.28	0.02	1.61*
E	a	0.13	0.40	-0.07	-
	b	-0.19	-1.18	0.03	1.95*
	c	0.22	1.29	0.02	1.61*
F	a	1.22	7.83	0.83	-
	b	1.20	17.84	0.95	1.32
	Cc	1.09	26.31	0.96	1.50

* Adjusted for autocorrelation

a Represents the period 1959/60-1971/72
b Represents the period 1972/73-1986/87
c Represents the period 1959/60-1986/87

** Following specification is for all the tables:

A : Traditional Peacock-Wisemand version
B : Goffman version
C : Gupta-Michas version
D : Modified Peacock-Wiseman version
E : Musgrave version
F : Pryor version

Table: 2

RESULTS OF EACH VERSION OF WAGNER'S HYPOTHESIS (FEDERAL AND PROVINCES 1975/76 to 1986/87)

Version		Elasticity Coefficient	T-Value	R^{-2}
	a	1.23	13.07	0.93
	b	1.40	13.85	0.94
A	c	1.33	16.23	0.95
	d	0.40	3.85	0.56
	a	2.29	12.17	0.90
B	b	2.62	13.67	0.94
	c	2.49	15.45	0.95
	d	0.74	3.32	0.55
	a	7.70	24.90	0.98
C	b	8.02	35.55	0.99
	c	7.90	33.03	0.99
	d	6.14	28.63	0.98
	a	4.66	36.34	0.99
D	b	4.83	55.90	0.99
	c	4.76	54.02	0.99
	d	3.83	45.11	0.99
	a	8.70	28.13	0.98
E	b	9.02	39.98	0.99
	c	8.90	37.21	0.99
	d	7.14	33.29	0.99

a   Defence expenditure
b   Non-defence expenditure
c   Non-development expenditure
d   Development expenditure

Table: 3

RESULTS OF EACH VERSION OF WAGNER'S HYPOTHESIS (ALL PROVINCES EXPENDITURE 1971/72 TO 1983/84)

Version	Elasticity Coefficient	T-Value	$\overline{R}^{-2}$
	a 0.72	2.14	0.23
A	b 1.44	7.98	0.94
	c 1.18	6.12	0.75
	a 1.43	2.25	0.25
B	b 2.74	7.65	0.83
	c 2.26	6.21	0.76
	a 9.13	9.16	0.87
C	b 10.43	13.33	0.93
	c 9.96	12.38	0.92
	a 5.30	10.20	0.89
D	b 6.01	15.84	0.95
	c 5.75	14.73	0.94
	a 6.08	6.21	0.77
E	b 11.43	14.61	0.95
	c 10.96	13.63	0.93

a   Development expenditure
b   Non-development expenditure
c   Total expenditure

Peacock-Wisemand versions" fails to support Wagner's Hypothesis in this category.

Table 4 is elaborative of Federal Expenditures over the period 1971/72-1983/84. It is the only classification where growth in development expenditures surpasses the growth in non-development expenditures and all the five versions hold.

Table 5 deals with education expenditures over the period 1959/60-1986/87. It is noted that growth in non-development expenditures exceeds the growth in development expenditures and all the five versions of Wagner's Hypothesis hold in this sector of the economy.

Table 6 shows the growth in Health Expenditures over the period 1960/61-1980/81. It shows that only "Traditional Peacock-Wiseman" and "Goffman version" support the validity of Wagner's Hypothesis in this area.

Table: 4

RESULTS OF EACH VERSION OF WAGNER'S HYPOTHESIS
(FEDERAL EXPENDITURE: 1971/72 TO 1983/84)

Version		Elasticity Coefficient	T-Value	R^{-2}
A	a	2.29	3.80	0.53
	b	1.05	7.51	0.82
	c	1.65	4.56	0.62
B	a	4.29	3.62	0.50
	b	2.00	7.34	0.81
	c	3.11	4.35	0.60
C	a	11.9	8.33	0.85
	b	9.70	19.20	0.96
	c	10.81	11.73	0.92
D	a	6.86	9.97	0.89
	b	5.62	28.93	0.98
	c	6.22	15.14	0.95
E	a	12.99	9.03	0.87
	b	4.81	148.65	0.97
	c	11.81	12.82	0.93

a   Development expenditure
b   Non-Development expenditure
c   Total expenditure.

Total: 5

RESULTS OF EACH VERSION OF WAGNER'S HYPOTHESIS
(EDUCATION EXPENDITURE 1959/60 TO 1986/87)

Version	Elasticity Coefficient		T-Value	R^{-2}	D.W.
A	a	1.01	6.39	0.60	1.95*
	b	1.27	15.90	0.91	1.14*
	c	1.18	14.54	0.89	1.86*
B	a	2.04	6.41	0.61	1.93*
	b	2.42	10.97	0.82	1.30*
	c	2.32	11.94	0.84	1.77*
C	a	2.31	1.30	0.03	2.07*
	b	9.29	25.13	0.95	0.36**
	c	9.14	25.99	0.96	0.36**
D	a	4.33	14.09	0.88	1.90*
	b	5.12	36.31	0.97	0.19**
	c	5.05	37.64	0.98	0.22**
E	a	3.81	1.77	0:08	2.07 *
	b	10.29	27.84	0:97	0.36**
	c	10.19	28.83	0:96	0.36**

a   Development Expenditure

b   Non-development expenditure

c   Total expenditure

*   Adjusted for autocorrelation

** Cochrane-Orcutt Technique was applied but results did not improve satisfactorily.

Table: 6

RESULTS OF EACH VERSION OF WAGNER'S HYPOTHESIS
(HEALTH EXPENDITURE 1960/61 TO 1980/81)

Version	Elasticity Coefficient	T-Value	R^{-2}	D.W.
A	1.29	5.26	0.58	1.63*
B	2.45	4.03	0.44	1.58*
C	1.55	2.99	0.29	1.62*
D	0.29	1.17	0.01	1.63*
E	0.55	1.06	0.006	1.60*

*   Adjusted for autocorrelation

COMPARATIVE ANALYSIS

Other studies dealing with growth of expenditures over time in different economies are not comparable with the present study mainly because of differences in methodology. However, there is some room for comparison with the parent study. The source for the present study is Mann /16/. Mann's study does not go in to categories and decompositions. However, common features of both studies may reveal some informative results.

Table 7 shows that "Modified Peacock-Wiseman version" and "Musgrave version" do not hold for both economies in the respective periods and sub-periods. It also shows that "Goffman version" yields the highest value of elasticity coefficient for both the countries in the corresponding periods and sub-periods.

Table 7

WAGNER'S HYPOTHESIS: AS IT STANDS FOR MEXICO AND PAKISTAN

Different Version	MEXICO		PAKISTAN		
	1925-1976	1941-1976	1959/60-1986/87	1959/60 1971-72	1972/73-1986/87
A	1.06	1.10	1.11	1.04	0.91
B	1.09	1.24	2.21	2.00	1.65
C	1.03	1.10	1.22	1.13	0.81
D	0.36	0.39	0.11	0.04	-0.92
E	-0.06	0.05	0.22	0.13	-0.19
F			1.09	1.22	1.20

Source: Table 1, /16/

CONCLUSIONS

Pakistan has certainly enjoyed industrialization, technological improvements, institutional changes and hence offers a firm ground on which to test Wagner's Hypothesis. According to Wagnerian criterion, "Modified Peacock-Wiseman and Musgrave" versions do not hold for Pakistan's economy in the respective periods. In the disaggregated analysis, the period 1959/60 to 1971/72 surpasses the period 1972/73 to 1986/87, as the elasticity coefficients have reduced and some of the versions (Traditional Peacock-Wisemand and Gupta-Michas) do not hold in the latter period. So far, individual sectors are concerned, the results are mixed. However, in most of the cases, non-development expenditures grew more rapidly than the development expenditures. Further, growth in non-defence expenditures was higher than the growth in defence expenditures.

Though the results support the applicability of Wagner's Hypothesis to the Pakistan's economy, yet no prediction could be made as each country has had particular reasons while making decisions for increasing expenditures in different sectors of the economy. What it can do is to show some aspects of past reality.

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