Effects of Government Activities on Private Consumption: Evidence from Japan*

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Abstract

In this paper, we develop Barro's (1981) "effective" consumption theory, and combine it with the Euler equation to estimate the effects of government activities on private consumption for Japan (1964-2000). We find that: (1) Government consumption expenditure exhibits stronger influence on private consumption expenditure than public debt outstanding; (2) Current government consumption expenditure and public debt outstanding show positive effects on private consumption expenditure, which is contrary to their past values; and (3) Current public debt outstanding as well as its past values and past government consumption expenditures, may affect present government consumption expenditure.

Keywords: Private consumption expenditure, Government consumption expenditure, Public debt outstanding.

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1. Introduction

Many empirical studies have tried to investigate the effects of fiscal policies on private consumption. Feldstein (1982)'s analysis shows that changes in government spending or taxes can have substantial effects on aggregate demand, and there is no indication of ex ante crowding out through consumers' reactions to government debt or government spending. Kormendi (1983) provided some evidence on the effects of government spending, taxation, government interest payments, and government debt, and the differing effects of components of government spending on private consumption by the so-called consolidated approach, in which he presented supportive evidence for the crowd-out effects of government spending and government debt on private consumption. Aschauer (1985) combined "effective" consumption with the Euler equation and a rational expectations assumption to test the joint Ricardian equivalence-rational expectations hypothesis and the substitutability of government spending for private consumption. He considers that the evidences from the U.S.A. (1948-81) support the hypothesis and the conclusion of the substitutability of government spending for private consumption. Cambell and Mankiw (1990) found evidence against the substitutability between government spending and private consumption. Graham (1993)'s estimation indicates that federal nondefense spending substitute for private consumption. Cardia (1997) even shows that the effects of taxation and government debt on consumption are not robust by applying simulated series data, which means that earlier relevant tests might not be capable of providing conclusive evidence about debt neutrality and equivalence, whether debt neutrality and equivalence is true or not.

The previous studies can be divided into two types. One is the studies based on Permanent Income Hypothesis or Disposable Personal Income Specification (non-Euler equation estimation). These include Feldstein (1982), Kormendi (1983), etc. Another is the Euler equation estimation, in which Aschauer (1985) is a representative. Both of them could not provide a consistent conclusion. The methods used in them are also disputable. As known, Permanent Income Hypothesis is not completely realistic, while Liquidity Constraint Hypothesis neglects other information (e.g. government consumption expenditures, public debt issue and redemption) that may greatly affect private consumption decisions. Also as known, many empirical estimates are developed by using the definition of disposable personal income, but the estimated result often displays inconsistent signs for the relevant components, such as taxes, corporate retained earnings and government interest payments (typically see Kormendi (1983)). Aschauer (1985) also pointed out some questions in the previous studies (e.g., the serial correlation problem in the data), and instead utilize the Euler equation to investigate the effects of fiscal policies on private consumption. However, Aschauer's (1985) assumption of that past taxes or public debts or deficits may help to predict current government consumption expenditure is weak. The current government consumption expenditure and pubic debt may provide more important information than their past values in estimating present private consumption expenditure, for they are approved by Parliament in advance, which are information available up through time t .

In the present paper, we develop Barro's (1981) "effective" consumption theory and incorporate it with the Euler equation to investigate the effects of government activities on private consumption for Japan (1964-2000). We specially emphasize that government activities include government consumption expenditure and public debt issue and redemption. The empirical evidence suggests that: (1) Government consumption expenditures exhibits stronger influence on present private consumption expenditure than public debts; (2) Current government consumption expenditure and public debt outstanding show positive effects on private consumption expenditure, which is contrary to their past values; and (3) Current public debt outstanding as well as its past values and past government consumption expenditures, may affect present government consumption expenditure.

The composition of the paper is as follows. In Section 2, we elucidate the theoretical framework. In Section 3, we give an empirical estimation. The last concludes.

2. Combination of "Effective" Consumption and Euler Equation

In this section, we develop Barro's (1981) "effective" consumption theory, and explain how the Euler equation and its incorporation with the theory, the basis of the estimation, are derived.

2.1. "Effective" Consumption Theory

As Barro (1981), there are two types of public goods and services provided by government. One form is considered as a direct conveyer of utility to households, such as parks, libraries, school lunch programs, hospitals, highway and transportation programs. Another one is viewed as an input to private production processes, such as national defense, fire and police services, education, and various regulatory activities. That is, government provide public goods and services that are partly of the direct-utility type and partly of the productive-input type (see, Barro, 1981, p.1090).

First, suppose that household utility depends on the "effective" consumption flow at each period, $C_t^* \equiv C_t + \theta G_t (0 \leq \theta \leq 1)$, which denotes the level of "effective" consumption in period t , a linear combination of private consumption (C_t) and changes in government goods and services (G_t). Each unit of G_t is views as providing goods and services that are equivalent to a fraction of a unit of contemporaneous private consumption expenditure. The formulation neglects the substitution between the non-contemporaneous values of C_t and G_t , The provision of G_t means that households obtain units of effective consumption, C_t^*, that exceed the quantity of private real expenditures. With $\overline{G}$ held fixed, θ here measures the marginal utility substitution between C_t and G_t.

Second, consider the role of government goods and services as an input to private production processes. Supposing that a change in government goods and services can alter private sector real incomes in accordance with, the marginal product of government goods and services (MPG), the net effect now depends on the term ($\theta + MPG - 1$), which is nonpositive but no greater than one in magnitude if $0 \leq \theta + MPG \leq 1$ applies (see, Barro, 1981, pp.1091-93). Aschauer (1985, p.118) noted that he ignored this type of channels of influence of government spending on the economy such as providing infrastructure capital as an input to private production processes.

In the present paper, we specially emphasize that government producer creates two types of goods and services in period t, government consumption expenditure (GC_t), and public debt issue and redemption which are delegated by public debt outstanding (PD_t). Then a developed "effective" consumption equation may be written as $C_t^* \equiv C_t + \theta_1{}^* GC_t + \theta_2{}^* PD_t$. The former ($GC_t$) includes intermediate inputs (government purchases), payment to public servants', medical and care benefits etc., which are mainly consumed based on tax-finance by government itself. It is apparent that they directly add utilities to private agent. The latter (PD_t) not only provides private agent one safety investment instrument but also improves private welfare through debt-finance activities (e.g., public projects). It not only directly increases private agent's disposable income through interest payment but also indirectly increases private agent's utilities. For example, government can adjust money supply through open market operation (selling or buying the issued public debts). Issuing and exchange markets of public debts can improve private agent's financial environment as well. Debt-finance public investment can provide infrastructure for private production process which may remarkably accelerate social and economical development.

One important characteristic is that the latter (PD_t) needs to be redeemed by future tax which is different from the former (GC_t). For this reason, private agent may concern a tax increasing in the future which would offset the wealth effect and social welfare improvement effect of public debts.

2.2. Euler Equation and Its Incorporation with "Effective" Consumption Theory

Aschauer (1985) assumed that past taxes (government consumption expenditures) or deficits (public debts) may help to predict current government and private spending. The assumption played an important role in testing the joint hypothesis of Ricardian equivalence-rational expectations. However, the assumption is weak. Because issues of public debts for time t are approved by Parliament in advance, they are information available up through time t . Government consumption expenditure has the same feature. Supposing the private agent is rational, it may be unnecessary to predict GC_t by past government consumption expenditures and public debts (at time $t-1$ and before). Maybe current government consumption expenditure and public debt outstanding may provide more important information in estimating present private consumption expenditure. Or we can at least say that Aschauer (1985) ignored the influences of current government activities on present private consumption expenditure. Another problem is that Aschauer (1985) ignored the influence of government infrastructure capital spending on the economy such as providing as an input to private production processes. For these reasons, in the following we describe briefly how the Euler equation and its incorporation with the "effective" consumption theory are derived, which is different from Aschauer's (1985).

It is assumed that a representative individual living in infinite horizon who has time-separable preferences over private consumption, C, and the goods and services flowing from the government sector, G. The agent's utility function is given by

$$V_t = \sum_{t=0}^{\infty} (1/(1+\delta)^t u(C_t^*) \qquad (1)$$

where δ is a constant rate of time preference and $u(\quad)$ is a time-invariant, concave momentary utility function.

The budget constraint in terms of effective consumption is

$$\sum_{t=0}^{\infty} (1/(1+r))^t C_t^* = (A_t - D_t) + \sum_{t=0}^{\infty} (1/(1+r))^t [W_t + (\theta - 1) G_t] \qquad (2)$$

where $A_t \equiv$ asset including government debt, $D_t \equiv$ government debt of one-period maturity, $W \equiv$ labour earnings and $T \equiv$ tax payments (net of transfers). That is, the present discounted value of effective consumption is constrained by the level of net economy wealth ($A_t - D_t$), plus the present discounted value of labour earnings, plus ($\theta - 1$) times the present discounted value of government expenditure.

The maximization of the individual's objective function (1) subject to the effective intertemporal budget constraint (2) yields as first-order necessary conditions

$$u'(C_t^*) = \lambda[(1+\delta)/(1+r)]^t, \; t = 0,1,2,\mathrm{K} \tag{3}$$

along with the intertemporal budget constraint (2). Here, λ is a Lagrangian multiplier attached to (2) in the consumer's maximization problem.

The consideration of the choice of consumption in two adjacent periods $t-1$ and t, leads to the Euler equations:

$$u'(C_{t-1}^*) = \lambda[(1+\delta)/(1+r)]^{t-1} \tag{4}$$

$$u'(C_t^*) = \lambda[(1+\delta)/(1+r)]^t \tag{5}$$

Incorporating (5) with (4), we obtain:

$$u'(C_t^*)/(1+\delta) = u'(C_{t-1}^*)/(1+r) \tag{6}$$

In order to obtain a closed-form solution for consumption, the form of preferences is restricted in the objective function (1). Assuming the momentary utility function is quadratic (see Hall (1978), Corollary 3).

$$u(C_{t-1}^*) = -(\overline{C}^* - C_{t-1}^*)^2/2 \tag{7}$$

$$u(C_t^*) = -(\overline{C}^* - C_t^*)^2/2 \tag{8}$$

where $\overline{C}^*$ is the bliss level of effective consumption.

By differentiating (7) and (8), we obtain

$$u'(C_{t-1}^*) = \overline{C}^* - C_{t-1}^* \tag{9}$$

$$u'(C_t^*) = \overline{C}^* - C_t^* \tag{10}$$

Substituting (9) into (6), we obtain

$$u'(C_t^*) = [(1+\delta)/(1+r)](\overline{C}^* - C_{t-1}^*) \tag{11}$$

Further, Substituting (11) into (10), the Euler equation is given by

$$C_t^* = [(r-\delta)/(1+r)]\overline{C}^* + [(1+\delta)/(1+r)]C_{t-1}^* \quad (12)$$

Supposing $\alpha \equiv [(r-\delta)/(1+r)]\overline{C}^*$, $\beta \equiv [(1+\delta)/(1+r)]$, the Euler equation is briefly given by

$$C_t^* = \alpha + \beta C_{t-1}^* \quad (13)$$

The empirical analysis assumes, again, quadratic utility but now in an explicitly stochastic environment so that the Euler equation (13) may be written as

$$E_t C_t^* = \alpha + \beta C_{t-1}^* \quad (14)$$

where E_t is the expectations operator conditional on information available up through period t.

Second, we explain how the Euler equation is incorporated into the "effective" consumption theory.

Consider now the developed "effective" consumption equation in two different periods t and $t-1$

$$C_t^* = C_t + \theta_1^* GC_t + \theta_2^* PD_t \quad (15)$$

$$C_{t-1}^* = C_{t-1} + \theta_1^* GC_{t-1} + \theta_2^* PD_t \quad (16)$$

Substitute (15) into Euler equation (13)

$$C_t + \theta_1^* GC_t + \theta_2^* PD_t = \alpha + \beta^* C_{t-1}^* \quad (17)$$

Further substitute C_{t-1}^* in (17) by (16), a combination of the developed "effective" consumption theory and Euler equation is easily obtained as

$$C_t = \alpha + \beta^* C_{t-1}^* - \theta_1^* GC_t + \theta_1 \beta^* GC_{t-1} - \theta_2^* PD_t + \theta_2 \beta^* PD_{t-1} \quad (18)$$

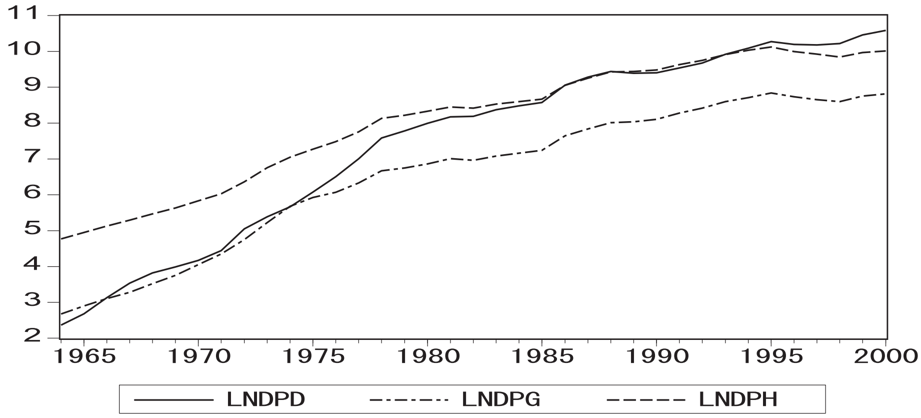
(If we just consider GC_t while omit PD_t, the same as (18), we can obtain the same result as Aschauer's (1985)).

3. Empirical Analysis

We intend to investigate the impacts of government activities on private consumption by applying the theoretical framework above. The data cover 1964-2000, which are from:

World Development Indicators, the Japanese SNA, Financial Economic statistics Monthly, Annual Public Debt Statistics Report, and Public Financial Statistics. Figure 1 shows the log-values of the variables.

Figure-1: Log-values of the Variables under Consideration



Notes: *PG* = General government final consumption expenditure per capita (current US$)
DPG = Deflated *PG* by government consumption deflator (1990=100)
PH = Household final consumption expenditure per capita (current US$)
DPH = Deflated *PH* by private consumption deflator (1990=100)
PD = Government debt outstanding per capita (Current US$)
DPD = Deflated *PD* by *GDP* deflator (1990=100)
LNDPG, *LNDPH* and *LNDPD* denote the log-values of *DPG*, *DPH* and *DPD*.

According to unit root tests by Augmented Dickey-Fuller (ADF) test and Phillips-Perron (P-P) test, we found that all of the variables used in the estimation are $I(0)$. That is, the data are stationary.

From (18), an empirical estimation equation is given as

$$LNDPH_t = c(1) + c(2)^* LNDPH_{t-1} + c(3)^* LNDPG_t + c(4)^* LNDPG_{t-1} + c(5)^* LNDPD_t + c(6)^* LNDPD_{t-1} + u_t \quad (19)$$

The coefficient restrictions are $c(4)=-c(3)^* c(2)$ and $c(6)=-c(5)^* c(2)$. The Ordinary Least Square (*OLS*) estimation is carried out, and the result is reported in table 1.

Table 1: Ordinary Least Square (*OLS*) Estimation (1965-2000)

Equation (19):

$$LNDPH_t = c(1) + c(2)^* LNDPH_{t-1} + c(3)^* LNDPG_t + c(4)^* LNDPG_{t-1} + c(5)^* LNDPD_t + c(6)^* LNDPD_{t-1} + u_t$$

Variable	Coefficient	t -statistic	Prob.
C(1)	0.0734	0.4319	0.6689
C(2)	0.9481	14.813	0.0000
C(3)	0.6682	14.1945	0.0000
C(4)	-0.6588	-9.7410	0.0000
C(5)	0.2580	6.2158	0.0000
C(6)	-0.2236	-5.1381	0.0000

R-squared = 0.9998, Adjusted *R*-squared =0.9998,
Durbin-Watson stat=1.5181, *F*-statistic (Prob.) = 35046.19 (0.0000).

Wald Test:

Null Hypothesis: $C(4) = -C(3)^* C(2)$ and $C(6) = -C(5)^* C(2)$
Chi-square (Prob.) = 1.2105 (0.5459).

The Wald test suggests that the hypothesis of $c(4) = -c(3)^* c(2)$ and $c(6) = -c(5)^* c(2)$ is accepted, which approves that the combination of the developed "effective" consumption theory and Euler equation is appropriate. Further, an estimation including a time trend is performed. But, we found that there is serial correlation problem in the estimation. In order to improve the estimation, we apply the method of Autoregressive Conditional Heteroskedasticity (*ARCH*). The popular *GARCH* (*1,1*) model is given as

$$\sigma_t^2 = C(8) + C(9)^* u_{t-1}^2 + C(10)^* \sigma_{t-1}^2 \qquad (20)$$

where σ^2 is the conditional disturbance variance, u is the disturbance term in (19).

We first perform an estimation based on the data of 1965-89. Then we extend the data to 2000, and perform the same estimation. The result is reported in Table 2 and Table 3, respectively.

Table 2: Autoregressive Conditional Heteroskedasticity (ARCH) Estimation (1965-89)

Equation (19) adding one time trend variable:

$$LNDPH_t = c(1) + c(2)^* LNDPH_{t-1} + c(3)^* LNDPG_t + c(4)^* LNDPG_{t-1} + c(5)^* LNDPD_t + c(6)^* LNDPD_{t-1} + c(7)^* time + u_t$$

Variable	Coefficient	z -statistic	Prob.
C(1)	-0.1348	-2.3172	0.0205
C(2)	1.0122	56.9843	0.0000
C(3)	0.6717	27.12428	0.0000
C(4)	-0.6433	-34.7380	0.0000
C(5)	0.2549	11.0279	0.0000
C(6)	-0.2841	-15.8440	0.0000
C(7)	0.0033	1.9891	0.0467

Variance Equation (20):

$$\sigma_t^2 = C(8) + C(9)^* u_{t-1}^2 + C(10)^* \sigma_{t-1}^2$$

Variable	Coefficient	z -statistic	Prob.
C(8)	0.0000	0.3203	0.7487
C(9)	1.2990	1.9965	0.0459
C(10)	0.0873	0.3580	0.7203

R-squared = 0.9998, Adjusted R-squared = 0.9997,
Durbin-Watson stat = 2.2887, F-statistic (Prob.) = 8362.677 (0.0000)

Table 3: ARCH Estimation (1965-2000)

Equation (19) adding one time trend variable:

$$LNDPH_t = c(1) + c(2)^* LNDPH_{t-1} + c(3)^* LNDPG_t + c(4)^* LNDPG_{t-1} + c(5)^* LNDPD_t + c(6)^* LNDPD_{t-1} + c(7)^* time + u_t$$

Variable	Coefficient	z -statistic	Prob.
C(1)	-0.2945	-3.5555	0.0004
C(2)	1.0663	34.4225	0.0000
C(3)	0.7179	36.7679	0.0000
C(4)	-0.7653	-107.2358	0.0000
C(5)	0.2220	9.2172	0.0000
C(6)	-0.2023	-7.8053	0.0000
C(7)	-0.0055	-5.4358	0.0000

Variance Equation (20):

$$\sigma_t^2 = C(8) + C(9)^* u_{t-1}^2 + C(10)^* \sigma_{t-1}^2$$

Variable	Coefficient	z -statistic	Prob.
C(8)	0.0000	0.8930	0.3718
C(9)	1.0605	1.8191	0.0689
C(10)	0.1799	1.0413	0.2977

R-squared = 0.9999, Adjusted R-squared = 0.9998,
Durbin-Watson stat = 2.3034, F-statistic (Prob.) = 23756.56 (0.0000)

It is shown that the estimated result is robust and statistically significant except for that the dummy variable changed its sign. The estimated coefficients for government consumption expenditures are more than around three times bigger than public debt outstandings (the absolute values), with the current values being positive while the past ones contrary. It is also shown that a decreasing trend exists for private consumption expenditure through the whole sample time. The estimated coefficients for the disturbance are significantly different from zero, which suggests that the assumption of conditionally homogeneous disturbances is rejected in favor of *ARCH* disturbances.

In order to test jointly whether the above estimates are robust and whether current public debt outstanding may affect current government consumption expenditure (we also assume that past government consumption expenditures and public debts may help to predict current private consumption expenditure), along with (19), we generate a two-equation system written as

$$LNDPH_t = c(1) + c(2)^* LNDPH_{t-1} + c(3)^* LNDPG_t + c(4)^* LNDPG_{t-1} + c(5)^* LNDPD_t + c(6)^* LNDPD_{t-1} + c(7)^* DM90 + u_t \quad (21a)$$

$$LNDPG_t = c(8) + c(9)^* LNDPG_{t-1} + c(10)^* LNDPG_{t-2} + c(11)^* LNDPD_t + c(12)^* LNDPD_{t-1} + c(13)^* LNDPD_{t-2} + v_t \quad (21b)$$

where u_t, v_t are serially uncorrelated respectively. *DM90*=1 after 1989, 0 otherwise.

Table 4 reports the estimated result of (21a) and (21b) by the method of Seemingly Unrelated Regression (*SUR*), also known as the multivariate regression or Zeller's method, to estimate the parameters of the system, accounting for heteroskedasticity (cross terms), and contemporaneous correlation in the errors across equations. The estimated result is consistent with the above estimates. A more rapid decreasing trend is found for private consumption expenditure since bubble economy collapsed in the beginning of the 1990s, for the estimated coefficient for dummy variable *DM90* is minus four percent compared to the whole period's decrease of minus one percent.

Table 4: Seemingly Unrelated Regression (*SUR*) Estimation (1965-2000)

	Coefficient	t-statistic	Prob.
C(1)	-0.3055	-1.7984	0.0773
C(2)	1.0806	17.4469	0.0000
C(3)	0.6523	17.5767	0.0000
C(4)	-0.6942	-12.4648	0.0000
C(5)	0.2652	8.0765	0.0000
C(6)	-0.2761	-7.6938	0.0000
C(7)	-0.0437	-3.6646	0.0005
C(8)	0.1766	2.3749	0.0209
C(9)	1.4770	11.3096	0.0000
C(10)	-0.7096	-4.9218	0.0000
C(11)	0.6646	6.9092	0.0000
C(12)	-0.8767	-5.5478	0.0000
C(13)	0.3913	3.4738	0.0010

Determinant residual covariance = 0.0000

Equation (21a):

$$LNDPH_t = c(1) + c(2)^* LNDPH_{t-1} + c(3)^* LNDPG_t + c(4)^* LNDPG_{t-1} + c(5)^* LNDPD_t + c(6)^* LNDPD_{t-1} + c(7)^* DM90 + u_t$$

R-squared=0.9999, Adjusted *R*-squared=0.9998
S.E. of regression = 0.0210, Durbin-Watson stat=2.3440

Equation (21b):

$$LNDPG_t = c(8) + c(9)^* LNDPG_{t-1} + c(10)^* LNDPG_{t-2} + c(11)^* LNDPD_t + c(12)^* LNDPD_{t-1} + c(13)^* LNDPD_{t-2} + v_t$$

R-squared=0.9986, Adjusted *R*-squared=0.9983
S.E. of regression=0.0733, Durbin-Watson stat=1.8471

The estimated result by different methods show little difference among them, which strongly support the conclusion of that the Euler equation is an efficient method for estimating private consumption expenditure, for the estimated coefficient on the lagged private consumption expenditure is around one. All of the estimated coefficients for the variables under consideration are statistically significant. In the private consumption expenditure equation, the estimated coefficients for current government consumption expenditure are around 0.6～0.7, more than around three times bigger than current public debt outstanding (around 0.2～0.3). Current government consumption expenditure exhibits strong positive influence on present private consumption expenditure which is in accord with Feldstein (1982) and Cambell and Mankiw (1990)'s, while is different from the conclusion of the substitutability of government spending for private consumption by Kormendi (1983), Aschauer (1985) and Graham (1993). On the contrary, past government consumption expenditure and public debt outstanding negatively affect present private consumption expenditure. It is also shown that current public debt outstanding and its past values as well as past government consumption expenditures may affect present government consumption expenditure.

In the following, we give some discussion on the empirical result for public debt outstanding.

Kormendi (1983, p.1005) obtains negative coefficient for public debt, and interprets it as: the real income from stream from public debt involves inflation risk and some default risk to the debt holders, while the future tax stream implied by the debt involves that same inflation risk and default risk plus considerable additional risk as to both its intertemporal and cross-sectional incidence, thus the current certainty equivalent value of the latter may exceed that of the former. Barro (1976, p.346) also argues that government deficits may make households sufficiently nervous to reduce their consumption demand when taxes are replaced by public debt issue. The empirical result suggests that past public debts negatively affect present private consumption expenditure which is consistent with these arguments. At the same time, the result suggests that current public debt outstanding positively affect present private consumption expenditure. It is consistent with conventional macroeconomic analysis. In conventional macroeconomic analysis, public debt affects the economy because private agent views it as net wealth. The larger the government debt is, the wealthier private agent feels and the more she consumes (Evans, 1988, p.983). Also as Barro (1974), if government makes use of public debts more efficiently than otherwise in private capital market, and can offer monopolistic fluid service for public debts, issuing of public debts may bring net wealth to private agent. The present conditions are: (1) public debts are often used to carry out productive activities such as infrastructure investment by government; (2) they are the main object of open market operation, providing one of the most important financial policy means for government; (3) in order to earn profits, private agent buys public debt, one of the highest safety financial assets. Also, she can sell the debts bought at the fairly developed second market in necessary. That is, the present conditions accord with Barro's hypotheses, under which public debt may bring net wealth to private agent in some degree.

4. Conclusion

In this paper, we developed the "effective" consumption theory and incorporated it with the Euler equation to investigate the impacts of government activities on private consumption expenditure. It is shown that current government consumption expenditure and public debt outstanding positively affect present private consumption expenditure which is contrary to their past values. It is also confirmed that current public debt outstanding and its past values, as well as the past government consumption expenditures may affect present government consumption expenditure.

In view of stimulating present private consumption expenditure, current government consumption expenditure shows relatively stronger influence than current public debt outstanding. However, the result also suggests that past government consumption expenditure and public debt outstanding negatively affect present private consumption expenditure. It is necessary to improve current government consumption expenditure to alleviate the contradiction between its strong budget constraint and its great influence on private consumption. As to public debt outstanding, we should not neglect the problems caused by its notable increasing. The huge public debt outstanding may bring heavy burden to the future generation. It will also give bad influence on the future fiscal balance by considering its redemption. Furthermore, we should not neglect the relationship of public debt and other policy issues, especially financial stabilization issues. It would be complicated to liquidate the great deal of public debts held by the big banks if these banks bearing latent risk of bankruptcy really go into bankruptcy. How to balance public finance itself and its balance with bank are significant subjects. Maybe it is necessary to enact public debt curtailment target by legislation in the future.

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