PUBLIC EXPENDITURE AND SOCIO-ECONOMIC STRUCTURE IN THE DEVELOPED AND LDCs

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Introduction

The present paper was prompted by our dissatisfaction with the literature on the relationship between public expenditure and economic growth. In both the academic world and in national and international economic institutions a clear majority holds that the inverse proportion between economic growth and public spending is self-evident.

The cause and effect relationship is taken just as much for granted: other things being equal, a higher ratio of public expenditure to GNP is believed to *cause* a lower rate of economic growth. Many now consider this to be a "universal law" applicable in all circumstances, all economies, and all countries, and in particular in the less developed countries (LDCs), which have the greatest need for fast growth to narrow the gap separating them from the developed countries. Two recent works that take this approach are the articles by Landau (1983) and Singh (1985), both of which seek to provide an empirical demonstration of this "law".

In political and journalistic literature which is not strictly academic, however, the relationship is simply taken for granted; apparently there is no need felt for supporting evidence or proof. In the present article the first task we have set ourselves is to reconstruct the possible theoretical foundation of this approach.

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The conclusion drawn from an examination of the possible link between growth rates and the public expenditure/GDP ratio is that from the theoretical standpoint it is impossible, hence erroneous, to maintain that in general the two variables vary inversely. Even accepting many of the simplifications used in the models adopted, the relation between public spending and economic growth can assume positive or negative values depending on one's assumptions concerning the concrete nature of the expenditure and one's hypotheses on the behaviour of firm, or depend on the structure of the economy and the society in which the spending takes place. As to the possibility of deducing a cause and effect relationship from theoretical models, the hypotheses proliferate, and here again the direction of the relationship is most uncertain.

The second part of the paper deals more directly with the substance of the question. We have sought to develop and to provide empirical demonstration of the hypothesis of a direct correlation between the weight and structure of a country's public expenditure and its level of economic development.

The theoretical approach underlying this way of framing the question derives from the vast neo-marxist literature on the state and the role of public spending produced in the 1970s. For a variety of reasons in the past those theories had little impact on economic literature, in particular on the economic empirical analysis of the public expenditure and have even less influence today. One reason, perhaps, is that those works were felt to be sociological or political in approach, so that, owing partly to disciplinary boundaries and partly to the alleged neutrality of economic theory with respect to "social" factors, there was a sort of incommunicability between the two approaches. In addition the present crisis of keynesianism or of the welfare state can be another, more general, reason.

Our intent was to empirically analyse whether public expenditure varies with the structural situation in which it is located, and if so in what ways. We

have used two categories of countries - the developed and the LDCs - which we have considered most suitable to highlight such structural differences.

The structural situation i.e. the level of economic development, has been represented by a group of socio-economic variables, which have been correlated with a second group of variables concerning the relative volume of public expenditure and its structure.

In this context we have also analysed the problem of the relationship between economic growth and public expenditure.

Part. 1. Growth and Public Expenditure

1.1 *Introduction*

Most of the empirical research on the relationship between economic growth and public expenditure points out that there is an inverse correlation between the rate of economic growth and the ratio of public expenditure to GDP (1). Little if any attention is paid, however, to the theoretical justification for this empirical finding. One gets the impression that researchers feel this inverse correlation is so obvious as to be self - explanatory, and that the only relevant task left is to provide an accurate as possible measure of it.

In this first part of the article, we deal with some theoretical aspects of the relationship between public spending and economic growth. In the second part, we shall return to the empirical findings mentioned above, which are not at all so unambiguous and straightforward as is often supposed.

The issue of the relationship between economic growth and public expenditure is examined from two different conceptual standpoints - classical and post-Keynesian economics - to see whether there are sufficiently solid arguments for holding that an increasing share of public expenditure implies a declining rate of growth. Our conclusion is that neither framework provides any definite answer to the question of whether a relatively higher public expenditure curtails growth.

1.2 *Saving, investment, and public spending*

If a rationale for the inverse correlation of economic growth to the public expenditure/GDP ratio has to be found, it necessarily lies in the assumption that the expansion of expenditure by government implies not only that private investment is reduced (through a reduction in private saving to finance it) but also that

public expenditure does not contribute to the growth of social capital, that is it is 'unproductive'. It is from this point of view that the classical standpoint is interesting.

(i) The classical framework

In classical economic theory, all private savings are invested, so that the higher the propensity to save, the higher the rate of accumulation and growth in the economy, and the lower the rate of unemployment (2).

In this framework, an increase in the share of public expenditure could actually lower the rate of accumulation and growth. Financing a growing share of public spending diverts private saving from private investment, so that a smaller share of the surplus product is left to fuel the expansion of private productive capacity. However, this is the case only in one particular hypothesis, namely that all or most public spending is unproductive. The rate of growth is reduced if public expenditure is used to maintain unproductive workers (i.e, workers who produce no surplus).

Total surplus is

$$S = P - W$$

where P is total production and W is the necessary consumption of productive workers. S accrues to the capitalist class, and part of it, say tS, is taken by the state in the form of taxes. The remainder, (1 - t)S, is saved and invested. If tS goes to maintain unproductive workers, it is clear that as t rises the overall rate of accumulation and growth declines.

Classical economists certainly thought that the bulk of state expenditure was effectively unproductive and therefore regarded any expansion of it as an obstacle to growth. To some extent state expenditure might be necessary to allow the social system as a whole to function, but it nevertheless represents a direct curtailment to accumulation and growth.

At times, however, classical economists did seem to perceive that state expenditure is not necessarily, inherently unproductive; that it might also be destined to productive uses, that is to increase social capital and, hence, social productive capacity. (3) The construction of roads, bridges, and other infrastructures, as well as education, are types of public expenditure that produce an increase in social capital. It follows that if the state employs its resources for such purposes the growth rate is not necessarily affected negatively. (4)

Thus, the classical conceptual framework does not provide a definitive unambiguous answer to the question of whether an expansion of public expenditure necessarily implies a decline in the overall rate of growth. Under this theory, higher public spending does imply a lower rate of private accumulation but not necessarily slower aggregate accumulation and growth. In other words, using a modern terminology, an increasing public expenditure certainly crowds private investment out, but this does not necessarily mean that the economy as a whole has to experience a lower rate of accumulation and growth.

Therefore, if one wants to argue that the expansion of state expenditure causes a decline in the rate of growth, one must assume that the whole of the state's revenue is spent unproductively or at least that the unproductively spent share of that revenue is larger than the share of the private surplus that would be so spent.

(ii) The post-Keynesian approach

Looking at the relationship between growth and public spending from a Keynesian perspective, the simplest way of approaching the problem is through a model that is based on Domar's original model of growth, into which taxes and public expenditure are introduced. More precisely, we compare the equilibrium rate of growth deriving from the original Domar's model with the rate

we obtain from our modified version of Domar's model. (5)

Domar's model, as we know, yields an equilibrium rate of growth which is

$$g = s\rho$$

where s is the private propensity to save and ρ is the ratio P'/I, with P' denoting the increase in potential aggregate output and I investment. The ratio ρ, assumed to be constant, is called the 'potential social average investment productivity' by Domar. The rate of growth g, of course, is positively affected by increases in ρ and s.

Let us now consider a model with the following characteristics. Government levies taxes on the economy and makes public expenditures which are divided into public consumption and public investment. The government budget is assumed to be in equilibrium. (6) The potential average productivity of public investment is assumed to be equal to that of private investment. (7) Therefore we have the following equations.

$$P' = \rho I \tag{1}$$

$$I = I_P + I_G \tag{2}$$

where I_P is private investment and I_G public investment.

$$C' = (1 - s)(Y' - T') \tag{3}$$

$$T = tY' \qquad \text{where } 0 < t < 1 \tag{4}$$

$$tY' = I'_G + atY' \qquad \text{where } 0 < a < 1 \tag{5}$$

$$Y' = C' + I'_P + I'_G + atY \tag{6}$$

C' is the increase in private consumption, which depends on the increase in disposable income (Y' - T'); T' is the increase in taxes and t denotes the given tax rate; Equation 5 establishes the equilibrium gover-

nment budget with atY' denoting the share of government revenue which is spent on consumption goods; Equation 6 says that the increase in income depends on the increase in aggregate demand.

In order that, over time, the increase in actual production equals the increase in potential production, it must be:

$$P' = Y' \tag{7}$$

By substituting into Equation 7 from Equations 1-6 we reach the equilibrium rate of growth, that is, the rate which ensures the equality between the increases in potential and actual production. This rate, which we denote by g', is

$$g' = \rho[s(1 - t) + t(1 - a)] \tag{8}$$

The rate g' is more complex that g in Domar's model: g' is still directly related to ρ and s but it is also inversely related to t and a, even though not in an unambiguous way, as we shall see presently.

Comparing g' and g we can see whether the existence of government spending implies a lower rate of growth when it is assumed that in the two models the private propensity to save, s, is equal. It is easy to show that g' in (8) is lower than g if and only if

$$t[(1 - s) - a] < 0 \tag{9}$$

(1 - s) = c is the private propensity to consume, so that (9) can be written as

$$t(c - a) < 0 \tag{9'}$$

As t is positive by definition, (9') can be fulfilled only if $a > c$. a can also be defined as the government's 'marginal propensity to consume'. Therefore, it follows from (9') that the rate of growth of the economy is lowered by the existence of government expenditure only if the government 'propensity to consume' is higher than the private propensity. This means that the overall growth rate is diminished only if the government devotes a smaller share of its income to investment than

the private sector. In other words, government expenditure lowers the aggregate rate of growth if the government contributes less to the expansion of social productive capacity than does the private sector.

The results of this model fundamentally resemble those of the classical model. Public consumption may be regarded as unproductive expenditure, as opposed to public investment, which represents productive expenditure. Only if the government has, as it were, a higher propensity to unproductive spending than the private sector is the rate of growth lowered. If the government devotes its entire revenue to investment ('productive expenditure') the aggregate growth rate would be the highest possible rate given the private sector's marginal propensity to save.

In this case, a = 0 and

$$g' = \rho \, [\, s(1 - t) + t] \qquad (8')$$

g' is always higher than g in the original Domar's model. In fact, it can be easily seen that $g' < g$ if and only if it were $s > 1$, which is obviously impossible. In other words, in this case public intervention raises the aggregate social propensity to save.

1.3 *Some further remarks*

Thus, also in a Keynesian framework, there is no ground to hold that an increase in public spending does necessarily imply a decline in the overall rate of economic growth. On the contrary, under specific hypotheses, one could hold that a rise in the rate of growth can be achieved through an increase in public expenditure.

From Equation 8 above we can arrive at the following conclusion. If the 'public marginal propensity to consume' is lower than the private marginal propensity to consume, the way to increase the aggregate growth rate is to increase the share of public expenditure. This, assuming a balanced budget, means increasing tax revenue, (8) a policy measure that is often

regarded as implying a decrease in the rate of growth rather than the other way around.

In conclusion, therefore, it is not possible to provide a definite answer to the question concerning the effects of an increase in public spending on the overall rate of growth. In order to give a definite answer, one has to make a precise assumption on the composition of government expenditure; in particular a precise assumption is required on the government's 'propensity to consume'.

In our opinion, however, no specific hypotheses of this sort can be made without directly referring to empirical and historical analyses of specific countries. For this reason, we feel that it is somewhat improper to deal with the issue at a very high level of generality as most empirical studies do. What is required, first of all, is a study of the structural composition of public expenditure in different countries and an analysis of the factors determining that composition. These factors are likely to be social, political and economic in nature and to depend on the specific history of individual countries at different stages of development. Part 2 of this paper focuses its analysis on the composition of government spending in many countries, both less developed and industrialized.

In part 2, not only shall we consider empirical data in order to question the statistical validity of the hypothesis that a higher ratio of public spending to GDP is the cause of a lower rate of growth, but we will also consider the problem of the relationship between the *level* of GDP and the composition of GDP itself.

Part 2. Analysis of the data

2.1 *Introduction*

In the following part we analyse the structure of

public spending and its relationship to the economic structure of a large number of countries, both developed and LDCs. In our view the inclusion of LDCs in the analysis is useful to study in particular the relationship between economic growth and public expenditure. In fact very often LDCs can be taken as examples of the contrast between economic growth and increasing weight of public spending.

The unreliability of the data on LDCs is a longstanding problem. And, in regard to the analysis of public expenditure this shortcoming is nothing short of dramatic. The consequence of this state of affairs, unfortunately, is that our choice of countries to be studied and the public spending variables analysed has been decisively conditioned by the conflicting needs for a large enough sample of countries on the one hand and a sufficient number of variables on the other. Moreover, we were unable to obtain data for the same year for all the countries, therefore some data is collected from one or two years before 1981, the year on which most of the data is based.

This last problem is probably of little importance for the overall findings of the study, but it means that the selection procedure for countries is based on the availability of data, which could mean a systematic exclusion of the least developed countries, as there is probably a high correlation between a country's level of development and the availability of statistics.

The countries. 59 countries were studied and divided into two groups: 18 developed countries and 41 LDCs. The latter have been divided further for analysis into three continental sub-groups: Africa, Asia and Latin America (see the GLOSSARY for the list of the countries).

The variables. 25 variables were used. Of these, 8 concern the country's socio-economic structure while the other 17 describe various aspects of public expenditure. (see the GLOSSARY for the list of the variables).

We have performed the data-processing on three separate levels. The first, a purely descriptive level, analyses the average values of the variables used. A

second level is the effort to develop a number of fundamental correlations among public spending and socio-economic variables. The third level, employing factor analysis, provides a comprehensive analysis of the phenomenon of public expenditure.

2.2 *Average values*

The average values of all the variables used are given in Table 1.

2.2.1 The socio-economic variables.

A group of socio-economic variables has been used to represent the degree of economic development of the countries surveyed, with particular stress on highlighting the differences between the group of developed countries and that of Third World countries.

The only one of these variables in which the gap is "in favor" of the LDCs is average growth rate of GDP. The explanation of this may lie partly in the fact that the starting level of GDP is so much lower in the LDCs, partly as a purely statistical phenomenon as an index of an increasing share in the overall economy of statistically observable market economies. We shall return to this issue further on, to discuss what we consider the improper use of this variable.

All the other variables without exception are better for the developed countries, thus confirming the ability of these variables to offer a reliable indication of the social and economic differentiation between developed and less developed countries.

Table 1 - Means of all variables

		COUNTRIES				
	All	*Devel.*	*LDCs*	*Africa*	*Asia*	*L.Ame.*
1) Socio-economic variables.						
G.D.P. per capita ($)[PPG]	4.1	9.8	1.6	.6	2.7	1.6
% of population of working age (15-64 years) [WAP]	57.5	65.0	54.3	51.8	56.3	54.9
% of urban population[URP]	53.1	72.3	44.6	31.4	43.5	57.9
% agriculture on G.D.P[PAP]	16.5	5.6	21.3	28.5	20.3	15.5
Annual rate of growth of GDP Total [PRG]	4.6	3.5	5.2	4.7	6.0	5.0
Per capita [PPG]	2.5	2.8	2.4	1.7	3.4	2.4
Life expectancy [LEX]	64.3	74.4	59.9	51.6	63.2	64.9
Annual rate of increase of population [POG]	2.1	.6	2.8	2.9	2.6	2.7
2) Public expenditure variables.						
Total disbursement per capita [DPC]	1.3	3.5	.3	.2	.7	.3
Total disbursement on GDP [DIP]	27.8	35.2	24.3	28.9	24.7	19.8
Total receipts on GDP [REP]	25.6	32.0	22.8	24.2	27.5	17.7
Current disbursement on GDP [CDP]	22.4	32.1	18.1	21.2	17.4	15.8
Current receipts on GDP [CRE]	25.0	31.6	22.1	22.6	27.2	17.6
Gross capital formation on GDP [CFP]	3.7	1.3	4.8	6.7	5.2	2.6
3) Total disbursement composition.						
a) Economic composition						
Final Consumption [FIC]	41.8	27.1	48.2	52.6	43.7	47.6
Subsidies and other transfer [SUB]	32.0	57.8	20.6	14.7	17.5	25.1
Gross capital formation [GCF]	13.7	3.8	18.0	21.9	19.6	13.1
Interest on public debt[IPC]	7.3	6.8	7.5	7.1	7.7	7.6
b) Functional composition						
General public services[GPS]	15.7	9.5	18.5	24.2	17.5	13.8
Defense [DEF]	13.6	9.9	15.2	13.9	22.6	10.5
Education [EDU]	14.6	10.9	16.2	16.7	13.8	17.5
Health [HEA]	7.4	10.4	6.1	5.9	4.6	7.5
Social security and welfare [SSW]	19.2	39.0	10.5	4.9	6.3	18.9
Housing and Community Affairs [HCA]	4.7	3.8	4.8	5.6	5.1	4.3
Economic affairs [ECA]	24.7	16.1	28.5	28.5	30.1	27.2

2.2.2 The public expenditure variables

i) Total public expenditure

A first, general observation, is that the role of the state; whether measured by per capita public expenditure or by public expenditure as a share of GDP, is greater on average in the 18 developed countries. The data on per capita public spending in dollars reflects perfectly the standing of the four groups of countries on the basis of per capita GDP. However, if public spending is measured as a share of GDP, in the continental sub-division of the LDCs Africa is in first place, followed by Asia and Latin America.

The ratio of the government deficit to GDP, computed as the difference between the shares of GDP accounted for by state revenue and by state expenditure, is on the average higher in the developed countries.

ii) Composition of expenditure

We have examined two groups of variables that describe the composition of public expenditure. The first group furnishes an economic sub-division, the second a description of the functional structure of public spending.

In relation to the breakdown by economic destination, the only item whose relative share is higher in the developed countries is "Subsidies and other transfer". The weight of this item (about 58% of total public expenditure) in those countries is so great that all of the other items account for a smaller share than in the LDCs, except for interest payments, which is of the same order of magnitude in the two groups of countries.

Analysis of the data on the functional makeup of public expenditure yields similar indications. The largest share of spending in the developed countries is accounted for by "Health" and "Social Security and Welfare", which is of course the sphere in which the subsidies certainly predominate.

2.2.3 Initial indications

This brief survey of the average values of our selected variables demonstrates amply that public spending and its composition differ structurally between developed countries and LDCs. This is true both if the LDCs are taken as a single group and if they are sub-divided by continent. At this level of analysis using only average value it is impossible to derive any reliable indications about the functional relations between the variables surveyed. Thus a more thorough going analysis is called for of the relationship between public expenditure and socio-economic variables.

2.3 *The functional relations*

What follows is a series of trial estimations, by means of a cross-section analysis, of the functional relationships between public spending variables and socio-economic variables.

2.3.1 Per capita public expenditure

The first public spending variable analysed is public expenditure per capita.

The economic variable with the best positive correlation with public disbursement per capita (DPC), of course, is per capita GDP.

Analyzing the relation between public expenditure and GDP per capita, we calculated indices of elasticity via logarithmic analysis (the results are in Table 2). Note that the correlation is significantly better when only the LDCs are analysed, while the relation is considerably less significant for developed countries.

The values obtained are all higher than 1, confirming the tendency, known as "Wagner's Law", for public spending to rise more than proportionally with respect to GDP. Naturally the elasticity value is lower for the industrial countries, because those countries have already reached a high ratio of public spending on GDP (9).

Table 2 - Elasticity between DPC and PPC

All countries	1.12	AR2 = .94
Developed	1.02	AR2 = .67
LDCs	1.14	AR2 = .85
Africa	1.20	AR2 = .81
Asia	1.08	AR2 = .91
L. America	1.16	AR2 = .81

(the t-value proved always significant)

Thus per capita GDP broadly explains the level of public expenditure per capita, and the addition of other variables does not appreciably improve this functional relation (10). Still, it is of some interest to examine the correlation between per capita public expenditure and the other socio-economic variables. The indices of correlation are in the Table 3.

Table 3 - Correlation between DPC and socio-economic variables

	All	*Deve.*	*LDCs*
PPC	.93	.76	.98
WAP	.63	-.03	.05
URP	.60	.27	.48
PAP	-.63	-.60	-.44
PRG	-.33	-.50	-.13
PPG	-.08	-.28	-.27
LEX	.64	.35	.34
POG	-.52	-.62	.50

For the entire group of countries considered, the correlation coefficients show a direct relation with the level of economic development. The only exception is the negative correlation between the rate of GDP growth, total and per capita, and per capita public spending,

to which we shall return.

When the countries are disaggregate into developed and less developed, the data still tend to confirm the positive correlation between public expenditure per capita and level of socio-economic development. The sole exception is the positive correlation between population growth and public spending in the LDCs, and this is due to the fact that for LDCs as a group there is a positive correlation between per capita GDP and population growth.

Another noteworthy fact is that this disaggregation makes the correlation between per capita public spending and agriculture's share in GDP insignificant. This phenomenon - the loss of significance of a correlation between two variables when developed countries and LDCs are examined separately - recurs frequently. This is not surprising, however, since the very act of establishing groups of countries implies postulating systematic or structural conditions of membership in one group or the other, so that the sample is not a mere continuum broken down into classes with respect to the amplitude of one or several variables.

2.3.2 Ratio of public expenditure to GDP

The most commonly used variable in international comparisons of public spending is the ratio of public expenditure to GDP, this variable being the best indicator of the dimensions of state's role in resource management and in the direction of the country more generally.

We give in Table 4 the results of the correlations coefficients between public expenditure on GDP (DIP) and the other socio-economic variables:

Table 4 - Correlation between DIP and socio-economic variables

	Countries		
	All	*Deve.*	*LDCs*
PPC	.37	.12	.04
WAP	.30	-.34	-.05
URP	.22	-.13	.03
PAP	-.41	-.14	-.24
PRG	-.26	-.34	-.14
PPG	-.11	-.14	-.17
LEX	.27	-.03	-.06
POG	-.36	-.45	.04

It is immediately apparent that although for the entire sample the relations derived confirm those found previously in the analysis of per capita spending (though at lower levels of significance), when the two groups of countries are examined separately not only does the degree of correlation decline significantly, but even the sign of correlation is erratic and hard to explain.

To better define the relations between the socio-economic variables and the public expenditure/GDP ratio, we have performed a multiple regression estimation using spending/GDP (DIP) as the dependent variable and all the socio-economic variables as independent variables.

Determining a reliable functional relation between the spending/GDP ratio and the socio-economic variables proved extremely complex, however, and we were unable to obtain satisfactory results (11).

2.3.3 Growth rate and public expenditure

The most common approach in the recent literature on public expenditure in the LDCs is the effort to determine the influence of public spending on economic development. The conclusions reached by the majority

of these studies may be summarized in this statement: "The results unambiguously demonstrated that as the intensity of governmental intervention in the economy increases, the rate of economic growth deteriorates, other things equal, and the country tends to experience declining income." (R.D. Singh, 1985:223).

Actually, given that in most of these studies the basic theoretical approach, not always stated explicitly, views public spending as a diversion of available resources from investment and hence from growth, such a conclusion should come as no surprise.

In part 1 we criticized this approach from the theoretical standpoint. What interests us now is an examination of the empirical testing done by the exponents of this approach. The basis of the empirical test is the estimation of the relationship between growth rate and the ratio of public expenditure to GDP. The results of these estimations, performed via cross-section regressions, unanimously yield a negative correlation between the two variables. The conclusion drawn is that the greater weight of public expenditure *causes* a slower growth of the country's GDP. None of the works we have examined raise even the slightest doubt about the cause and effect relationship, nor do any consider the possible existence of a third variable or group of variables that condition the correlation between public expenditure and economic growth rate.

In reality, the data analysed in the present paper indicates clearly enough that the negative correlation between the growth rate and the ratio of public expenditure to GDP can be clearly explained by the fact that growth rates are lower in the more developed countries, where as a rule public expenditure accounts for a larger share of GDP. In fact there is a positive correlation between per capita GDP and ratio of public expenditure to GDP, both when the entire sample of 59 countries is studied and when the sample is sub-divided into more homogeneous groups (In the latter case there is a decline in the significance of the relationship for the LDCs, though the correlation remains positive and the negative correlation between public spending and

economic growth is weaker, see Table 4).

Moreover, the cause and effect relationship could also be reversed. It could well be argued, for instance, that the high rate of growth itself keeps the share of public expenditure "artificially" low, at least for an initial period, both in statistical terms, in that there is a rapid increase in the denominator, and in real terms, in that there is less need for government intervention in the economy.

As showed in Part 1, it could also be argued that the higher rate of growth in LDCs is explained by their high rate of public investments on GDP (4.8 against 1.3, see Table 1).

In conclusion, in our view, it can be maintained that there is no reliable empirical evidence of a negative cause and effect relationship between the weight of public expenditure and the rate of economic growth, and that any such interpretation based solely on the negative correlation between the two variables is a nonsense correlation.

2.3.4 Comment

The data examined indicates, although perhaps not unequivocally, a direct relationship between the public spending/GDP ratio and the country's level of development when all 59 countries are analysed together. However, when the developed and less developed countries are examined separately, this relationship largely disappears.

One reason for the difficulty of finding a reliable relationship could be the inadequacy of the economic variables used, which may not faithfully represent the level of economic development. Or rather, more precisely, while these variables are sufficient to indicate different levels of development in a heterogeneous group comprising of both developed countries and LDCs, they may be incapable of indicating differing degrees of development within more homogeneous groupings.

In addition, there is a second possible reason. As noted earlier, the ratio of public expenditure to GDP

is determined only in part by structural, objective factors. In many cases political and historical factors may prove decisive.

In our view, however, the chief problem with this particular relationship is that the ratio of public expenditure to GDP only partially reflects the real weight of public intervention. No less important is the data on the composition of public expenditure, from which one may derive a fuller picture of the linkages between economic structure and public spending.

We shall therefore try to explain some of the differences between the economic variables by an analysis of the makeup of public expenditure, which is to say, the way in which that expenditure is utilized.

2.3.5 Composition of public expenditure

We shall conduct an initial examination of the functional relations that can identify "regularities" in the structure of public expenditure by means of a table correlating the relative weight of public spending (both per capita and as a ratio to GDP) with the composition of the expenditure (Table 5).

First, let us look at the values for all countries surveyed. The only two spending components that correlate positively with the level of expenditure are health spending (HEA) and welfare spending (SSW) [expenditure for housing (HCA) also has a positive correlation, but the coefficient is very low and not significant]. All other item have a negative correlation. In particular spending on Gross capital formation (GCF) and Economic affairs (ECA) have a very high negative correlation.

In general, this can be explained by the fact that generically welfare-related spending is the type of expenditure least bound up with the "minimum" functioning of the state apparatus, so that such spending can only begin to assume substantial proportions once public expenditure as a whole has reached rather high levels.

This conclusion is moderated when the data are analysed separately for developed and less developed coun-

Table 5 - Correlation table

	All	*Devel.*	*LDCs*	*Africa*	*Asia*	*Lati.Am.*
DPC-DIP	0.57	0.73	0.34	0.61	0.49	0.47
DPC- GPS	-0.33	0.03	-0.25	-0.09	-0.09	-0.33
DPC-DEF	-0.29	-0.37	-0.04	-0.13	0.15	-0.41
DPC-EDU	-0.31	-0.03	0.09	0.33	0.24	-0.15
DPC-HEA	0.32	-0.10	0.10	-0.14	0.42	-0.17
DPC-SSW	0.62	0.35	0.35	0.14	0.04	0.50
DPC-HCA	0.01	-0.004	0.02	0.29	0.11	-0.09
DPC-ECA	-0.52	-0.25	-0.31	-0.10	-0.46	-0.35
DPC-GCF	-0.44	-0.41	-0.14	0.09	0.05	-0.40
DIP-GPS	-0.08	0.02	0.20	-0.005	0.07	-0.09
DIP-DEF	-0.25	-0.30	-0.11	0.06	-0.34	-0.35
DIP-EDU	-0.14	-0.005	0.03	0.19	-0.005	0.02
DIP-HEA	0.19	0.02	-0.04	-0.17	0.26	0.03
DIP-SSW	0.35	0.23	-0.01	-0.04	0.68	-0.07
DIP-HCA	0.03	-0.09	0.14	0.31	-0.49	0.34
DIP-ECA	-0.35	-0.18	-0.11	-0.22	-0.33	0.18
DIP-GCF	-0.16	-0.09	0.18	-0.09	0.33	-0.22

tries, especially when public expenditure is measured as a share of GDP.

For the developed countries, it is worth noting that the correlation between the share of welfare spending in overall expenditure and the ratio of expenditure to GDP remains significantly positive. And considering that the average weight of welfare spending is 39%, this suggests that the variability in the ratio of public expenditure to GDP in the developed countries is itself principally due to welfare spending.

For the LDCs, while the correlation between the structure of public spending and the amount of spending per capita is confirmed, there does not appear to be any significant regularities when expenditure is measured not per capita but as a percentage of GDP.

As partial conclusion it is possible to observe that there is no reason to hold that a higher share of public expenditure on GDP engenders a lower rate of growth, on the contrary, there could be some reasons in favour of a direct relationship between the *level* of development and the weight of public expenditure.

2.5 *Factor analysis* (12)

The correlation between the variables relating to socio-economic structure with those relating to public expenditure did not yield any clear link between economic structure and the size of state intervention, especially when the latter is expressed as the share of GDP accounted for by public expenditure.

A useful statistical tool to more fully comprehend the relationship between the socio-economic structure and the overall structure of public expenditure is factor analysis. By means of the principal components system of factor analysis, we are able to carry the analysis of the relations between economic development variables and public spending variables further.

Specifically, two indicators can be used to summarize respectively the chief aspects described by the group

of socio-economic variables and the group of public spending variables. These indicators are determined by using each country's coordinates on the first axis, i.e. the one which gives the highest degree of explanation of the total inertia.

Using a single coordinate means that only part of the total phenomenon (total inertia) is reflected, and this is a limitation but at the same time a useful simplification for the purposes of analysis. Very probably the two groups of variables reflect highly complex, diverse phenomenon and causal relationships, depending to a large extent on factors that are difficult to analyse in quantitative terms. The advantage of using the coordinate on a principal axis is that it isolates the chief characteristics of the two phenomena and thereby simplifies the search for a relation between them.

2.5.1 The socio-economic variables

Factor analysis of the socio-economic variables for all 59 countries enabled us to identify coordinates on the first axis capable of explaining 55% of the total inertia.

Analysis of the position of the variables on the correlation circle showed that the first axis represents the sample countries' degree of social and economic development better than the single variable of per capita GDP (13).

2.5.2 Public expenditure variables

At the same time we performed a similar analysis using the group of 16 variables relating to public expenditure (14). In this analysis too we have used the coordinates on the first factor axis of the 59 sample countries as an index of the structure of public spending. The explanatory capacity of the first axis is 35% and represents the combined effects of the composition variables and those relative to the share of GDP.

The coordinates on the first axis can be read as an indication of the "degree of maturity" of public ex-

penditure, defined both as a relatively large share of GDP and as a high share of welfare-related items (15).

2.5.3 The comparison

Fig. 1 gives the positions of the sample countries according to the values of the two indices.

The comparison between the two indicators was done in two ways: by means of non-parametric statistics and by means of simple regression analysis.

i) Non-parametric analysis. This entailed first creating and than comparing the ranking of the countries on the basis of the two indices. Kendall's TAU coefficient was very high (.92), showing a high and significant correlation between the two rankings. In order to identify the situation marked by the greatest variability, we also developed a ranking of the countries according to the magnitude of the difference between their ranks in the economic and in the public spending ranking. The results are given in Table 6.

ii) Regression analysis. Estimating the linear regression linking the two indicators, we obtained the following results:

(The dependent variable is Public expenditure coordinates)

Countries	Constant	Socio-econ. coord.	R2A
All	-.0002	.97	.73
	(....)	(12.7)	
Devel.	.64	.88	.13
	(.51)	(1.9)	
LDCs	-.56	.63	.42
	(-2.6)	(5.4)	

The values of the residuals of the regression tended to be positive for the developed countries and negative for the LDCs. We therefore re-estimated the relationship

Table 6 - Rank difference between development and public expenditure

Devel.		*Africa*		*Asia*		*Latin Amer.*	
ITA	-13	MAU	-23	SRL	-27	BRA	-10
POR	-7	EGY	-17	JOR	-5	NIC	-5
AUS	-5	KEN	-14	IND	-5	ELS	-2
FRA	-5	ICO	-9	PAK	-3	COS	-1
NOR	-5	GHA	-8	KUW	-1	CIL	0
SPA	-5	ZAM	-7	MAA	0	URU	2
NEL	-4	TUN	-6	TUR	5	JAM	3
BEL	-1	MOR	-4	TAI	6	MEX	3
ALI	0	ZAI	-4	KOR	7	PAR	3
FIN	1	ETH	-2	INO	8	ARG	4
SWE	2	MAL	-1	PHI	22	HON	4
GRE	2	NIG	1	SIN	26	VEN	7
DEN	3	CAM	8			BOL	8
CAN	5	LIB	14			DOR	8
USA	5					PER	8
GER	6						
UKM	6						
JAP	22						

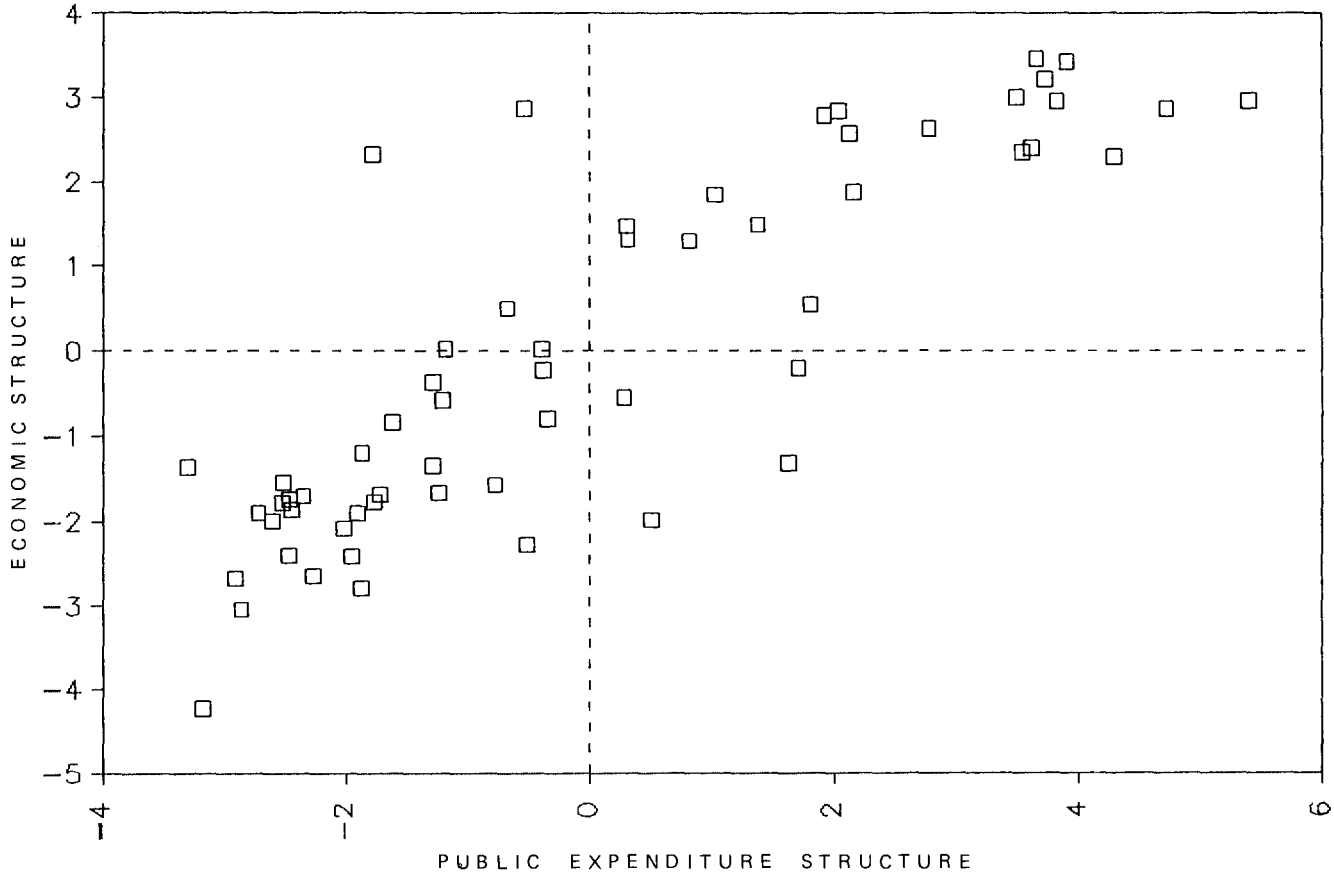
inserting a dummy variable whose value is -1 for the 18 developed countries and 0 for the LDCs.

The results are as follows:

Dependent variables is Public expenditure coordinates (All countries)

Constant	Socio-econ. coord.	Dummy	R2A
-.53	.66	-1.75	.77
(-2.35)	(5.43)	(-3.14)	

Fig. 1 - Countries position



2.5.4 Comment

The results obtained by factor analysis appear to indicate clearly enough that there is a quite strong correlation between the level of economic development and the structure of public expenditure. More precisely, the structure of public spending is significantly correlated with several socio-economic indicators capable of distinguishing structural difference between sharply differentiated groups of countries. When more homogeneous groups of countries are analysed, in fact, the correlation weakens or disappears, either because the socio-economic variables utilized are not capable of indicating the difference between more homogeneous countries, or else because they are incapable of identifying those differences that are decisive for the structure of public expenditure (16).

In conclusion, when developed countries and LDCs are considered together, the insertion of variables relating to the composition of public expenditure definitively establishes what had remained unclear when the analysis was restricted to the correlation between the level of development and the share of public spending in GDP. Namely, that those socio-economic variables which effectively mark the structural differences between developed and less developed countries can also explain the differences in weight and structure of public expenditure between the two groups.

Obviously, there is a certain unexplained variability, but this appears to be due more to particular situations in individual countries than to systematic factors (17).

Table 7, giving the position of the countries according to their factor coordinates and according the regression line, would appear to demonstrate undeniably that each country's "deviation" from the general direct relationship between the level of economic development and the structure of public expenditure has a specific explanation in the country's history and particularities.

Table 7 - Countries position

Development		
+	JAM JAP KOR SIN VEN	ALI CHI GRE POR USA ARG DEN ITA UKM AUS FIN KUW SPA BEL FRA NOR SVE CAN GER NEL URU
-	BOL ETH INO MAU PAK TUN CAM GHA KEN MEX PAR TUR COS HON LIB MOR PER ZAI DOR ICO MAA NIC PHI ZAM ELS IND MAL NIG THA	BRA EGY JOR SRL
	- Public expenditure +	

In our view, this does not create problems for our analysis. On the contrary, we can state that *despite* the enormous variability of specific situations there is a meaningful "regularity" in the behavior of state intervention reflected in public expenditure.

The essence of this "regularity" is that in comparisons between developed countries and LDCs, the structure of public expenditure and its share of GDP should not be considered as independent variables but as interacting, contributory factors in the definition of underdevelopment itself.

Part 3 - Conclusions

Of late, established economic theory, both academically and politically, sees the growth of public spending as a danger, indeed as the chief danger, for economic growth.

We have seen that this sort of univocal interpretation of the relationship between public spending and economic growth is not justified on theoretical grounds.

Considering further, that most of the theoretical studies of the effects of public expenditure refer to conditions in developed countries, it is all the more improper to single out public expenditure as the source for many of the ills of the LDCs. We have shown clearly that it is not possible, even empirically, to specify a cause and effect relationship in the negative correlation between the ratio of public expenditure to GNP and the rate of economic growth - a correlation moreover whose level of statistical significance is very low.

What we feel are our most significant findings relate to the effort to find a relationship between *the level of economic development* i.e., *socio-economic structure* and *the weight and structure of public expenditure* by correlating an indicator of the level of development with an indicator of the structure of public spending.

The measurement of the level of economic development by single indicators should not be interpreted as implying that development is continuous, linear and chronological. The use of the indicator was intended only to rank each country with respect to the others, and in no way is meant to imply a possible or predetermined historical process whereby countries can move up the "ranks". On the contrary, the results of our analysis demonstrate that this measure is valid only in comparisons between developed countries and LDCs groups, losing much of its significance in transnational comparisons within more homogeneous grouping. This strongly suggests that while this indicator is able to differentiate developed countries from LDCs, it does not contribute to our understanding of the processes or pathways of development.

Within these limits, our findings enable us to affirm, with a good degree of certainty, that there is a highly significant relation between the level of economic development and the structure of public expenditure. Specifically, the higher a country's rank in the level of economic development, the greater the ratio of public expenditure to GNP and the more "mature" the composition of expenditure (i.e., the higher the share of public expenditure for subsidies and welfare).

It is not possible to trace a cause and effect relationship between public spending and economic structure. Self-evident though it is that the socio-economic structure tends to influence the structure of public spending, there is very probably also feedback, i.e. an impact of public spending on the socio-economic structure. What can be said is that public expenditure is best considered a supplementary variable, interacting with socio-economic variables in defining a country's level of development.

Despite its theoretical and empirical significance, however, the relationship between economic structure and the structure of public expenditure should not be interpreted in an over-deterministic fashion, essentially for two reasons. First there is a degree of variability, quite considerable in some cases, with respect to the linear regression representing the relationship between the level of development and public spending. And second, the cause and effect relationship between the level of development and public spending is not one-way; in some cases both theoretical and empirical considerations indicate the presence of a reverse causal nexus.

There is thus some degree of freedom, expressed partly in differing economic policy approaches, which allows public spending to play differing roles in structurally similar situations. There is still a significant need, therefore, for the specific analysis of the role and structure of public spending in individual countries or homogeneous groups of countries.

In conclusion, we observe that economic studies can generally be divided into two groups, those whose intent is to establish general laws and those aiming to analyse the specifics. The present study sees the search for a general relationship as the prerequisite and foundation for the analysis of specific situations and circumstances.

Footnotes

An earlier draft of the paper was presented at the Symposium "The Contemporary State: At the Core of Society?", Department of Sociology University of Montreal, Canada, June 1986.
We would like to thank all the participants to the Symposium for their helpful comments and suggestions. Needless to say that we take full responsibility for any possible mistakes.
The paper, of course, is the result of work written in collaboration by the two authors. However, the final draft has been written separately: C. Sardoni has written the first part, and P. Palazzi is the author of the second part.

1. For more details on empirical research, see Part 2.

2. Although Ricardo, for instance, holds that additional unemployment can be generated by the technical progress embodied in new investment. Cf. Ricardo 1951, pp. 386-97.

3. Cf., e.g., Smith 1976, pp. 244-309, vol. II.

4. It could even be increased if such expenditures engender gains in the productivity of labour larger than those determined by private productive expenditure.

5. For the original Domar model, cf. Domar 1946.

6. This assumption could be easily removed allowing for public deficits or surpluses. This, however, would need to take into consideration the long period effects of an imbalance in the public budget; in order to avoid these unnecessary complications we assume here a balanced budget. In fact this assumption does not affect our results in any significant way.

7. Also this assumption can be removed quite easily, allowing for different ρ'_s in the public and private sectors. In such a case, ρ in Equation 1 is a weighted average of two different ρ'_s in in the public and private sectors.

8. Let $g'' = \rho\ [s(1-t')+t'(1-a)]$ and $g' = \rho\ [s(1-t)+t(1-a)]$, with $t'>t$. It is easy to see that $g''>g'$ if and only if $(t-t')(s+a-1)>0$. $(t-t')$ is negative by assumption so that $(s+a-1)$ must be negative as well in order that the condition above be fulfilled. But $(s+a-1)<0$ if $a<(1-s)$, i.e. $a<c$.

9. Actually, the values derived from a cross-section analysis are subject to reservation if used as indices of elasticity. However, a large number of studies confirms that the GNP elasticity of public expenditure is higher than 1. See Thorm (1967), Gandhi

(1971), Enweze (1973).

10. The Adjusted R-squared of the multiple regression between DPC and all 8 economic variables are the follows: All countries (.88), Developed (.52), LDCs (.98), Africa (.84), Asia (.99), Latin America (.93). The t-stat are not significant for mostly all other variables with the exception of the GDP per capita.

11. Other techniques, such as forward and backward stepwise regressions, also failed to yeld significant relations.

12. For the sake of brevity, we shall not give the full results of our factor analysis, even though those regarding the placement of the variables in the correlation circles were of undeniable interest.

13. Actually there is a high correlation (Kendall's TAU coefficient is .94) between the rank order of the countries by per capita GNP and that yielded by our summary variable. In fact, the coordinate on the first axis partly corrects the incongruencies relating to the position of some oil producers. The second axis is heavily influenced by GDP growth rate. Together the first two axes explain about 80% of total inertia.

14. In this analysis we have excluded the variable Per capita public expenditure, because its high correlation with Per capita GNP would have limited the results yielded by the analysis.

15. The second axis contributes 18% to the explanation of total inertia, and its interpretation proved more uncertain.

16. When the developed and less developed countries are treated separately, not even factor analysis yields significant relations between the public spending and socio-economic indices.

17. One possible systematic factor could well be the type of political power however the level of our analysis does not allow us to test this hypothesis.

GLOSSARY

Countries

Developed

1	AUS	=	Austria
2	BEL	=	Belgium
3	DEN	=	Denmark
4	FIN	=	Finland
5	FRA	=	France
6	GER	=	Germany, F.R.
7	ITA	=	Italy
8	NOR	=	Norway
9	NEL	=	Netherlands
10	POR	=	Portugal
11	UKM	=	United Kingdom
12	SWE	=	Sweden
13	GRE	=	Greece
14	SPA	=	Spain
15	CAN	=	Canada
16	USA	=	United States of America
17	ALI	=	Australia
18	JAP	=	Japan

LDCs

19	EGY	=	Egypt
20	ETH	=	Ethiopia
21	GHA	=	Ghana
22	ICO	=	Ivory Coast
23	KEN	=	Kenya
24	LIB	=	Liberia
25	MAL	=	Malawi AFRICA
26	MAU	=	Mauritania
27	MOR	=	Morocco
28	NIG	=	Nigeria
29	TUN	=	Tunisia
30	CAM	=	Cameroon, R.U.
31	ZAI	=	Zaire
32	ZAM	=	Zambia
33	JOR	=	Joardan
34	KUW	=	Kuwait
35	TUR	=	Turkey

36	IND	=	India	
37	INO	=	Indonesia	
38	KOR	=	Korea, R.	
39	MAA	=	Malaysia	ASIA
40	PAK	=	Pakistan	
41	PHI	=	Philippines	
42	SIN	=	Singapore	
43	SRL	=	Sri Lanka	
44	THA	=	Thailand	
45	ARG	=	Argentina	
46	BOL	=	Bolivia	
47	BRA	=	Brazil	
48	CHI	=	Chile	
49	COS	=	Costa Rica	
50	DOR	=	Dominican Republic	
51	ELS	=	El Salvador	LATIN AMERICA
52	HON	=	Honduras	
53	JAM	=	Jamaica	
54	MEX	=	Mexico	
55	NIC	=	Nicaragua	
56	PAR	=	Paraguay	
57	PER	=	Peru	
58	URU	=	Uruguay	
59	VEN	=	Venezuela	

Variables

1) Socio-economic variables

PPC = G.D.P. per capita ($)
WAP = % of population of working age (15-64 years)
URP = % of urban population
PA = % agriculture on G.D.P.
PRG = Annual rate of growth of GDP
PPG = Annual rate of growth of GDP per capita
LEX = Life expectancy at birth
POG = Annual rate of increase of population

2) Public expenditure variables

DPC = Total disbursement per capita
DIP = Total disbursement on GDP

REP = Total receipts on GDP
CDP = Current disbursement on GDP
CRE = Current receipts on GDP
CFP = Gross capital formation on GDP

3) Total disbursement composition (% of Total disbursement)

a) Economic composition

FIC = Final Consumption
SUB = Subsidies and other transfer
GCF = Gross capital formation
IPC = Interest on public debt

b) Functional composition

GPS = General Public Services
DEF = Defense
EDU = Education
HEA = Health
SSW = Social Security and Welfare
HCA = Housing and Community Affairs
ECA = Economic Affairs

DATA SOURCES

a) Public Expenditure variables:
Current Receipts, Current Disbursement, Gross Accumulation, Total Receipts, Total Disbursement, Final Consumption, Interest on Public Debt, Subsidies and Other Current Transfers, Gross Capital Formation, General Public Services, Defense, Education, Health, Social security and Welfare, Housing and Community Affairs, Economic Affairs.

b) Economic and Social variables:
Annual Rate of Increase of Population (1975-1980), Gross Domestic Product in Purchasers' value (National Currency Units), Average Annual Rate of Growth of GDP at

cy Units), Average Annual Rate of Growth of GDP at Constant Prices (1970-1979) Total and per-capital , Percentage Agriculture on GDP.

- U.N., *Statistical Yearbook*, United Nations, New York 1983. The data related to the public expenditure variables is an integration of independently compiled government statistics in the U.N. System of National Account. In this first phase of the conversion program the data covers only the activity of the Central government. For this reason the data about public expenditure is an underestimation for the countries where the local government has a large importance institutionally.

  Growth Domestic Product per-capita (Dollars 1980), Percentage of Population of Working Age (15-64 years) (1980), Percentage of Labor Force in Agriculture (1980), Urban Population as Percentage of Total population (1980), Life expectancy at birth (1982).

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Summary

The paper analyses the relationship between economic structure and public expenditure in 59 countries. The countries considered are both developed and underdeveloped. The focus is on the relation between growth and the structure of public expenditure from the theoretical and empirical points of view.

The theoretical approach is based on a post-Keynesian model, the empirical analysis is carried out by using regression and factor analysis.

The main theoretical findings are that the there are no theoretical grounds to hold unambiguously that a higher share of public expenditure causes a lower rate of economic growth.

The empirical analysis shows that there exists a direct relationship between the level of development and the structure of public spending, and the inverse correlation between growth and the share of public expenditure cannot be interpreted as a cause-effect relation.