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FALLACY OF THE MULTIPLIER EFFECT: CORRECTING THE INCOME ANALYSIS

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Fallacy of the Multiplier Effect: Correcting the Income Analysis

by

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Abstract

Although the Keynesian multiplier effect of public works is criticized for lack of a microeconomic foundation, it is still taught in most undergraduate courses and believed to be useful for policy makers. However, it has a serious fallacy even if we accept the consumption function. This note shows that useless public works is equivalent to unemployment relief expenditure in the presence of unemployment and that the argument on the multiplier effect seriously misleads the present national accounting and thereby distorts evaluation of public works. A correction of the textbook explanation on the income analysis is also provided.

Although the Keynesian multiplier effect is criticized for lack of a microeconomic foundation, it has still been taught as a standard macroeconomic theory in most undergraduate courses. The criticism against it is mainly from lack of consideration on the intertemporal budget constraint --i.e., even loan expenditure generates no spillover effect on consumption once the intertemporal budget equation is taken into account. However, it is rather accepted that public works expenditure under a balanced budget increases the national income by its own size --i.e., the multiplier under a balanced budget equals one.[1] Since this property is independent of what is produced, it is believed that even useless public works is better than unemployment relief expenditure since the latter is a mere redistribution and hence does not increase the national income.[2]

This note shows that useless public works under a balanced budget is equivalent to unemployment relief expenditure whether the rational consumer behavior or the Keynesian consumption function is assumed --i.e., the balanced-budget multiplier is economically meaningless. Moreover, it provides an alternative income analysis that corrects the problem. A problem of the present national accounting owing to this misunderstanding is also pointed out.

1. Unemployment Relief Expenditure vs. Useless Public Works

First, suppose useless public works in which only labor services are used and compare its effect with that of unemployment relief expenditure. In the case of unemployment relief expenditure a government collects money as the unemployment insurance premium or a tax and pays unemployment allowance to the unemployed. In the case of 'useless' public works under a balanced budget the government collects taxes, hires the unemployed, leaves them doing nothing substantial and pays salaries to them. Thus, these two are exactly the same except under what name money is paid, viz. unemployment allowance or salaries. They are both mere redistributions without producing anything and hence the disposable income of the private sector remains unchanged, generating no effect on the national product.

The same logic applies to general public works in which some commodities such as concrete are required. A riverbank reinforcement project may be an example. Since salary

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[1] See e.g. Stiglitz (1997, pp.775-776) and Mankiw (2003, pp.264-265). It is called Haavelmo's theorem, as mentioned by Moene and Rodseth (1991).

[2] Keynes (p.127, 1936) himself states that even useless public works is better than unemployment relief expenditure since it creates new demand.

payment on labor services has the same effect as mentioned above, I focus on the effect of payment on concrete. Since concrete is produced of gravel and limestone, the payment is fully distributed to miners and haulers. Thus, it is equivalent to unemployment allowance to them as long as they would be unemployed without the project. The same logic applies to any commodity demand by public works, such as trucks, machineries, etc. Thus, in general, the effect of useless public works under a balanced budget is the same as that of unemployment relief expenditure.[3]

Proposition 1: Useless public works under a balanced budget is equivalent to unemployment relief expenditure.

There are two things worth noting. First, since the total disposable income does not vary and nothing useful is produced in both cases, the above property is valid regardless of which consumer behavior is assumed, the Keynesian consumption function or neoclassical rational behavior. Second, since the above result is valid in the case of a useless public works project, if it is of some use then it increases the national product by its resultant value. Thus, the following proposition obtains:

Proposition 2: Public works under a balanced budget generates no spillover effect on the national income. It raises the national product exactly by the value that it directly produces –i.e., the balanced-budget multiplier of public works with respect to the national product equals its efficiency rate.

2. Correction of Textbook Explanation on the Effect of Public Works

Why does the multiplier effect of public works seem to generate a different effect from that of unemployment relief expenditure in the Keynesian model? In most textbooks this property is described as follows:

$$y = c(y - t + z) + g + i, \tag{1}$$

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[3] There is a slight difference between useless public works and unemployment relief expenditure. The former hires people and hence reduces the deflationary gap in the labor market while the latter does not. A reduction in deflation makes it less advantageous for consumers to hold money than to consmue now and hence stimulates consumption. See Ono (2001) for this effect of public works in the steady state where persistent stagnation arises.

where y is income, z is unemployment allowance, c is the consumption function that depends on disposable income $y - t + z$, and g is public works spending. Without any loss of the present analysis investment i is assumed to be fixed. Under a balanced budget:

$$g + z = t, \tag{2}$$

from (1) it is immediately found that

$$dy/dg\big|_{z=0} = 1, \quad dy/dz\big|_{g=0} = 0,$$

-- i.e., the balanced-budget multiplier equals 1 whereas that of unemployment allowance is zero.

The fallacy comes from a confusion of public works expenditure and the value of its product. The private sector sells products and receives income that equals consumption c plus investment i. In addition, it pays tax t and receives either income from government spending g or unemployment allowance z. Thus, disposable income y^d is

$$y^d = c + i + g + z - t. \tag{3}$$

Consumption c depends on y^d and hence

$$c = c(y^d). \tag{4}$$

The value of the national product, denoted by y^v, is the sum total of consumption c, investment i and the value of the public works product θg where θ represents the efficiency rate of g. Thus, y^v is given by

$$y^v = c + i + \theta g. \tag{5}$$

Note that θ equals zero if the public works is useless.

From (2), (3) and (4) one has

$$y^d = c(y^d) + i,$$

showing that neither z nor g has any effect on disposable income y^d:

$$dy^d/dg = 0, \quad dy^d/dz = 0. \tag{6}$$

Since (2), (3) and (5) imply

$$y^v - \theta g = y^d,$$

from (4) and (5) y^v satisfies

$$y^v = c(y^v - \theta g) + i + \theta g.$$

From this equation one finds

$$dy^v/dg = \theta, \quad dy^v/dz = 0. \tag{7}$$

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Equations (6) and (7) imply proposition 2. In particular, if the project is of no use (i.e., $\theta = 0$), it affects neither disposable income y^d nor national product y^y and hence is equivalent to unemployment relief expenditure, as stated in proposition 1.

The first equation of (7) shows that a public works project is worth carrying out as long as the value of its product is positive ($\theta > 0$). Note that it is still true even if the value is less than the expenditure ($\theta < 1$). It is in sharp contrast to the neoclassical case --i.e., under full employment if θ is less than 1, the public works project reduces the national product since its spending exactly exhibits its opportunity cost. In the presence of unemployment, in contrast, it is not an opportunity cost but a costless transfer since the workers should be unemployed without it.

3. Conclusion: The Present National Income Accounting May Mislead Policy Decision

In standard textbooks it is taught that in the presence of unemployment public works raises the national income by creating new demand whereas unemployment relief expenditure does not since it is a mere redistribution. Since this property is independent of what is produced by public works, even useless public works is believed to be better than unemployment relief expenditure. This note shows that it is a fallacy and that such public works is equivalent to unemployment relief expenditure whether the rational consumer behavior or the Keynesian consumption function is assumed.

The fallacy comes from a confusion between the spending and the produced value of public works, and the present national income accounting is also distorted by the confusion. In the present national accounting if a government collects money under the name of unemployment insurance premium and transfers it to the unemployed as unemployment allowance, it adds nothing to the national income. However, if it collects money under the name of tax payment and transfers it as payroll for public works, the amount is added to the national income. Thus, the level of the multiplier calculated under the present national income accounting is meaningless when considering the national product. It is because the present accounting implicitly assumes that the value of public works equals its cost. In reality, however, useless public works is a mere redistribution and equivalent to unemployment relief expenditure. Therefore, public works must be evaluated as the value of its product in the national income accounting.

Such a correction can also apply to the case of full employment. An increase in public works crowds out private usage of production factors and increases the national product by the value of its product. In the present accounting system public works is evaluated not by the value of its product but by the expenditure level and hence the national product does not vary even if it is of no use. If it is evaluated by the value of its product (which is zero in the present case), however, the national product decreases by the expenditure level, showing correctly the crowding-out effect.

Finally, it is to be noted that the results obtained under a balanced budget can also apply to the case of loan expenditure if the intertemporal budget equation is taken into account. It is because the Ricardian equivalence holds and hence there is no difference between balanced-budget expenditure and loan expenditure. Thus, any property based on the multiplier effect is a fallacy even in the presence of unemployment. Nevertheless, public works of some use is worth doing even if the value of its product is less than the expenditure.

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