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Government Spending and the Income-Expenditure Model: The Multiplier, Spending Composition, and Job Guarantee Programs

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GOVERNMENT SPENDING AND THE INCOME-EXPENDITURE MODEL: THE MULTIPLIER, SPENDING COMPOSITION, AND JOB GUARANTEE PROGRAMS

Thomas Palley*

ABSTRACT

This paper reconstructs the income – expenditure (IE) model to include a distinction between government purchases of output versus government production. The distinction has important consequences for output and employment multipliers. The paper also extends the IE model to incorporate a government job guarantee program (JGP), and the extended model illuminates the automatic stabilizer properties of a JGP. The model is then extended to include Kaleckian income distribution effects. That generates a novel Kaleckian balanced budget multiplier driven by changed composition of government spending. The paper concludes with some economic and political economy concerns about a JGP that are flagged by the model.

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Government Spending and the Income-Expenditure Model: The Multiplier, Spending Composition, and Job Guarantee Programs

Abstract

This paper reconstructs the income – expenditure (IE) model to include a distinction between government purchases of output versus government production. The distinction has important consequences for output and employment multipliers. The paper also extends the IE model to incorporate a government job guarantee program (JGP), and the extended model illuminates the automatic stabilizer properties of a JGP. The model is then extended to include Kaleckian income distribution effects. That generates a novel Kaleckian balanced budget multiplier driven by changed composition of government spending. The paper concludes with some economic and political economy concerns about a JGP that are flagged by the model.

Keywords: Government spending, spending composition, balanced budget multiplier, job guarantee program

JEL ref.: E10, E12, E62.

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1. Introduction: rethinking the macroeconomics of government spending

In the wake of the Great Recession of 2008-09 there has been significantly revived interest in the power of fiscal policy and the size of the government spending multiplier. Keynesian thinking about the macroeconomic impact of government spending is substantially captured by Samuelson's (1948) seminal income-expenditure (IE) model, which is represented by the Keynesian cross diagram. This paper revisits the IE model and introduces a distinction between government purchases of private sector output (e.g. military equipment) versus government produced services (e.g. education and municipal services). That is an important distinction with macroeconomic consequences which have been substantially over-looked.

Additionally, the paper extends the IE model to examine the macroeconomic

implications of a government job guarantee program (JGP) aimed at delivering permanent full employment. Prompted by the slow imperfect employment recovery after the Great Recession, that policy idea has recently become the subject of considerable interest (see Paul et al., 2018; Wray et al., 2018).

Government spending and employment constitute significant shares of output and employment in modern economies, yet their treatment within existing macroeconomic models does not capture their reality. The models developed in this paper help remedy that and shed light on policy implications associated with government production and employment programs. The Kaleckian version of the reconstructed IE model generates two different government spending multipliers, one for purchases of private sector output and one for public sector produced output. The latter is larger, which generates a novel Kaleckian balanced budget multiplier based on changing the composition of government spending.¹ The reconstructed model also highlights the difficulty associated with measuring public sector output. Lastly, the paper concludes with some macroeconomic, microeconomic, and political economy concerns about a government JGP.

2. The Keynesian IE model

The benchmark starting point is the standard Keynesian IE model (Samuelson, 1948)

given by

$$(1) Y = D$$

$$(2) D = C + I + G$$

$$(3) C = A + b[1 - t][y + T] \qquad 0 < b < 1, 0 < t < 1$$

$$(4) I = I'$$

¹ The original balanced budget multiplier was introduced by Samuelson (1948) and rests on the differential aggregate demand impact of increased government spending and increased taxes.

$$(5) G = G'$$

$$(6) Y = aN \quad a > 0, N \leq N^F$$

$$(7) p = [1 + m]w/a$$

Y = output, D = aggregate demand (AD), C = consumption spending, I = investment spending, G = government spending, A = autonomous consumption spending, b = propensity to consume, t = income tax rate, T = transfers, a = labor productivity, N = employment, N^F = labor supply, p = price level, m = mark-up, w = private sector wage. All quantity variables are in real terms. Investment and government spending are exogenously given.

Equation (1) is the goods market equilibrium condition. Equation (2) is the definition of AD. Equation (3) is the consumption function.² Equation (6) is the aggregate production function. Equation (7) determines the price level and has firms charging a mark-up over unit labor costs.

Solving the model yields the following solutions for output and employment:

$$(8) Y^* = \{A + b[1 - t]T + I' + G'\} / \{1 - b[1 - t]\}$$

$$(9) N^* = Y^* / a$$

The government spending output and employment multipliers are

$$e_{y,G} = 1 / \{1 - b[1 - t]\}$$

$$e_{N,G} = 1/a \{1 - b[1 - t]\}$$

The transfer spending output and employment multipliers are

$$e_{y,T} = b[1 - t] / \{1 - b[1 - t]\} > 0$$

$$e_{N,T} = b[1 - t] / a \{1 - b[1 - t]\} > 0$$

² The specification of the consumption function has transfer payments being subject to income tax, but this need not be the case.

The transfer spending multipliers are smaller than the government spending multipliers. That is because transfer spending only impacts output and employment indirectly via consumption spending, whereas government spending adds directly to demand for private sector output which immediately spurs private sector production and employment.

3. The Keynesian IE model with a government sector

The standard IE model has government purchases of private sector output (e.g. military equipment purchases) but it makes no mention of government production. Consequently, it is silent on the economics and policy implications of such production.

Introducing government production requires changing the definition of national income and the goods market clearing condition, which subtly changes the structure and logic of the model. The new structural equations are given by:

$$(10) Y = Y_P + Y_G$$

$$(11) N = N_P + N_G$$

$$(12) Y_P = D$$

$$(13) G = G_P + G_G$$

$$(14) D = C + I + G_P$$

$$(15) Y_G = w_G N_G / p = \omega_G N_G$$

Y = aggregate output, Y_P = private sector output, Y_G = government output, N_P = private sector employment, N_G = government employment, G = total government spending, G_P = government spending on private sector output, $G_G = G_G$ = government spending on government produced output, w_G = government sector nominal wage, ω_G = government sector real wage.

Equation (10) redefines aggregate output to include both private sector and

government sector production. Equation (11) is the definition of aggregate employment, which consists of private sector and government sector employment. Equation (12) is the private sector goods market clearing condition which requires private sector output equal demand for private sector output. Equation (13) has total government spending equal government spending on private sector goods plus spending on public sector production. Equation (14) defines private sector demand. The government contribution to private sector demand is equal to government spending on private sector goods. Lastly, equation (15) determines the value of public sector output which is equal to the public sector wage bill. Initially, it is assumed the public sector wage equals the private sector wage so that $w_G = w_P$

There are three features of the model that are noteworthy. First, there is a standalone private sector goods market condition which is distinct from the national income identity. Goods market clearing requires private sector goods demand equal private sector output. In effect, the model is a two sector model. Private sector output is constrained by demand for private sector output, while public sector output is constrained by government spending on public production (i.e. public employment).

Second, the contribution of the government sector to national output is the value of the public sector wage bill. That reflects the fact that public sector output is not sold and is therefore valued at cost, which supposedly reflects the implicit market value of its output. The implication is increasing government wages and holding government employment constant, increases government output. That shows the difficulty of measuring government production.

Third, government production also changes the consumption function which is

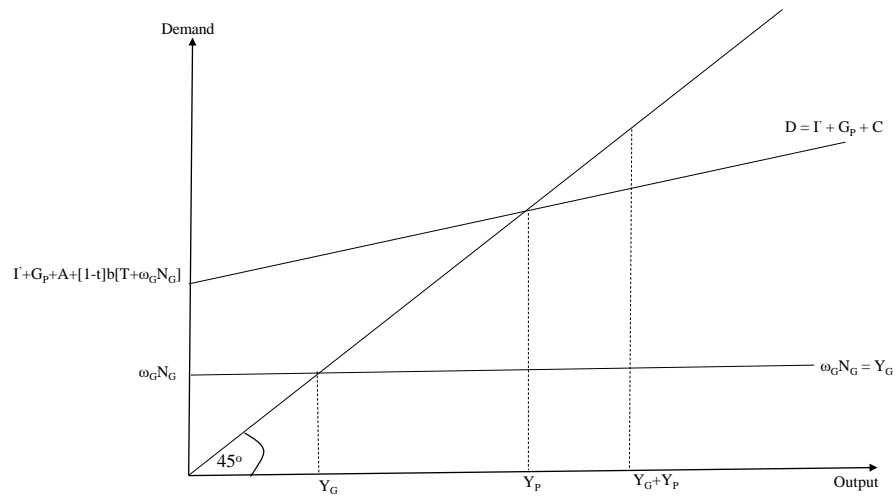
given by

$$(16) C = A + b[1 - t][y + \omega_G N_G + T] \quad 0 < b < 1, 0 < t < 1$$

The new feature is that households also receive the public sector wage bill as income.

Figure 1 is an amended Keynesian cross diagram and it shows the determination of public sector output, private sector output, and aggregate output. Public sector output (Y_G) is equal to spending on public sector production ($\omega_G N_G$). Private sector output (Y_P) is equal to the demand for private sector output (D). Note, spending on public sector production stimulates private sector demand since it generates wage income that worker households then spend on private sector produced goods.

Figure 1. The determination of public sector output, private sector output, and aggregate output.



The solutions for output and employment are given by:

$$(17) Y_P^* = \{A + b[1 - t][T + G_G] + I' + G_P\} / \{1 - b[1 - t]\}$$

$$(18) N_P^* = Y^* / a$$

$$(19) Y_G^* = G_G$$

$$(20) N_G^* = G_G/\omega_G$$

With regard to government spending, there are three experiments: an increase in transfer payments (T), an increase in government procurement from the private sector (G_P) holding public production constant, and an increase in public sector production (G_G) holding government private sector procurement constant.

Additionally, suppose government spending is allocated across public production and private sector procurement as follows

$$(21) G_P = \alpha G' \quad 0 \leq \alpha \leq 1$$

$$(22) G_G = [1 - \alpha]G'$$

α = share of government spending devoted to private procurement. In that case there is a fourth experiment involving reallocation of government spending from public production to private sector procurement. The first three experiments involve an increase in total government outlays ($T + G$), while the fourth holds outlays constant.

The total output and total employment multipliers are as follows:

$$e_{y,T} = b[1 - t]/\{1 - b[1 - t]\} > 0$$

$$e_{y,GP} = 1/\{1 - b[1 - t]\} > 0$$

$$e_{y,GG} = 1/\{1 - b[1 - t]\} > 0$$

$$e_{y,\alpha} = 0$$

$$e_{N,T} = b[1 - t]/a\{1 - b[1 - t]\} > 0$$

$$e_{N,GP} = 1/a\{1 - b[1 - t]\} > 0$$

$$e_{N,GG} = 1/\omega_G + b[1 - t]/a\{1 - b[1 - t]\} > 0$$

$$e_{N,\alpha} = 1/a - 1/\omega_G < 0$$

The multipliers can be ranked as follows:

$$e_{y,GP} = e_{y,GG} > e_{y,T} > e_{y,\alpha} = 0$$

$$e_{N,GG} > e_{N,GP} > e_{N,T} > 0 > e_{N,\alpha}$$

The multipliers for transfer payments ($e_{y,T}$) and government purchases of private sector produced goods ($e_{y,GP}$) are exactly as in the standard IE model. The private sector government procurement multiplier is larger than the transfer payment multiplier because the economic impact of transfer payments is diminished by households saving part of the transfer. The output multipliers from increased public sector production ($e_{y,GG}$) and increased government procurement of private sector production are the same size. In the Keynesian IE model reallocation of government spending has no impact on GDP.

The ranking of employment multipliers is more complex. The employment multiplier from increased transfer payments ($e_{N,T}$) and increased government purchases of private sector output ($e_{N,GP}$) are the same as in the standard IE model. However, the employment impact from spending on government production is different and larger. The first dollar of spending in the private sector creates $1/a$ jobs. The first dollar of spending in the government sector creates $1/\omega_G$ jobs. Substituting for the government real wage yields $[1 + m]w/aw_G$. Using the assumption that $w_G = w$, this implies $[1 + m]/a > 1/a$.

The reason the government production employment multiplier is larger is that there is no profit mark-up (m) on government production so that every dollar spent goes to hire additional workers. In contrast, part of each dollar spent on private sector production is drained off as profit rather than creating employment. That explains why public works spending has a larger employment impact than spending on purchases of military equipment which carry a high profit mark-up.

This employment creation advantage diminishes and eventually reverses as the

ratio of the government nominal wage to the private sector wage increases (w_G/w). That is because a higher government sector wage means each dollar spent on government production generates less government employment. The condition for reversal is $[1 + m]w/aw_G < 1/a$, which implies the condition $w_G/w > 1 + m$. If government pays a real wage premium that exceeds the mark-up, the public production employment multiplier becomes smaller than the private goods procurement multiplier.

Lastly, the private sector mark-up helps explain why corporations are so keen to privatize the provision of government services. The aim is to turn government into a corporate profit center (Palley, 2018) by earning a profit margin on production that was previously undertaken by government without such a margin.

4. The Keynesian IE model with a job guarantee program (JGP)

The augmented model can now be further expanded to incorporate a government JGP. Such employment programs are intended to ensure full employment by making a job available to anyone who wants one. They do so by creating a lower class of government job with a nominal wage (w_J) that is less than the standard government job nominal wage (w_G) so that $w_G > w_J$.

A job guarantee program can be readily incorporated by adding a fixed labor supply (L). The allocation of employment is given by

$$(23) L = N_P + N_G + N_J$$

N_J = employment in job guarantee programs.

The specification of household consumption is also changed to

$$(24) C = A + b[1 - t][Y + \omega_G N_G + \omega_J N_J + T]$$

ω_J = job guarantee real wage. Household consumption is therefore augmented by wage

income under the job guarantee program.

The model can then be reduced to a three equation system given by

$$(25) N_G = G_G/\omega_G$$

$$(26) N_J = L - N_P - N_G$$

$$(27) N_P = Y_P/a = \{A + b[1 - t][T + G_G + \omega_J N_J] + I' + G_P\}/a\{1 - b[1 - t]\}$$

Equation (25) has regular government employment (N_G) determined by government spending on public production (G_G) and the standard government wage job. Employment in the private sector and job guarantee programs is then set by the state of aggregate demand, which is impacted by both government spending and the job guarantee wage (ω_J). Equation (26) determines the level of guaranteed employment which is a negative function of private and public sector employment. Equation (27) determines the level of private sector employment, which depends on the level of AD. The level of AD is positively impacted by spending on public sector production (G_G), government spending on private sector goods (G_P), and spending on guaranteed employment jobs ($\omega_J N_J$).

The solution of the model is illustrated in Figure 2. The negatively sloped line represents job guarantee employment. As private sector employment increases, it draws workers out of job guarantee employment. At the microeconomic level, a necessary condition for this is $w > w_J$ so that private sector jobs pay more than guaranteed employment jobs. The positively sloped line has private sector employment being a positive function of employment in guaranteed jobs. That is because guaranteed jobs pay a wage, and households then spend that wage income on private sector produced goods which increases AD and employment in the private sector.

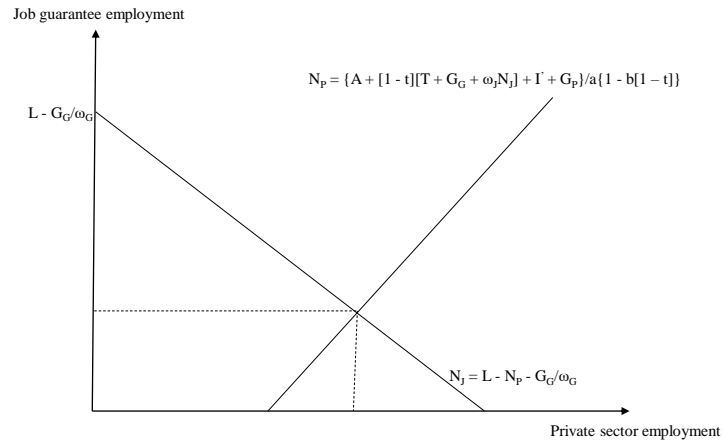
The slopes of the two lines are:

$$dN_J/dN_P|_{N_J} = -1 < 0$$

$$dN_J/dN_P|_{N_P} = a\{1 - b[1 - t]\}/b[1 - t]\omega_J > 0$$

An increase in labor productivity (a) steepens the slope of the private sector employment function as additional guaranteed jobs now create fewer private sector jobs. The reason is the additional AD created by guaranteed jobs results in lower private sector job creation owing to the increased productivity of private sector workers. An increase in the guaranteed job wage (ω_J) flattens the slope so that every guaranteed job creates more private sector jobs. The reason is guaranteed job pays a higher wage, which means guaranteed jobs have a larger impact on AD and private sector labor demand. The same holds for increases in the propensity to consume (b). Lastly, a higher tax rate (t) steepens the slope by reducing the AD impact of guaranteed jobs.

Figure 2. The determination of private sector and job guarantee employment.



The comparative statics are shown in Table 1. The basic logic is that expansionary fiscal policy shifts the private sector employment function right, and may also change its

slope for reasons discussed above. An increase in labor supply shifts the guaranteed employment function up. An increase in public sector employment shifts it down (but also shifts the private sector employment function right). An important feature of Table 1 is that total employment is always constant since the economy is at full employment. In effect, all who would otherwise be unemployed now have guaranteed employment jobs. Expansionary fiscal policy or other expansionary AD developments therefore change the composition of employment, shifting workers out of guaranteed employment jobs into private and public sector employment.

Table 1. Employment comparative statics of the model with guaranteed employment.

	$\frac{dw_G > 0}{(dG_G > 0)}$	$\frac{dw_G > 0}{(dG_G = 0)}$	$\frac{dG_G > 0}{(dw_G = 0)}$	$dw_J > 0$	$dG_P > 0$	$dT > 0$	$dt > 0$	dA	db	da
dN_G	0	-	+	0	0	0	0	0	0	0
dN_J	-	?	-	-	-	-	+	-	-	+
dN_P	+	+	+	+	+	+	-	+	+	-
$dN_G + dN_J + dN_P$	0	0	0	0	0	0	0	0	0	0

A similar exercise can be conducted for output, and the model can also be represented in private sector output (Y_P) – job guarantee output (Y_J) space. There are now three types of output in the economy: output produced in the private sector, output produced in the public sector, and output produced in the job guarantee sector.

$$(28) Y = Y_P + Y_G + Y_J$$

$$(29) Y_G = G_G/p = \omega_G N_G$$

$$(30) Y_J = \omega_J N_J$$

Job guarantee output is accounted for in the national income accounts in exactly the same way as public sector output, and is equal to the wage bill (i.e. the cost of inputs). In contrast, unemployment benefit payments are accounted for as a transfer payment to households and do not add to national income. The justification for the difference in treatment is that job guarantee payments are claimed to generate services for society equal to the value of the payments.

Table 2 shows the comparative statics for output effects. Even though total employment is unchanged, output can increase. The reason is employment is shifted from the low wage guaranteed employment sector to the higher wage public and private sectors. The one exception to this is a positive productivity shock ($da > 0$) for which the employment shifts are in a different direction yet output still increases. Initially, the productivity shock lowers private sector employment while leaving private sector output unchanged because AD is unchanged. With unchanged AD, higher worker productivity requires fewer workers to meet demand. However, laid off private sector workers then move into guaranteed employment jobs, which provides a fiscal stimulus to AD via their wages. That increases output in the private sector and also recovers some of the private sector jobs that were initially lost.

Table 2. Output comparative statics of the model with guaranteed employment.

	$\frac{dw_G > 0}{(dG_G > 0)}$	$\frac{dw_G > 0}{(dG_G = 0)}$	$\frac{dG_G > 0}{(dw_G = 0)}$	$\frac{dw_J > 0}{0}$	$\frac{dG_P > 0}{0}$	$\frac{dT > 0}{0}$	$dt > 0$	dA	db	da
dY_G	+	0	+	0	0	0	0	0	0	0
dY_J	-	+	-	+	-	-	+	-	-	+
dY_P	+	+	+	+	+	+	-	+	+	+
$dY_G + dY_J + dY_P$	+	+	+	+	+	+	-	+	+	+

Lastly, an important feature of a JGP is it acts as an automatic stabilizer. When private sector AD contracts, private sector workers are laid off. They move into the job guarantee sector and then spend their wages on private sector goods, thereby helping stimulate the private sector and diminishing the impact of the negative demand shock. The reverse happens with positive private sector AD shocks, with workers moving out of guaranteed employment to higher wage jobs in the private sector. That movement out of guaranteed jobs reduces the fiscal stimulus coming from the job guarantee sector, thereby automatically diminishing the impact of the positive demand shock.

5. The Kaleckian IE model

The Keynesian IE model makes no mention of income distribution, yet income distribution effects are important for the macroeconomic impact of both public sector production and job guarantee employment. First, both types of spending have higher

initial employment impacts than spending on private output because none of the spending is immediately drained off in the form of a price mark-up. Second, both types of spending generate income for worker households which have a higher propensity to consume, and that impacts their multipliers. These features suggest analyzing government spending in the Kaleckian IE model which does recognize the impact of income distribution.

The Kaleckian IE model requires specifying the functional distribution of income and re-specifying consumption behavior. A simple version is given by:

$$(31) s_{\pi} = m/[1 + m] \quad 0 \leq s_{\pi} < 1$$

$$(32) s_w = 1/[1 + m] \quad 0 < s_w \leq 1$$

$$(33) s_{\pi} + s_w = 1$$

$$(34) C = C_K + C_W$$

$$(35) C_K = b_K[1 - t][s_{\pi}Y] \quad 0 < b_K \leq 1$$

$$(36) C_W = [1 - t][s_wY + T]$$

w = nominal wage, s_{π} = profit share, s_w = wage share, C_K = capitalist household consumption, C_W = worker household consumption.

Equations (31) and (32) determine the profit and wage share respectively, while equation (33) is the national income adding-up constraint.³ Equation (34) defines aggregate consumption, which consists of consumption of capitalist and worker households. Equation (35) determines capitalist household consumption, with b_K being capitalist households' propensity to consume. Capitalist households are assumed to receive all profit income and no wage income. Equation (36) determines worker

³ The expressions for the profit and wage share are obtained from the expressions for profits and the wage bill. Profits are given by $\Pi = Y - wN/p$. The wage bill is given by $W = wN/p$. Combining these expressions with the expressions for the production function and the price level, enables solution for the profit and wage share expressions.

household consumption, and worker households have a propensity to consume of unity (i.e. save nothing). Worker households are assumed to receive all wage income and no profit income. They are also assumed to receive all government transfer payments.

Replacing equation (3) in the standard Keynesian IE model with equations (34) – (36) and solving, yields solutions for output and employment given by:

$$(37) Y^* = \{[1 - t]T + I' + G'\} / \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\}$$

$$(38) N^* = Y^* / a$$

The government spending output and employment multipliers are:

$$e_{y,G} = 1 / \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} > 0$$

$$e_{N,G} = 1/a \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} > 0$$

The transfer spending output and employment multipliers are:

$$e_{y,T} = [1 - t] / \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} > 0$$

$$e_{N,T} = [1 - t] / a \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} > 0$$

The critical feature of the Kaleckian model is that it introduces income distribution into the analysis. Income distribution matters for AD because worker and capitalist households have different propensities to consume.⁴ Increases in the wage share increase AD, output, and employment because worker households have higher propensity to consume than capitalist households. The reverse holds for increases in the profit share. Whereas the mark-up has no AD effect in the standard Keynesian IE model, it becomes a critical variable in the Kaleckian model as it determines the profit and wage shares, which determine how income is channeled to different household types.

⁴ In the current model income distribution is restricted to impact consumption spending. In fuller models it also impacts investment spending. Those effects are excluded in the current analysis because they add nothing regarding the issue being examined. Increases in the wage share increase AD, output, and employment because worker households have higher propensity to consume than capitalist households.

6. The Kaleckian IE model with government purchases and production

Government production can be added to the standard Kaleckian IE model by using the equations of the Keynesian IE model with government production (equations (4) – (7) and (10) – (15)) and re-specifying aggregate consumption as follows:

$$(39) C = C_K + C_W$$

$$(40) C_K = b_K[1 - t][s_\pi Y] \quad 0 < b_K < 1$$

$$(41) C_W = [1 - t][s_w Y + \omega_G N_G + T]$$

The determinants of capitalist household consumption are unchanged. However, worker households receive the public sector wage bill. The solutions for output and employment are given by:

$$(42) Y_P^* = \{[1 - t][T + G_G] + I' + G_P\} / \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\}$$

$$(43) N_P^* = Y^*/a$$

$$(44) Y_G^* = G_G$$

$$(45) N_G^* = G_G/\omega_G$$

$$(46) G_P = \alpha G'$$

$$(47) G_G = [1 - \alpha]G'$$

The graphical solution of the model is identical to that shown in Figure 1.

However, the slope of the private sector AD function is now impacted by the distribution of income, with the slope being a positive function of the wage share. Analytically, the expenditure multiplier is a positive function of the wage share. A higher wage share, means a higher proportion of income goes to worker households which have a higher propensity to consume. Consequently, increases in income generate a larger induced increase in AD, which generates a larger induced increase in income.

As before, there are four fiscal policy experiments: an increase in transfer (T), an increase in private sector procurement (G_P) holding public production constant, increase in public sector production (G_G) holding private sector procurement constant, and a reallocation of government spending from public production to private sector procurement (α). The first three experiments involve an increase in total government outlays ($T + G$), while the fourth holds outlays constant.

The total output and total employment multipliers are as follows:

$$e_{y,T} = [1 - t] / \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} > 0$$

$$e_{y,GP} = 1 / \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} > 0$$

$$e_{y,GG} = 1 + [1 - t] / \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} > 0$$

$$e_{y,\alpha} = \{-1 + t / [1 - b_K[1 - t]s_\pi - [1 - t]s_w]\} G' < 0$$

$$e_{N,T} = [1 - t] / a \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} > 0$$

$$e_{N,GP} = 1/a \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} > 0$$

$$e_{N,GG} = 1/\omega_G + [1 - t] / a \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} > 0$$

$$e_{N,\alpha} = -1/\omega_G + t/a \{1 - b_K[1 - t]s_\pi - [1 - t]s_w\} < 0$$

The multipliers can be ranked as follows:

$$e_{y,GG} > e_{y,GP} > e_{y,T} > 0 > e_{y,\alpha}$$

$$e_{N,GG} > e_{N,GP} > e_{N,T} > 0 > e_{N,\alpha}$$

The signings of the multipliers is the same as in the Keynesian IE model with production, but their relative size changes. In the Keynesian IE model increases in government procurement (G_P) and government production (G_G) have the same output multiplier ($e_{y,GP} = e_{y,GG}$), whereas in the Kaleckian model the procurement multiplier is smaller than the production multiplier ($e_{y,GP} < e_{y,GG}$). The reason is the introduction of

income distribution effects in AD. Now, the second round induced consumption spending effect on AD is larger for government production than for government procurement. That is because increases in government production generate pure wage income, all of which goes to worker households which have a higher propensity to consume. In contrast, part of procurement spending goes to capitalist households in the form of profit share, and they have a lower propensity to consume. Consequently, procurement spending generates less induced consumption spending, resulting in less induced income generation.

The difference in the size of the multipliers depends positively on the size of the mark-up and positively on the absolute difference in the propensities to consume of capitalist and worker households. In concrete terms, in the Kaleckian model, there is a greater output expansion benefit from spending on public production (e.g. municipal services) than from purchases of private sector output (e.g. military hardware) which are subject to a profit mark-up. That mark-up reduces AD because profit income accrues to capitalist households which have a lower propensity to consume.

That logic also explains why the output multiplier from a redistribution of government spending toward private sector procurement is negative ($e_{y,\alpha} < 0$). In the Kaleckian model, redistributing government spending toward government production generates a novel Kaleckian form of balanced budget multiplier. Total spending is unchanged, but output increases due to the changed composition of government spending.

Compared to the Keynesian IE model, the Kaleckian employment multiplier from increased spending on government production is now even larger than that from increased spending on government procurement. That is because of the additional

positive employment effects from greater induced private sector output expansion. As before the size of the difference in the employment multipliers depends on the mark-up (m), the relative private and government sector wage (w/w_G), and private sector labor productivity (a). A higher mark-up, a higher private sector wage, and higher private sector labor productivity all reduce the procurement employment multiplier relative to the government production employment multiplier.

7. The Kaleckian IE model with a job guarantee program

The Kaleckian IE model can also be expanded to incorporate government job guarantee programs. As in the Keynesian IE model, this requires adding a labor supply constraint (see equation (23)) that determines the allocation of employment across the private sector, government production, and guaranteed employment jobs. Additionally, the specification of worker household consumption becomes

$$(48) C_W = [1 - t][s_w Y + \omega_G N_G + \omega_J N_J + T]$$

Worker household consumption is therefore augmented by wage income under the job guarantee program ($\omega_J N_J$).

The Kaleckian IE model can then be reduced to a three equation system given by

$$(49) N_G = G_G / \omega_G$$

$$(50) N_J = L - N_P - N_G$$

$$(51) N_P = Y_P / a = \{ [1 - t][T + G_G + \omega_J N_J] + I' + G_P \} / \{ 1 - b_K [1 - t] s_\pi - [1 - t] s_w \}$$

Graphically, the solution of the Kaleckian model is the same as in Figure 2. Analytically, the only difference is that the slope of the private sector employment function is affected by the distribution of income and the propensities to consume of capitalist and worker households. The greater the wage share, the flatter the slope so that private sector

employment and output are larger for a given level of guaranteed employment.

Lastly, in the Kaleckian model an employment guarantee program will be even more effective as a counter-cyclical stabilizer. That is because the program will generate additional counter-cyclical stabilizing movements in the distribution of income. Thus, given a negative shock to private sector AD which lowers private sector employment and output, workers shift into guaranteed jobs where they receive a larger share of the value of output (one hundred percent). Consequently, the worker share of aggregate income rises, further increasing AD and strengthening the counter-response to the initial negative demand shock.

8. Conclusion: some economic and political economy concerns regarding JGPs

The above Keynesian and Kaleckian IE models help understand the macroeconomics of a JGP. They also flag some potential economic and political economy concerns. The starting point is recognition that a JGP delivers multiple benefits. First, it ensures full employment by making available a job to all who want one on the terms specified by the program. Second, it substitutes wages for welfare benefits to workers who accept such jobs and would otherwise be on welfare. Third, it may deliver supply-side benefits to the extent that it helps unemployed workers retain job skills and avoid becoming detached from the labor force during periods of unemployment. Fourth, society benefits from the services produced by workers holding guaranteed employment jobs. Fifth, it has significant desirable counter-cyclical stabilization properties.

The second point is that a JGP is, in principle, compatible with and complementary to other policies that deliver some of the same benefits. However, it is tempting for both proponents and critics to set up false oppositions in the name of

advancing their preferred policy agendas. That said, a JGP program generates some policy conflicts and it also has some drawbacks. Those conflicts and drawbacks concern macroeconomics, microeconomics, and political economy.

A first macroeconomic concern is the putative cost of a JGP. This is a complex multifaceted concern that raises issues far beyond the confines of the current paper, but it is worth briefly registering. The immediate cost of a JGP will depend on the state of the economy and the state of the AD generation process. An economy with a deteriorated AD generation process, marked by a reduced wage share and increased inequality, will be prone to higher unemployment that raises the program's cost. That speaks to the need to pair a JGP with other structural Keynesian policies that remedy the causes of AD weakness.

The cost will also be mitigated to the extent that a JGP stimulates economic activity that generates tax revenues. However, those induced revenues will not pay for the program.⁵ Additionally, the cost will be reduced to the extent that JGP workers come off publicly financed welfare programs, thereby reducing the cost of the latter programs.

A second macroeconomic issue concerns financing and policy trade-offs. If government is financially constrained, policy must operate in a realm of trade-offs. Consequently, adopting a JGP may require giving up other desirable but costly policy proposals such as increased public infrastructure investment, expanded subsidized healthcare, covering the shortfall in Social Security via general revenues, free tertiary education at public universities, elimination of student debt, or a universal basic income (UBI).

⁵ In the simple Keynesian IE model the impact of a dollar of spending on the government deficit (D) is always positive and given by $dD/dG = 1 - t / \{1 - b[1 - t]\} > 0$.

This effect of financial constraints on government explains why discussion of a JGP tends to quickly spill over into a broader discussion about the macroeconomics of public finance. JGP proponents tend to believe government is financially unconstrained and can pay for everything by printing money. After the fact, government can then readily withdraw the money it has printed by raising taxes. All of this can be done without causing financial, economic, or political disruptions or distortions. That view is identified with modern money theory (see Tymoigne and Wray, 2015), which dismisses financial constraints on policy and argues the only constraint is availability of real resources (i.e. unemployed workers or under-utilized capital).

In contrast, more conventional public finance macroeconomics argues history, the economic situation, markets, and political process impose financial, economic, and political constraints on governments that are difficult to thread (see Palley, 2015a, 2015b). Though government has the technical ability to pay for everything owing to its power to issue money, doing so in excessive fashion will provoke disruptive and distorting financial, economic, and political reactions. The possibility of such reactions renders government's technical ability to pay for everything an economic will-o-the-wisp. A government with a short time horizon can use its printing power to finance all its policy desires, but subsequent market reactions to budget excess will impose costs and may make the policies unsustainable. Alternatively, a government with a longer time horizon takes such future reactions into account when setting current policy, making it *de facto* financially constrained despite the appearance of being unconstrained.

A third macroeconomic concern is inflation. The JGP wage is a real wage, which means the JGP nominal wage must be tied to inflation. Private sector nominal wages are

then likely be tied to the JGP nominal wage to maintain an appropriate wage differential. Consequently, the JGP nominal wage could start to act as a form of economy-wide nominal wage indexation. Such indexation could potentially generate an unstable wage – price spiral, particularly if the existence of a JGP aggravates distributional conflict by increasing private sector wage demands. Raising the private sector wage share may be a desirable feature, but it points to need for additional macroeconomic stabilization policy tools. That requirement is either ignored or denied by JGP proponents.

As regards microeconomics, there is concern related to the minimum wage aspect of a JGP. A necessary condition for the program to work is workers be willing to move from guaranteed jobs to private sector jobs when the latter become available. That requires the utility derived from a private sector job exceed that of a guaranteed employment job. The utility depends on the job package consisting of wage, benefits, and work conditions. In effect, a JGP would set a floor for employment conditions in the private sector, akin to a minimum wage, only broader. If the guaranteed employment job package is more attractive than the private sector job package, that will attract workers out of the private sector, lowering private sector output and employment. In that case, private sector employers may respond by improving their job package, which could have effects akin to a high minimum wage that prices low productivity workers out of employment.

Lastly, there are significant political economy concerns. A first such concern is the impact of a JGP on public sector unions (Palley, 2001). The distinction between government sector employment and guaranteed employment is artefactual, and both contribute to national income at cost. Consequently, there would likely be considerable

pressure to lower public sector wages and benefits to the level of the guaranteed job on grounds that the work is similar. In effect, there is a high risk that a JGP could be used to open a new front for undermining public sector unions and public sector remuneration.

A second political economy concern is workfare. Not only may the JGP be used to undermine the character of public sector employment, it can also be used to undermine the right to welfare. Thus, the right to welfare can be made conditional on accepting a guaranteed employment job. In this fashion, a JGP can become a double-edged sword, cutting upward against the public sector and downward against the welfare system. That is not an outlandish speculation in the context of US political economy, where the large prison population is already being exploited to work for near-free for the benefit of politically connected labor intensive private industry.

A third political economy concern is the productivity of guaranteed employment jobs. A JGP will be sold politically to the public on grounds that JGP workers are productive. However, delivering productivity requires organizational and managerial capacity that the public sector may not have. In that case, there is a risk that such jobs become perceived as “make work”. That would play into the political economy of animus to government, and it could boomerang back in the form of politics opposed to government provision of public goods and services and opposed to macroeconomic stabilization policy.

In sum, the debate over JGPs is fraught. Even those who support the aims of a JGP, and are favorably inclined to activist public policy, may still be wary of a JGP for economic and political economy reasons. Implementing a JGP will require political capital and the right political conditions. It might be better to use that favorable moment

to introduce new policies (e.g. a UBI) and upgrade a collection of existing different policy modalities that together deliver the same or more benefits without the political economy risks.

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