

THE EFFECT OF CENTRAL GRANTS ON LOCAL AUTHORITIES' EXPENDITURES IN SOUTH KOREA.

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Introduction

In South Korea, since the 1970s the demand for services provided by local government has rapidly increased because of urbanisation and rising income. The growth of local revenues, however, has not been stimulated to the same degree, and has continued to lag behind. Also, there have been problems of financial capacity among the regions. Central government pre-empts taxes on important revenue sources, it has power to determine the tax rate of local governments and there are big financial gaps among regions, so it is inevitable that local authorities became highly dependent on the central government and that some will be more dependent than others (Ahn, 1995).¹⁾

For the above reasons, this paper attempts to examine the fiscal relations between central government and local government over the period 1975 - 1995 in South Korea. That is empirically to investigate the following research question. "What effects do central grants have on local authority expenditure?" In other words it seeks to examine the impact of central grant on local government total as well as the functional expenditure. In this respect

¹⁾ During the past two decades in South Korea, percentage of central grants to local general revenue was 1975 (54.4%), 1980 (45.7%), 1985 (41.8%), 1990 (45.5%), and 1995 (33%) (Ministry of Home Affairs, 1976, 1981, 1986, 1991, 1996).

we test Boyne's (1990) theory regarding the stimulation, no stimulation, partial substitution, and complete substitution of the main two types of grant (i.e. local share tax and subsidy) in South Korea.

This paper is organised into six sections. Following the introduction section two outlines the theoretical background and formulates hypotheses for central grant effects. Section three presents research methodologies. Section four, analyses the total expenditure of all local authorities. Then, in section five, we present the empirical results of four specific functional expenditure for local authorities - those for general administration, social welfare, industry and economy, and for regional development. Section six summarises the findings, drawing together a number of more general observations.

Theoretical Background and Formulation of Hypotheses

Historically, many theories have been developed to explain the effects of intergovernmental grants on local government spending. The most common theory is the economic approach. In this section some basic microeconomic theory is applied in order to analysis different types of grants (Haskell 1964; Wilde 1971; King 1984). In this analysis indifference curves are used to examine the impact of intergovernmental grants on recipient local authority spending. Using this approach the receipt government is considered as utility maximising consumers with preferences for public spending given by a social welfare function and constrained by the financial resources available (i.e. own income + grant) (Schwallie, 1989).

Subject to these constraints local authorities should maximise the social utility of the people, which is the typical maximisation of social welfare. Following this approach the social welfare would be maximised in line with the preference given by the government's utility function. In this case it is assumed that the effect of changes in income and relative prices are similar to that of individual consumer.

There are many advantages for the economic approach. First, it is useful in

assuming that fiscal decision makers weigh trade-offs among the various public and private goods, and that the decision process is influenced by income and price effects. Second, it represents a relatively uncomplicated model that is especially amenable to empirical analysis. A third, possible advantage is that, since the objective function being maximised is a social welfare function, it is possible to analyse the normative effects of grants, and to predict changes in the fiscal behaviour of local authorities from receipt of the grant (Schwallie, 1989).²⁾

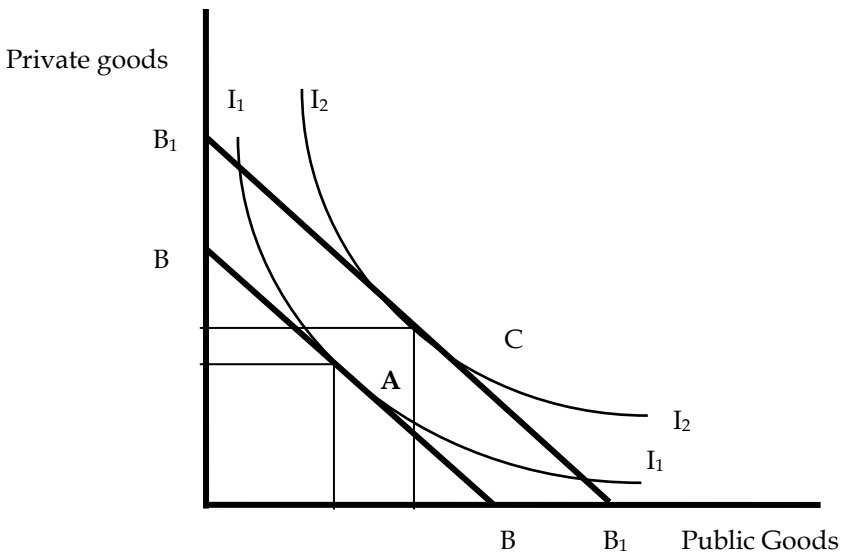
The effects of intergovernmental grants differ from one type to another; in what follows we investigate their effects. First, lump-sum, unconditional grants³⁾, are shown in figure 1. Here public goods are drawn on the horizontal axis and private goods on vertical axis. BB represents the budget constraint, which equal the financial resources available to the community. The indifference curve I_1I_1 is a measurement of the social welfare as determined

²⁾ King (1984, pp.89-90) has enumerated a number of assumptions made in a typical indifference curve analysis: Community indifference curves are assumed to be convex; it is assumed that no corner solutions occur along the axes; it is assumed that the prices of all grantees functions are unaffected by the guaranties purchased; grantees are assumed to be unable to export any part of their taxes, so that increases in their taxes must be wholly financed by their own citizens; grantees are assumed to provide goods and services alone, and not subsidies or transfer payments, so that an increase in their taxes necessarily reduces the funds available for their citizens to spend on private goods and services; the reactions to grant changes by any one authority are assumed to have no external effects on others, so that, in turn, no feedback problems arise; and it is assumed that the introduction of any grant, whether specific or general, has no demonstration effect that would alter tastes in the direction of a particular grantee function or grantee functions in general.

³⁾ General grants are not tied to any specific spending programme and can be channelled by local governments (usually with relatively minor limitations and legal constraints) to whatever programmes they judge to be of greatest local concern or importance. General revenue-sharing in the United States and Canada, the British Revenue Support Grant (RSG), local share tax in South Korea are examples of this grant category.

by government preference. The amount of public and private goods is shown as the interaction of I_1I_1 and BB . In what follows we illustrate how the unconditional grant might affect the amount purchased from private and public goods as well as the social welfare or the community utility (Gramlich, 1970, pp. 573-574).

Figure 1. Effects of Lump-Sum, unconditional grants

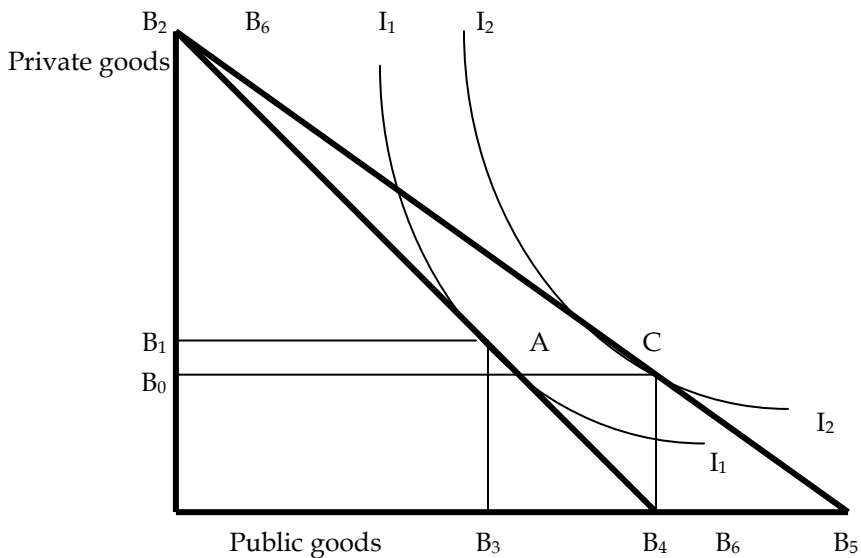


Source: based on Gramlich (1969).

In the above figure if a local authority receives a lump-sum grant of BB_1 , then it is able to purchase more public and private goods. The budget line shifts to the right B_1B_1 to reach the higher indifference curve I_2I_2 at point C. At C more of the public good is consumed, but not all the grant is used to purchase this good. Some of this grant are used to reduce tax (i.e. increase private goods). It is not necessary that the purchase of public and private goods increase by the same proportion as the increase in community resources.

Second, conditional grant⁴): unlike the unconditional grant, the matching (i.e. conditional) grants has both income and price effect. This is illustrated in figure 2. In this figure the pregrant tangency between budget line B_2B_4 and indifference curve I_1I_1 at point A represent the government preference between public and private goods. As this point B_3 is consumed from public goods and B_1 is consumed from private goods (Gramlich, 1970, p. 547).

Figure 2. Effects of conditional non-matching grant



Source: based on Gramlich (1969).

⁴) Specific grants (also termed selective or categorical grants) are tied to specific expenditure programmes, e. g. education, health, public infrastructure and so forth. They are also often very constrained even with these categories. Special revenue sharing and categorical grants in the USA, the British specific grants for police, transport, national parks and urban programme, and subsidy in South Korea are examples of this category.

The postgrant budget line is B_2B_5 , which takes the government to indifference curve I_2I_2 and point C. As shown from the figure the grant has increased the social welfare, increased public goods but has reduced private goods. The stimulative effect of this grant is shown by comparing point C to point A. (Schwallie, 1989).

This analysis suggests that matching grant (subsidies) induces more public spending than the lump-sum grant (local share tax). This is mainly because the farmer affect purchase of public goods through both income and price effects, while the latter affect them through income effect only.

In summery, Boyne suggests four possibilities for the fiscal effects of central grants on local government expenditure (Boyne, 1990, pp.210-212). First, complete substitution effect, this happens when an increase in central grants causes no effect on local government expenditure. In this case the coefficient of grants in regression equation must be zero (i. e. $b = 0$), which means grants are insignificant as an explanatory variable for local government total expenditure. This case occurs when an increase in central grants is used to cut local taxes.

Second, partial substitution effects occur when an increase in grants results in an increase in local government expenditure, but the increase is less then the full amount of the grant. In this case the coefficient of central grant in the regression equation is expected to be less then one (i. e. $1 > b > 0$). The explanation for this is that only part of the extra grant is used to cut local tax, the remainder being used to increase local government spending.

Third, no substitution effect occurs when all extra grants are allocated to local government spending, in which case the local government expenditure increases by the same amount as an increase in central grants. Under this circumstances the coefficient of central grant in regression equation is equal to one ($b = 1$).

Finally, the stimulation effect occurs if an increase in central grants results in an increase in local government expenditure which exceeds the value of central grants. In this case the coefficient of central grant in the regression equation is expected to be greater than one ($b > 1$).

Thus economic theory provides three further hypotheses on the

relationship between central grants and local spending.

- Hypotheses 1** The impact of subsidies on a local authority's expenditures is greater than that of the local share tax.
- Hypotheses 2** The impact of local share tax is partial substitution.
- Hypotheses 3** The impact of subsidy is stimulation.

The rest of this paper is devoted to testing these 3 hypotheses, using a methodology developed and described in the next section.

Research methodology

To attain the research objectives, like most studies in this field (Kurnow (1963); Sacks & Harris (1964); Osman (1966); Booms & Hu (1971); Tolley et al., 1983; Pelissero, 1985; Johnson, 1985; Hewitt, (1986); Wyckoff, 1988; Grossman, (1989); Boyne (1990), and Ahn, (1995)), we use regression analysis. In addition, we use correlation analysis to examine the influence of intergovernmental grants on local authorities' expenditure. Also, qualitative techniques, mainly interviews, were performed to support the qualitative techniques and to provide a tool of analysis for questions of unmeasurable nature. With regards to regression analysis we develop one model, being designed to test or answer one of the research questions or hypotheses as follows:

$$Y_{jt} = a_0 + a_1X_{1t} + a_2X_{2t} + \dots + a_{k-1}X_{(k-1)t} + U_{jt}, \quad j=1, 9 \text{ provinces.}$$

Where Y is the total and functional expenditure. $X_{1t}, \dots, X_{(k-1)t}$ are explanatory variables such as per capita own income, per capita local share tax, per capita subsidies, population who are 65 years or older, area size, population density, per cent of voting for congressional candidates of ruling party, number of motor vehicles, number of public officials per 1,000 population, population size, road length per person, and Per cent of

population living in urbanised area. t is selected years.

Panel data involved a pooling of cross-sectional and time series⁶⁾ data to estimate the models. For the time series we select 1975, 1980, 1985, 1990 and 1995 to represent the time path of the variables. The data covering these years and for the different variables are constructed from the currently operating provinces in South Korea. Currently, there are nine provinces (Kyonggi (KGD), Kangwon (KWD), Chungbuk (CBD), Chungnam (CND), Jeonbuk (JBD), Jeonnam (JND), Kyongbuk (KBD), Kyongnam (KND), and Jeju (JJD)) in South Korea, and all of them are included in the sampling in this study.

A log value is used because the relationship between the dependent and independent variables may be curvilinear. For example, in road construction, it is not likely that the same amount of money would be spent for the first kilometre of construction as a kilometre in a later stage, since economy of scale is likely to take place. The log transformation is done on all variables except trend and dummy variables (Freund & minton, 1979; Maddala, 1988).

Due to the inherent difficulties and the high cost of collecting primary data, we will rely on secondary data from various national and international sources, including the bank of Korea, the Ministry of Home Affairs, the Economic Planning Board, National Statistical Office Republic of Korea, and the Organisation for Economic Co-operation and development (OECD).

⁶⁾ Many scholars have emphasised the importance of time-series analysis on expenditure effects. For example, Boyne (1988) insists that considering that government expenditures have been built up over many years, the expenditure level of a specific year is an inappropriate operationalisation. Rich (1988) also emphasises the importance of the dynamic side in the study of allocation of federal government aid. Since federal grants programs have achieved such a prominent place in nearly all-domestic policy areas, understanding the dynamics of policy distribution requires an appreciation of the politics of federal programs. (Ahn, 1995)

Analysis of effect of central grants in total expenditure

Most studies in this area assert that central grants have stimulative effects on local authority expenditure.⁷⁾ The traditional theory on intergovernmental grants suggests that grants raise the level of recipient government goods and services regardless of their types. That is, central grants may positively affect local expenditures.

The purpose of this section is to examine the impact of central grants on local authority total expenditure. To do so, both correlation and regression are employed to estimate the relationship between total expenditure and certain select variables. Interviews are employed to provide a qualitative dimension to complement the quantitative approach. Two types of grant are included: local share tax; and subsidies.

Before turning to specific expenditures, it is necessary to discuss the main determinants of local authority expenditure in general as reflected in total spending.

Correlation Analysis

It is worth noting that local government total expenditure is affected by many variables, including those of a socio-economic nature.(O'Brien, 1971; Hammes and Wills, 1987; Mogull, 1990; and Kang, 1993) The main variables are: own income (local share tax + non-tax revenue) of each province (OWN); local share tax (LST); subsidies (SUB); percentage of population who are 65 years or older (AGE); area size (AREA); population density (DEN); percentage of citizens who vote for congressional candidates of the president's party (ELE); number of motor vehicles (NMV); number of public officials per 1,000 population (OFF); population size (POP); road length per

⁷⁾ The most recent detailed theoretical and empirical investigation of the link between central grant and local authorities spending in United Kingdom is that by Boyne (1990), in United State is that by Schwallie (1987), and in South Korea is that by Ahn (1995).

person (RLP); and percentage of population that is unemployed (URB). Initially correlation analysis will be used to identify which of those variables are strongly correlated with local authority expenditure. Correlation will also be used to determine the direction of the central grant on local government expenditures. The results of the correlation calculation are presented in table 2.

Table 2 shows that subsidies (SUB = .9350) have the highest correlation coefficient. Other variables which have a high correlation with total expenditure include the own revenue (local tax revenue + non- tax revenue) of each province (OWN = .9222), local share tax (LST = .8086), percentage of citizens who vote for congressional candidates of the president’s party (ELE = .3640), number of public officials per 1,000 population (OFF = .7557), population size (POP = .3464), and road length per person (RLP = .3150) significantly correlated with total expenditure. All these variables have positive correlation coefficients, which implies that the variables vary in the same direction as total expenditure.

Table 2. Correlation Analysis for Total and Four Functional Expenditures

VARIABLES	TEXP	GAE	SWE	IEE	RDE
OWN	.9222 ***	.8998 ***	.9251 ***	.7051 ***	.9548 ***
LST	.8086 ***	.8255 ***	.7904 ***	.9396 ***	.7167 ***
SUB	.9350 ***	.9284 ***	.9286 ***	.9537 ***	.8836 ***
AGE	.0264	.0400	.0262	-.0045	.0650
AREA	-.2005	-.2554 *	-.1140	-.3419 *	-.1131
DEN	-.0441	-.0380	-.0622	-.0301	-.0565
ELE	.3640 *	.3794 *	.3358 *	.2943 *	.4119 **
NMV	-.0584	-.0681	-.0543	-.0438	-.0523
OFF	.7557 ***	.7681 ***	.7772 ***	.6452 ***	.7684 ***
POP	.3464 *	.3501 *	.3582 *	.1261	.4150 **
RLP	.3150 *	.3331 *	.2733 *	.4581 **	.2384 *
URB	.1636	.1712	.1542	.1810	.1511

Note: An asterisk indicates statistically significant relationships at .05 level, two asterisks indicate at .005, and three asterisks indicate at .0001.

These results show that OWN, LST, SUB, ELE, OFF, POP, and RLP are the most significant explanatory variables for total expenditure. A more detailed analysis of these relationships is presented in the next section.

Regression Analysis

In the methodology section we developed a model to be used to estimate the impact of central grants on local government expenditure. In the previous section we estimated the correlation coefficient for the variables that were used in this section. But, as shown from the correlation test, some variables were not significant. In this section we therefore calculate the regression equations only for the more strongly correlated variables. These are OWN, LST, SUB, ELE, OFF, POP, and RLP. Besides these variables the regression equation includes dummy variables for the nine provinces and the time trend. The reason for including the dummy variables is that we want to test whether local authorities have similar expenditure patterns or not - in other words to examine the variation between different provinces. The Jeonnam province is used as a reference group. The time trend is used to test the movements of the variables over time.

The results of the regression equations are presented in table 3. They show that the variables identified explain more than 99 per cent of the variations in total expenditures. In addition the results show that among the explanatory variables, which are included in the equation only, there are significant - namely OWN = .49, LST = .19, and SUB = .24. The rest of the variables such as ELE, OFF, POP, and RLP are insignificant. The time related variable (TREND) is also not significant. Among the dummy variables for the nine provinces only two are negative and statistically significant at 0.10 level. Unexpectedly, KBD and KND show small total spending per capita than JND, a reference group. This indicates that the Kyongsang area spent the least money per capita during 1975-1995, implying that local government expenditure in South Korea varies according to variations in OWN, LST, SUB. In other words, the movements in local government total expenditure in South Korea are governed by the changes in OWN, LST, and SUB - that is the local factors of

the particular authority, the local share tax and subsidies.

Among the significant variables OWN is the most important variable that affects total expenditures. Regarding the relative strength of the two types of central grants (i.e. subsidies and local share tax) the results show that the impact of subsidies on total expenditures are greater than that of the local share tax. Specifically, while a one per cent increase of the local share tax brings a 0.19 per cent increase in total expenditures, a one per cent increase in subsidies results in a 0.24 per cent increase in total expenditure. The significant F-value (16, 28) also indicates the soundness of this model.

Table 3 Regression Analysis of Total Expenditure (1)

Repressor	Coefficient	Standard error	T-Ratio[Prob]
CONSTANT	1.3046	2.2468	.5807[.566]
LOGOWN	.4888	.0527	9.2804[.000]
LOGLST	.1860	.0836	2.2216[.035]
LOGSUB	.2442	.0504	4.8440[.000]
LOGELE	.0104	.0680	.1533[.879]
LOGOFF	-.0089	.1345	-.0664[.948]
LOGPOP	.0422	.1206	.3503[.729]
LOGRLP	.0039	.1545	.0251[.980]
TREND	.0043	.0116	.3711[.713]
KGD	-.0865	.0710	-1.2186[.233]
KWD	-.0210	.0805	-.2603[.797]
CBD	-.0568	.0982	-.5780[.568]
CND	-.0628	.0721	-.8710[.391]
JBD	-.0622	.0798	-.7788[.443]
KBD	-.0720	.0436	-1.6495[.110]
KND	-.0934	.0539	-1.7336[.094]
JJD	-1.704	.2661	-.6405[.527]

R² = .9991

F (16, 28) = 1855.5

DW = 1.5324

Note: LOGOWN = log value of own income (local tax + non-tax revenue). LOGLST = log value of local share tax. LOGSUB = log value of subsidies. LOGELE = log value of percentage of voting for congressional candidates of the president's party. LOGOFF = log value of number of public officials per 1,000 population. LOGPOP = log value of population size. LOGRLP = log value of road length per person. TREND = time related trends. KGD = Kyonggi province. KWD = Kangwon province. CBD = Chungbuk province. CND = Chungnam province. JBD = Jeonbuk province. JND = Jeonnam province. KBD = Kyongbuk province. KND = Kyongnam province. JJD = Jeju province.

Since our main interest is in the impact of central grants on local government total expenditure, it is useful to calculate the regression equations specifically for OWN, LST, and SUB. The results obtained are presented in Table 4.

Table 4. Regression Analysis of Total Expenditure (2)

VARIABLE	COEFFICIENT	STANDARD ERROR	T-RATIO (PROB)
CONSTANT	1.3600	.0751	18.0867 (.000)
LOGOWN	.4516	.0216	20.8410 (.000)
LOGLST	.1977	.0286	6.9604 (.000)
LOGSUB	.3172	.0355	8.9187 (.000)

R² = .9986

F (3, 41) = 10048.4

DW = 1.5710

Table 4 suggests that OWN still has the most important variable effect upon local government total expenditure. A one per cent change in OWN is associated with a 0.45 per cent change in total expenditure. In addition, SUB is still more important than LST. While a one per cent variation in SUB brings a

0.32 per cent change in total expenditure, a one per cent change in LST results in only a 0.20 per cent change in total local government expenditure. The three variables all together explain 99 per cent of the variations in total government expenditure.

Moreover, since the coefficient of LST is less than one (equal 0.1977), this means that local share tax has partial substitution impact on total expenditure. This suggests the hypothesis, which says that the impact of local share tax is partial substitution is correct. On the other hand, these results do not provide evidence for very strong stimulation effects.

Moreover, since the coefficient of LST is less than one (equal 0.1977), this means that local share tax has a partial substitution impact on total expenditure.

In an attempt to find explanation for this result, we interviewed nine people representing the three different categories. These included three professors of public finance, three local public officials who work at the department of public finance in a local authority, and three central public officials who also work for the ministry of Finance & Economy. The selected groups originally came from three different areas. We did that to avoid the bias towards their areas. All were asked the following question: "Our results show that central grants have had partial substitution effects on total local government expenditure, which means only part of the central grant had been used to increase expenditure. The question to be asked, what do you think the rest of the grant had been spent for?"

Professor Rhee answered that 'Most local authorities cannot raise adequate funds to balance the outcome, which they consider the needs are absolute. This means that the central government grants simply help to prevent the budgetary deficit of local government. Only a few governments enjoy the central government grant in increasing total expenditure.'

Professor Chung argued that 'In the case of a general welfare policy, the actual benefit delivered or transferred into the under-classes is reduced by the funds which leak into public officials, so it is called - corruption, graft. It is revealed that a large part of the fund gives benefits to the public officials for this reason. It can be assumed that in the case of central grants the situation

will be similar.'

Mr. Kim (Central public official) believed that 'Subsidy is used for special projects and all money coming from this source must be spent for the specific project and there is no chance for local authorities to use it for other purposes. But local share tax can be used to cut local tax, therefore, it is possible that the local share tax had been used to reduce the local tax rate.'

Mr. Jin (Local public official) stated that 'This is an unexpected result that the local share tax does not have any substitution effect upon the total expenditure of local government because it fills up the standard fiscal need in South Korea. In the case of ordinary expenditure, there is also no substitution effect, in this case because the fund it must be spent without any relation to local share tax, and because the local share tax cannot be transferred where the local authority is rich enough.'

The answers of the four interviewees reflect well the realities of Korean fiscal structure and administrative behaviour. In particular it would seem that the response of Dr. Rhee is most persuasive insofar as his evidence reflects the political and administrative realities.

On the other hand, these results do not support the hypothesis "the impact of subsidies will be to stimulate a local authority's expenditure."

In an attempt to find an explanation for this result, we asked the following question to all interviewees: "In theory, subsidies should have stimulation effects, in which case changes in subsidy would bring in an increase in total expenditure that exceeded the subsidy, but our results suggest that subsidy in South Korea had no stimulation effect. In your opinion what are the reasons behind this situation?"

Professor Hwang answered that 'they may be a stimulation effect upon local government expenditure within the subsidy itself. If there is a limitation on increasing local revenue from the local fiscal policy, there cannot be a great change in the total expenditures because of a new subsidy project "A" carried out by a reduction of the existing project "B". However, we can expect that it may stimulate to a certain extent.'

Mr. Kim (Central public official) believes that 'Most projects were financed entirely from subsidy although they can finance this project from local tax.

They only used subsidy to establish these projects. As a result it is quite understandable to find that subsidy didn't bring in a stimulation effect for local government total expenditure.'

Mr. Park (Local public official) stated that 'local government is so used to receiving central government grants and they have only filled the gap to balance the budget. In other words, local government has not done best to create its own funding resources.'

The three answers with which the interviewee responded again seem to reflect the Korean fiscal structure and the behaviour of administrators. The testimony of Dr. Hwang seems especially pertinent here.

The Effects of Central Grants on Local Expenditures by Functions

As pointed out earlier in section 2, central grants consist of several types of grants, such as subsidies (matching grants) and local share tax (unconditional grants). Subsidies are government aid for specific local public goods. If local authorities receive matching central grants for specific public goods, they may spend a portion of the budget used in producing the public goods to provide other local authority goods and services. Therefore, we can infer that matching grants may positively affect local authority expenditure by function. Local share tax (unconditional grants) may also positively affect local expenditure by function since unconditional grants may improve the production power of all local governmental goods and services.

In the previous section, analysis of local government expenditures was conducted in terms of total expenditures to find the relative importance of each selected variable. This section attempts to identify the important variables by each function such as general administration expenditures (GAE), social welfare expenditures (SWE), industry and economy expenditures (IEE), and regional development expenditures (RDE). Parliament, culture and physical education and support and order are excluded here since their weight is relatively small and since they only became recognised categories from 1988. As our data started in 1975 these variables cannot therefore be

included. Table 5 below shows local authority expenditure by functional and account in the fiscal year 1995.

Table 5 Local Government Expenditures by Function and Account-1995

(Unit: in million Won & %)

Account Category	Total	G/A	P.E.S/A	O.S/A
Total	58,990,628 (100.0)	40,372,894 (100.0)	8,984,752 (100.0)	9,632,982 (100.0)
National Assembly	238,482 (0.4)	238,482 (0.6)	-	-
General Administration	7,979,396 (13.5)	7,974,665 (19.8)	-	4,731 (0.1)
Social Welfare	6,910,151 (11.7)	5,959,094 (14.8)	-	951,057 (9.8)
Industry and Economy	7,789,049 (13.2)	6,826,800 (16.9)	-	962,249 (10.0)
Regional Development	28,581,671 (48.5)	11,984,987 (29.7)	8,984,752 (100.0)	7,611,932 (79.0)
Culture and Physical Education	2,342,350 (4.0)	2,256,839 (5.6)	-	85,511 (0.9)
Civil Defence	672,742 (1.1)	672,742 (1.6)	-	-
Support and Other.	4,476,787 (7.6)	4,459,285 (11.0)	-	17,502 (0.2)

Note: G/A: General Account. P.E.S/A: Public Enterprise Special Account O.S/A: Other Special Account.

Source: Ministry of Home Affairs, Financial Yearbook of Local Government, 1996. pp. 48-49.

Analysis of General Administration Expenditures

General administration covers daily administrative functions such as planning management, public information collection and delivery, home affairs administration, financial affairs administration (short-term debt management, tax collection) and so forth. To analyse the impact of central grants on general administration expenditure, as in the above analysis of total

expenditures, we use quantitative techniques. In quantitative techniques both correlation and regression are employed to establish the relationship between general administration expenditures and some selected variables. Again, local share tax and subsidies are included as the main types of central grant.

It is worth mentioning that the importance of the determinants of general administration expenditures are expected to differ from those in total expenditures. In particular, local share tax (LST) and own income (OWN) are expected to be the most important factors that affect general administration. This is because whenever local authorities receive more LST or OWN, they are likely to spend it on general administration since the other functions can be supported by subsidies. On the other hand, subsidies are not expected to be significant since they are not usually given for general administration expenditures.

Correlation Analysis

In this subsection we use correlation analysis to determine the variables which are strongly associated with general administration expenditures. In doing so, we replace local government expenditure with general administration expenditure. The explanatory variables are the same as the those used in the correlation analysis of total expenditure. The correlation coefficients are presented below in Table 2.

Table 2 showed that, as unexpected, subsidies (SUB = .9284) have the biggest correlation coefficient. Also, certain other variables are significant correlated with general administration expenditure - namely own revenue (local tax revenue + non- tax revenue) of each province (OWN = .8998), local share tax (LST = .8255), land size (AREA = -. 2554), per cent of voting for congressional candidates of the president's party (ELE = .3794), number of public officials per 1,000 population (OFF = .7681), population size (POP = .3501), and road length per person (RLP = .3331). All these variables have positive correlation coefficients except for AREA, implying that they vary in the same direction as general administration expenditure. As expected, the local government administrative capacity as measured by the number of

public officials per 1,000 population (OFF) showing strong ties with general administration expenditures in terms of correlation coefficients.

According to these results, then, OWN, LST, SUB, AREA, ELE, OFF, POP, and RLP seem to be the most powerful as explanatory variables for general administration expenditure. More detailed analysis of this equation is presented in the next section.

Regression Analysis

Table 6 presents the “ordinary least squares (OLS)” results to show the effects of central grants on general local administration expenditure. The results show that 99 per cent of the variations in general administration expenditure are explained by the variables included in the model. In addition, the results show that own income (OWN), local share tax (LST) and subsidies (SUB) are significant at 0.001, 0.5 and at 0.5 levels. The rest of the variables are insignificant.

Local share tax (LST) and own income (OWN) were expected to be significant and positively related to general administration expenditures. Contrariwise, subsidies are significant but negatively related to general administration expenditure. This negative relation can be explained by the fact that an increase in subsidies might cause a local authority to divert some money from general administration expenditure to the other functions so as to meet the conditions of the subsidies. As already mentioned in section II subsidies are conditional grants, which need to be matched by other money from each local authority’s own income.

The time related variable (TREND) is not significant. Also, none of the nine provinces’ dummy variables were significant.

Among the significant variables OWN is the most important one affecting general administration expenditure. Furthermore, the results show that a one per cent increase of the local share tax corresponds to a 0.90 per cent increase in general administration expenditure, while a one per cent increase of subsidies results in 0.50 per cent decrease of general administration expenditure. The significant F-value (17, 27) 114.0531 also indicates the

soundness of this model.

Table 6. Regression Analysis of General Administration Expenditures (1)

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CONSTANT	15.7828	46.5946	.3387[.737]
LOGOWN	.8611	.2034	4.2332[.000]
LOGLST	.9042	.3882	2.3289[.028]
LOGSUB	-.4996	.1889	-2.6440[.013]
LOGAREA	-1.2189	3.6293	-.3359[.740]
LOGELE	-.0495	.1181	-.4188[.679]
LOGOFF	-.2539	.4621	-.5495[.587]
LOGPOP	-.0333	.5619	-.0593[.953]
LOGRLP	.2592	.6033	.4296[.671]
TREND	-.0487	.0532	-.9144[.369]
KGD	-.4766	.4922	-.9684[.341]
KWD	.0021	1.1706	.0018[.999]
CBD	-.7985	1.6328	-.4890[.629]
CND	-.4677	1.1296	-.4140[.682]
JBD	-.6515	1.3546	-.4809[.634]
KBD	.4897	1.7606	.2781[.783]
KND	-.0173	.2072	-.0836[.934]
JJD	-2.3071	6.2628	-.3684[.715]

R² = .9956

F (17, 27) = 114.0531

DW = .9043

Regression equations for general administration expenditures are included also for OWN, LST, and SUB, as shown in Table 7.

Table 7 suggests that OWN is still the most important variable that effects general administration expenditure in local government. One per cent

changes in OWN relate to 0.56 per cent changes in general administration expenditures. In addition, LST is more important than SUB. A one per cent variation in LST brings a 0.35 per cent change in general administration expenditures and, expectedly, SUB is not significant in general administration expenditures. The three variables all together explain 98 per cent of the variations in general administration expenditure.

Table 7. Regression Analysis of General Administration Expenditure (2)

VARIABLE	COEFFICIENT	STANDARD ERROR	T-RATIO (PROB)
CONSTANT	1.0628	.2861	3.7144 (.001)
LOGOWN	.5644	.0824	6.8449 (.000)
LOGLST	.3567	.1089	3.2748 (.002)
LOGSUB	-.0462	.1353	-.3420 (.734)

R² = .9773

F (3, 41) = 588.3460

DW = .8606

The results show that local share tax has a partial substitution impact on general administration expenditure. Moreover, this result indicates that the local share tax has a greater impact on the general administration expenditure of local government than do subsidies.

Analysis of Social Welfare Expenditures

During the past three decades, the impressive economic progress in South Korea has been attributed to the centrally planned and implemented economic development policy (Chung, 1988). The main focus of this national economic development policy has centred around the principle of growth-first, redistribution-later. What economists call, “the unbalance-growth”

theory has been the predominant philosophy among politicians and academics alike. Sometimes, to placate the resisting forces of unsatisfied and neglected tax payers, the central policy makers have reasoned and rationalised their growth-only policy by using the analogy of the successful wealth accumulation of individuals and families. Frequently the growth-only policy has require strict frugality, or every retrenchment necessary to maintain minimal living standards (Hwang, 1987). In the name of economic growth as such, social welfare services have been largely neglected in Korea.

Therefore, social welfare expenditure for local authorities has covered only the basic needs of local residents, such as welfare, health and sanitation, park and green tract of land, and cleaning. Social welfare expenditure occupies 11.7 per cent of the total expenditure as was shown in Table 5.

Based on this observation, it may be assumed that the social welfare expenditure of local authorities is largely determined by central grants, unlike western societies where individual taxpayer demands - socio-economic and political - directly affect the determination of local authority social welfare expenditure.

Correlation Analysis

The technique of correlation analysis is used to identify the variables that are strongly associated with social welfare expenditure. Also it is used to determine the direction of the associations, be they positive or negative.

Table 2 shows the extent and direction of the correlation. Since the elderly play an important role in social welfare spending (Pelissero, 1985), the figures indicate the number of people of the elderly who is 65 years or above expressed as a percentage of the total population. The result shows that the correlation coefficient of AGE ($=.0262$) is insignificant. This is a very important point, suggesting, as mentioned earlier, that social welfare expenditure is not affected by age distribution. In other words, no part of social welfare expenditure is being given to elderly people, but it is mainly spent on general facilities. So the variation in the proportion of the elderly has little effect on social welfare expenditure. As expected, subsidies (SUB

= .9286) have the highest correlation coefficient. Moreover other variables, such as own revenue (local tax revenue + non- tax revenue) of each province (OWN = .9251), local share tax (LST = .7904), percentage of voting for congressional candidates of the president's party (ELE = .3358), number of public officials per 1,000 population (OFF = .7772), population size (POP = .3582), and road length per person (RLP = .2733) are also significantly correlated with social welfare expenditure. All these variables have positive correlation coefficients, which implies that the variables vary in the same direction as social welfare expenditure. These results show that OWN, LST, SUB, ELE, OFF, POP, and RLP are the main explanatory variables for social welfare expenditure. The more detailed analysis of these equations is presented in the next section.

Regression Analysis

Table 8 presents the "ordinary least squares (OLS)" results of calculating the effects of central grant on the social welfare expenditure of local government. The table covers only the explanatory variables which are included in the equation, of which OWN (LOGOWN) emerge as the one clearly significant factor.

The rest of the variables are insignificant or negative. The time related variable (TREND) is also not significant. Among the nine provinces dummy variables, only KGD and KND are significant, though the relationship is negative. This implies that social welfare expenditure depends on the significant variables listed above - that is OWN. The variables included in the regression equation explain more than 99 per cent of variations on social welfare expenditure. It can therefore be said with confidence that social welfare expenditure in South Korea depends on local authorities' own revenue. This means that the rich provinces which have greater financial capacity will enjoy better social welfare systems. The significant F-value (16, 28) = 352.1430 also indicates the soundness of this model.

Table 8 Regression Analysis of Social Welfare Expenditure (1)

Regressor	Coefficient	Standard Error	T-Ratio[Prob.]
CONSTANT	-.9664	6.3561	-.1521[.880]
LOGOWN	.7248	.1272	5.6992[.000]
LOGLST	.1566	.1944	.8054[.427]
LOGSUB	.1221	.1185	1.0302[.312]
LOGELE	.1029	.1612	-.6385[.528]
LOGOFF	.0805	.3149	.2557[.800]
LOGPOP	.0288	.3434	.0842[.934]
LOGRLP	.1100	.3624	.3035[.764]
TREND	-.0111	.0270	-.4126[.683]
KGD	-.3892	.1675	-2.3243[.028]
KWD	-.2793	.1908	-1.4639[.154]
CBD	-.3242	.2373	-1.3662[.183]
CND	-.0453	.1720	-.2632[.794]
JBD	-.0637	.1906	-.3342[.741]
KBD	-.1302	.1030	-1.2647[.216]
KND	-.2895	.1262	-2.2941[.029]
JJD	-.2264	.6340	-.3571[.724]

R² = .9956

F (16, 26) = 352.1430

DW = 1.4363

Since our main interest is in the impact of central grants on local authority social welfare expenditure, we must therefore calculate regression equations to include only OWN, LST, and SUB. The results obtained are presented in Table 7-9.

Table 9 indicates that, like general administration expenditure, OWN is still the most important variable that effects social welfare expenditure in local authority. A one per cent change in OWN correlates with a 0.50% change in social welfare expenditure. In addition, unlike general administration

expenditure, SUB is more important than LST. While a one per cent variation in SUB is associated with a 0.27% change in social welfare expenditure, a one per cent change in LST results in only a 0.20% change in social welfare expenditures. The three variables all together explain 99% of the variation in social welfare expenditures.

Table 9. Regression Analysis of Social Welfare Expenditure (2)

VARIABLE	COEFFICIENT	STANDARD ERROR	T-RATIO (PROB)
CONSTANT	-.7587	.2038	-3.7220 (.001)
LOGOWN	.4980	.0587	8.4762 (.000)
LOGLST	.2039	.0776	2.6281 (.012)
LOGSUB	.2739	.0964	2.8414 (.007)

R² = .9904

F (3, 41) = 1410.7

DW = 1.6459

The results also show that LST has a partial substitution impact on social welfare expenditure. In contrast with the finding of Boyne (1990) in U. K, the stimulation impact of subsidies on social welfare expenditure is not confirmed in South Korea. In conclusion, this result indicates that subsidies have bigger impact on the social welfare expenditure of local authorities than does local share tax.

Analysis of Industry and Economy Expenditure

Industry and economy expenditure covers agriculture (livestock, sericulture, fishery, forestation, rural guidance, and farmland improvement), commerce and industry. Industry and economy expenditure accounts for 13.2% of the total expenditure in 1995, as shown in Table 5.

Initially launched by the central government in 1971 to improve the environment, living conditions, and incomes of the rural population, the “New Community Movement (Sae-ma-eul Un-dong)” in Korea accounts for most of the expenditure on industrial and economic services. As a matter of fact, the New Community Movement has also encouraged a higher level of industrial and economic expenditures (Hwang, 1987) For example, local authorities have to increase their subsidies to farmers by setting relatively high prices for grains. Advanced agricultural technology has to be made more widely available through extended governmental services. The local bureaucracy must be mobilised to ensure that the programme be carried through in the community.

Due to the nature of local industrial and economic services as such, it is assumed that Korean local expenditure for industrial and economic services is determined by the demands of each locality, i.e.. socio-economic variables, rather than governmental or political characteristics. Regarding central grants, subsidies may be expected to have a bigger impact on industrial and economic expenditure than does the local share tax. Most of the industrial and economic projects involve financial outlays beyond the resources of local authorities that must therefore apply for subsidies to help them to raise the money for such projects. Moreover many industrial projects are financed completely from central government, as has happened according to the national plan.

Correlation Analysis

As Table 2 shows, subsidies (SUB) have the biggest correlation coefficient, followed by certain other variables, namely OWN, LST, AREA, ELE, OFF, and RLP. All these variables are significantly correlated with industry and economy expenditure and have positive correlation coefficients, except AREA. This implies that, with the exception of AREA, that all other variables vary in the same direction as industry and economy expenditure.

From there regression equations OWN, LST, SUB, AREA, ELE, OFF, and RLP emerge as the most significant explanatory variables for industry and

economy expenditure.

Regression Analysis

Table 10 presents the regression calculations for the effects of central grant on local government expenditure for industry and economy. The results reveal that subsidies have a bigger impact than does the local share tax on industry and economy expenditure in this spending category. That is, while SUB has a positive and significant coefficient, LST is not significant. Additionally, ELE, RLP are also significant. The rest of the variables are insignificant. This implies that industry and economy expenditure depends on the significant variables such as subsidies (SUB), voting for the president's party (ELE), and road length per person (RLP). The variables included in the regression equation explain more than 98 per cent of variations on industry and economy expenditures. Among the significant variables SUB is the most important variable that affects industry and economy expenditures.

The time related variable (TREND) has positive and coefficients significance. The coefficient of trend indicates that the industry and economy expenditure of local authorities increases by 4.7 per cent annually. Among the nine provinces dummy variables only Jeju province (JJD) is both negative and statistically significant at 0.10 level. JJD shows a smaller total spending per capita than Jeonnam province (JND), a reference group. It indicates that JJD spent the least per capita during 1975-1995 for this category. The significant F-value (6, 38) also indicates the soundness of this model.

Having done that in what follows we regress the industry and economy expenditure for OWN, LST and SUB only. The results are obtained and set out in Table 11.

The result shows that, unlike general administration expenditure and social welfare expenditures, SUB is still the most important variable that effects industry and economy expenditure in local authority. A one per cent change in SUB brings a 0.82 per cent change in industry and economy expenditure. In addition, again in contrast with general administration expenditure, SUB is more important than LST. Moreover, the results show

than 98 per cent of variation in industry and economy expenditures are explained by LST, OWN, and SUB.

Table 10. Regression Analysis of Industry and Economy Expenditure (1)

Repressor	Coefficient	Standard Error	T-Ratio (Prob.)
CONSTANT	3.5064	2.0888	1.6787 (.104)
LOGOWN	.7696	.0179	.0429 (.966)
LOGLST	-.2152	.2630	-.8179 (.420)
LOGSUB	.8635	.1491	5.7930 (.000)
LOGAREA	-.0116	.0264	-.4388 (.664)
LOGELE	-.2326	.2355	-.9876 (.332)
LOGOFF	-.2468	.3265	-.7557 (.456)
LOGRLP	.5826	.2865	2.0334 (.052)
TREND	.0475	.0243	1.9518 (.061)
KGD	.2577	.1904	1.3532 (.187)
KWD	-.2329	.2237	-1.0411 (.307)
CBD	-.2295	.1777	-1.2918 (.207)
CND	.0143	.1473	.0971 (.923)
JBD	-.1767	.1499	-1.1784 (.249)
KBD	-.1079	.1419	-.7605 (.453)
KND	-.1337	.1776	-.7531 (.458)
JJD	-1.2044	.4384	-2.7473 (.010)

R² = .9903

F (16, 28) = 178.4632

DW = .9878

Table 11. Regression Analysis of Industry and Economy Expenditure (2)

VARIABLE	COEFFICIENT	STANDARD ERROR	T-RATIO (PROB)
CONSTANT	-1.2935	.2847	-4.5422 (.000)
LOGOWN	-.0075	.0178	-.4067 (.686)
LOGLST	.2464	.1173	2.0992 (.042)
LOGSUB	.8243	.1106	7.4520 (.000)

R² = .9796

F (3, 41) = 657.3250[.000]

DW = 1.0169

In line with Boyne’s (1990) theory, the results show that local share tax has a partial substitution impact on industry and economy expenditure. Unlike Boyne, though, the stimulation impact of subsidies on industry and economy is not confirmed by this result in South Korea. Moreover, this result indicates that the subsidies have a much bigger impact on the industry and economy expenditure of local authorities than does the local share tax. The most important conclusion to be drawn from this result is that industrial and economic projects no longer depend on local government revenues.

Analysis of Regional Development Expenditures

Expenditure for regional development in Korean local government covers those services related to the urban development, construction, flood control and sewerage, and traffic management functions. Regional development expenditure accounts 48.5 per cent of the total expenditure, which is the biggest share in local government expenditure as shown in table 5. Regional development expenditure is considered to be greatly influenced by politics. The construction of more infrastructures, a greater supply of water and housing, and better resort facilities, such as parks and recreation centres, have been highly political issues. They have frequently mushroomed in campaign

platforms when an election season is near (Hwang, 1987). Nevertheless, as in the total expenditure analysis, these policy agenda can rarely be carried through unless the elected candidate is able to manage governmental arrangements in South Korea.

Hence, it is supposed that the political variables must be reflected in the governmental factors (i. e. central aid, financial capacity, governmental service) which will, in turn, impact directly on the local government regional development expenditures.

Correlation Analysis

The correlation results in table 2 above show that OWN, LST, SUB, ELE, OFF, POP, and RLP are strongly correlated to regional development expenditure. All these variables have positive correlation coefficients, which implies that they vary in the same direction as regional development expenditure. Following the same strategy, we can identify OWN, LST, SUB, ELE, OFF, POP, and RLP as explanatory variables for regional development expenditure. The calculations are presented in the next section.

Regression Analysis

The regression equations are presented in Table 12, giving support to the theory that subsidies have a bigger impact than local share tax. Among the explanatory variables which are included on the equation, SUB is positively and statistically significant, and RLP is negatively significant as an explanatory variable for regional development expenditure. The rest of the variables such as OWN, LST, ELE, OFF, POP, and RLP are insignificant.

The variables included in the regression equation explain more than 98% of variations on regional development expenditures. As expected, among the variables SUB is the most important that affects regional development expenditures. Specifically, a one per cent increase in the subsidies brings a 0.51% increase in regional development expenditures.

Table 12. Regression Analysis of Regional Development Expenditure (1)

Regressor	Coefficient	Standard Error	T-Ratio (Prob)
CONSTANT	-1.5657	7.5525	-.2073 (.837)
LOGOWN	-.0087	.0146	-.5968 (.555)
LOGLST	.2053	.2326	.8826 (.385)
LOGSUB	.5057	.1247	4.0558 (.000)
LOGELE	.1599	.1910	.8375 (.409)
LOGOFF	-.0256	.3754	-.0682 (.946)
LOGPOP	.2486	.4024	.6177 (.542)
LOGRLP	-.7568	.4295	-1.7619 (.089)
TREND	.0475	.0293	1.6216 (.116)
KGD	.2219	.1693	1.3106 (.201)
KWD	.6950	.1884	3.6884 (.001)
CBD	.4882	.2676	1.8241 (.079)
CND	-.0207	.2080	-.0997 (.921)
JBD	.1255	.2291	.5477 (.588)
KBD	.0784	.1262	.6213 (.539)
KND	.0504	.1544	.3265 (.746)
JJD	.5044	.7478	.6745 (.506)

R² = .9928

F (16, 28) = 240.4941

DW = 1.9320

The time related variable (TREND) is positively significant. The coefficient of trend indicates that the regional development expenditure of local government increases by 4.8% annually. Among the nine provinces' dummy variables only Kangwon province (KWD) and Chungbuk province (CBD) are significant at 0.10 level or higher. KWD and CBD show bigger regional development spending per capita than JND, a reference group. This indicates that JND did not spend much money on this category, compared to other provinces. The significant F-value (7, 37) also indicates the soundness of this

model.

To examine the impact of central grants on regional development expenditure in the next step, we calculate the regression equation, including only own income (OWN), local share tax (LST), and subsidies (SUB). The results are given in Table 13.

Like industry and economy, Table 13 suggests that SUB is still the most important variable that effects regional development expenditures in local government. A one per cent change in SUB is associated with a 0.91 per cent change in regional development expenditures. In addition, OWN and LST are also significant in regional development expenditures. The three variables all together explain 98 per cent of the variations in regional development.

As with the other three categories, the results show that local share tax has a partial substitution impact on industry and economy expenditures. Unlike previous studies, the impact of subsidies on regional development expenditure stimulation is not confirmed by this result in South Korea. In conclusion, this result indicated that the subsidies have much bigger impact on regional development expenditure of local government than local share tax.

Table 13. Regression Analysis of Regional Development Expenditure (2)

VARIABLE	COEFFICIENT	STANDARD ERROR	T-RATIO[PROB]
CONSTANT	-.2557	.3044	-.8400[.406]
LOGOWN	.0100	.0190	.5300[.599]
LOGLST	.0853	.1234	.6913[.493]
LOGSUB	.9142	.1179	7.7542[.000]

R² = 9750

F(3, 41) = 533.8282

DW = 1.4425

Conclusion and Policy Implications

The main purpose of this paper has been to examine the fiscal relations between central government and local authorities over the period 1975-1995 in South Korea. Specifically it aimed empirically to investigate the impact of central government grants on local government expenditure. Several interesting results were obtained.

In summary, the evidence supports the first hypothesis that subsidies have a bigger impact than local share tax on the local government expenditure. Overall, the impact of subsidies (SUB) on local government expenditures appears, at least, similar to or greater than local share tax (LST) except general administration expenditure (GAE). The reason is that since the central government requires a local authority to spend subsidies for a specific purpose, there is little room to use them for other purposes. As a result, subsidies are more stimulative than local share tax on the local authority expenditure. (Ahn, 1995)

The second hypothesis was that “the local share tax will have a partial substitution effect on a local authority’s expenditure”. The empirical finding of the study accepted this hypothesis for total and all functional expenditures. Interviewees were asked to comment upon this finding. They pointed to a number of possible explanations to account for these results - for example that local share tax has been used to reduce the local tax rate; that central government grants have been used to make good the local budgetary deficit; and even that there may have been a mild element of subvention or corruption.

Finally, the third hypothesis that “the impact of subsidies will be to stimulate a local authority’s expenditure” was not supported by the empirical findings for total and four functional expenditures. In an attempt to find an explanation for this result, interviewees were asked to comment on this finding. They reveal that there may be a stimulation effect upon local government expenditure within the subsidy itself. Others believe that most projects were financed entirely from subsidies although they can finance this project from local tax. They only used subsidies to establish these projects.

Alternative views stress that local government is so used to receiving central government grants and this has only filled the gap to balance the budget.

All models used show significant F-values and even in main four spending categories relatively high R²'s are reported. SWE measure experiences the highest R² (0.99), and RDE measure the lowest (0.9750).

These results had a very useful policy implication. Bearing in mind the fact that local self-autonomy in South Korea was only recently introduced in 1991, such finding have various policy implications. First, the result suggested that subsidies have had a bigger effect than local share tax on local authority expenditure, this means the subsidies is more effective than local share tax as policy tool, that bring in more change in local authority expenditure. Under such case, subsidies provide more reasonable way to bridge the gap between local authorities regarding the expenditure. Therefore, the greater impact on expenditures of subsidy future emphasizes their importance in the local authority finance in the future and, therefore, requires efficient and continuous effects to provide them.

Moreover, area size (AREA), voting for congressional candidates of the president's party (ELE), number of public officials per 1,000 population (OFF), population size (POP), and road length per person (RLP) appear to be important factors in local government expenditure. But percentage of population who is 65 years or old (AGE), population density (DEN), number of motor vehicles (NMV), and percentage of population living in urbanised area (URB) are less significant in total and four functional expenditures equation models.

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