A NOTE ON GODLEY-LAVOIE’S
MACRO FRAMEWORK

Gérard DUMÉNIL and Dominique LÉVY
CNRS

E-mail: domi.levy@free.fr, gerard.dumenil@u-paris10.fr
Web Site: http://www.jourdan.ens.fr/levy/
This note is an introduction to Wynne Godley’s and Marc Lavoie’s (later GL) macroeconomics as in their 2007 book. The first two sections present three models built along the lines suggested by GL, though greatly simplified. A number of quotations have been collected in a third section, summarizing GL’s main findings. The ambition is to account for the basic properties put forward in the book. The purpose of this investigation is also to prepare a comparison with our own framework of analysis, introduced in earlier studies and on which we are presently working with the perspective of a forthcoming book on macroeconomics. But the present note does not develop this comparison. Only a number of basic principles are put forward in a short conclusion. The great merit of GL’s analysis is to show that traditional short-term effects cannot be extended to a long-term perspective.

Section 1 introduces a first model emblematic of GL’s framework. Two other auxiliary models are presented in Section 2. The main objective in this second section is to show that the findings in the previous section are preserved within more sophisticated frameworks. These models also illustrate the sort of investigation conducted by GL.

A central aspect of GL’s book is the reliance on transaction-flow matrices. There is no difficulty in this respect, and the models presented are all consistent with this type of accounting framework.

1 - GL’s basic model: Money-credit and government bonds

The emphasis is on two crucial mechanisms:

1. The determination of money and credit and, more generally, financial assets (such as bonds). The basic feature of GL’s analysis in this respect is that money and financial assets are determined by demand, while their supply is accommodative.

2. The role of the wealth effect in the consumption function of households.

1.1 General framework

In the three models in the present section (Section 1) and Section 2, two types of variables are considered, short-term and long-term variables. The difference lies in the speed of variation. In GL’s work, short-term variables are typically flows and, long-term variables, stocks. The variation of stocks is the effect of the in-going and out-going flows and, thus, stocks vary much slower than flows. For example, a stock of wealth is gradually affected by savings (possibly negative).

In a short-term equilibrium, long-term variables are given. (This is the method of temporary equilibrium.) Then, a sequence (the “traverse”) of short-term equilibria is considered to the point where long-term variables stabilize (or grow homothetically in a

growth model), that is, long-term equilibrium. (The stock of fixed capital is only considered
within growth models.)

In these models, money is created by: (1) credits granted to households, or (2) the
issuance of bonds by the government, purchased by the banking system. Money is destroyed
when banks sell bonds to households. Thus, the stock of money is equal to the sum of the
loans to households and the bonds held by banks.

Like GL, we first introduce behavioral equations. The short-term equilibrium is
then determined. The dynamics toward long-term equilibrium are finally studied. In a
model without growth, when such an equilibrium is reached, no flow modifies the value of
monetary-financial stocks. (In a growth model, flows and stocks grow at the same rate as
output.)

Concerning time subscripts, we use the same convention as GL. No subscript is written
for \( t \), and the subscript \(-1\) is written for the previous period.

1.2 The structure of the model

The model below is a simplified version of GL’s model in Chapter 4, but we also assume
that households can borrow from the banking system, whereas in GL’s models of Chapter
4 abstraction is made of this mechanism. Two assumptions are made: (1) A wealth effect
is introduced in the consumption function of households; and (2) the government finances
its deficit issuing bonds. The main result is that traditional Keynesian effects are produced
in the short run, but non-Keynesian effects are manifest in the long run.

Four agents are considered:

1. The government spends a given sum, \( G \), for consumption. Its revenue, \( T \), results from
taxation (a percentage of the total income of households). An interest rate \( i \) is paid on the
bonds previously issued by the government, for a total flow \( iB_{-1} \). The deficit is financed by
the issuance of new securities (bills or bonds, later “bonds”), a flow, \( \Delta B = G + iB_{-1} - T \).
One fraction is purchased by households and the rest by banks.

2. Households consume \( C \). They receive all income, \( Y \), emanating from production and the
flow of interest, \( iB_{-1}^h \), paid on the stock, \( B_{-1}^h \), of bonds they hold. Thus, their total pretax
income is \( Y + iB_{-1}^h \), on which they pay taxes at a rate \( \theta \), for a value \( T = \theta(Y + iB_{-1}^h) \).
Their available income (after-tax income) is therefore:

\[
Y^D = (1 - \theta)(Y + iB_{-1}^h)
\]  

The net wealth (assets minus liabilities), \( V \), of households is the sum of their stock of bonds and
their stock, \( M \), of money on their bank account, minus their debt:

\[
V = B^h + M
\]

A number of households have a debt \( L \). The net wealth (assets minus liabilities) of house-
holds is, therefore:

\[
V = B^h + M - L
\]

Their consumption is determined by the following function:

\[
C = \alpha^1 Y^D + \alpha^2 V_{-1}
\]
Their wealth is gradually formed by the accumulation of their savings $Y^D - C$:

$$V = V_{-1} + Y^D - C$$  \hfill (3)

The distribution between the two types of assets results from a choice of households. We assume here that they hold a given fraction, $\lambda$, of their total wealth as bonds, that is, $B^h = \lambda V$. The remainder, $M = (1 - \lambda)V$, is conserved as money on bank accounts. Thus, equation 1 can be written as:

$$Y^D = (1 - \theta)(Y + i\lambda V_{-1})$$  \hfill (4)

Since $\lambda$ is constant, the same relation links flows: $\Delta B^h = \lambda(Y^D - C)$. (Households use $\lambda\%$ of their savings to buy bonds.)

3. Enterprises produce the output $Y$, which is sold to the government and households:

$$Y = C + G$$  \hfill (5)

Total income is paid out to households as wages or profits.

4. Banks manage bank accounts, lend to households, and buy the bonds which have not been purchased by households. For simplicity, abstraction is made of the interest paid on the debt of households (paid to the shareholders of banks and, thus, returning to households). Also for simplicity, we assume that the interest paid by the government to banks returns to the government.

This framework corresponds to GL’s Table 4.2 (p. 101), given the obvious alteration of notation ($i$ instead of $r$). Figure 1 shows the three balance sheets in the traditional arrangement within French accounting (with own funds, equivalently net worth, at the top of the liability side, and debts in the lower part). (In GL’s Table 4.2, there is no debt of households.)

### Figure 1  The three balance sheets

\[
\begin{array}{c|c|c|c|c|c|c|c|c|c}
 & L & M & B^h & V & L & M & B^h & V^g & B \\
\hline
& & & & & & & & & \\
\hline
\text{Households} & & & & & & & & & \\
\text{Banks} & & & & & & & & & \\
\text{Government} & & & & & & & & & \\
\end{array}
\]

Since there is no fixed capital and all incomes are paid out, the balance sheet of enterprises is null and not represented. The net wealth of banks is null since no income is accumulated. The net wealth of the government is negative. Its sign has been changed to allow for its representation.

The total net wealth of all agents is necessarily null. Since the net wealth of enterprises and banks are null, the total net wealth in the economy is the sum of the net debt of households, $V$, and of the government, $V^g$. One, therefore, has: $V + V^g = 0$. Since the
only component of the balance sheet of the government is the amount of bonds, \( B \), one has:
\[ V^g = -B. \]
Thus:
\[ V = B \]  
(6)
The comparison of the three balance sheets in the diagram illustrates this equality.

1.3 The accomodative behavior of banks (or endogenous money)

The analysis in this section is based on Figure 2, a diagrammatic representation of matrices as in GL. We successively consider the consistency of financial flows for households and the government:

Figure 2 Monetary flows (purchasing powers)

The two arrows in boldface denote “balancing flows”.

1. The finances of households. They received \( Y \) and \( iB^h_{t-1} \), pay \( T \), purchase consumption goods, \( C \), and buy bonds for \( \Delta B^h = \lambda(Y_D - C) \). These two flows have no reason to be equal. The difference is expressed either in the variation of loans provided by banks or the variation of deposits, a first “balancing flow”.

2. The finances of the government. The government receives \( T \), \( iB^b \) (the interest paid back by banks), and the flow resulting from the purchase, \( \Delta B^h \), of bonds by households. It pays out, the sum of \( G \) and \( iB \). Again, these in-going and out-going flows have no reason to be equal. The bonds which are not purchased by households are bought by banks, a second balancing flow.

The two balancing flows can be determined. They are:
\[ \Delta(L-M) = T + C + \Delta B^h - (Y + iB^h) \]
\[ \Delta B^b = G + iB - (T + \Delta B^h + iB^b) \]

Given the assumption of short-term equilibrium, one has: \( Y = C + G \). It is easy to check that, as stated in the introduction, in such a situation the sum of the increase of the loans to households, \( \Delta L \), and the increase in the stock of bonds held by banks, \( \Delta B^b \) is equal to the increase of the money stock:
\[ \Delta L + \Delta B^b = \Delta M \]  
(7)
Two results follow: (1) The two balancing flows are equal with opposite signs; and (2) In a short-term equilibrium, the savings of households are equal to the deficit of the government. One can check that the savings of households are equal to the variation of their net wealth $\Delta(Bh + M - L)$. The deficit of the government is equal to its issuance of new bonds $\Delta B$. Equation 7 shows that these two amounts are equal.

The discussion about the accommodative behavior of banks or, equivalently, the endogenous character of money and finance hinges around the two balancing flows above. The crucial point is that these two flows are not directly determined by behaviors, but calculated in order to balance the accounts:

1. Concerning borrowers, households and the government, these flows are indirectly determined by their other behaviors. It appears that these agents finally need this financing, a residual.
2. Concerning lenders, that is, banks, their behaviors are not considered. Banks passively lend what is demanded. The demand for financing is accommodated.

1.4 Short-term equilibrium

The four equations, 2, 3, 4 and 5 define the model. In the analysis of short-term equilibrium stocks are considered given. In these equations, there is only one such stock, $V_{-1}$, the wealth of households. The short-term equilibrium is the solution to the three equations 4, 2 et 5:

$$
Y^* = G + (\alpha^2 + \lambda \alpha^1 (1 - \theta)) V_{-1}
$$

$$
C^* = Y^* - G = \frac{\alpha^1 (1 - \theta) G + (\alpha^2 + \lambda \alpha^1 (1 - \theta)) V_{-1}}{1 - \alpha^1 (1 - \theta)}
$$

One can check that, in a short-term equilibrium, the savings, $Y^D - C$, of households are equal to the deficit of the government $Def = G + i Bh_{-1} - T$.

In terms of comparative statics, the following properties of equilibrium hold. Equilibrium output, $Y^*$, is larger if: (1) government expenses are larger; (2) the interest rate is larger; and (3) the initial wealth of households is larger. For a Keynesian economist, the positive effect of a larger value of the rate of interest is paradoxical, but it can be easily understood in the context of the model. A rise in the interest rate has no negative effect on demand, but it increases the income of households and, consequently, also increases their demand.

1.5 The dynamics toward long-term equilibrium

Substituting its short-term equilibrium value, $Y^*$, for $Y$ in equation 3, this equation accounts for the dynamics of $V$ toward long-term equilibrium:

$$
V = V_{-1} \left(1 - \frac{\alpha^2 \theta - \lambda \theta (1 - \theta)(1 - \alpha^1)}{1 - \alpha^1 (1 - \theta)}\right) + G \frac{(1 - \theta)(1 - \alpha^1)}{1 - \alpha^1 (1 - \theta)}
$$

(8)
Long-term equilibrium is:

\[ V^{**} = G \frac{1}{\alpha^2 \frac{1}{1 - \alpha^1} \frac{1}{1 - \theta} - \lambda i} \]  

(9)

and

\[ Y^{**} = \lambda G \frac{1}{\alpha^2 \frac{1}{1 - \alpha^1} \frac{1}{1 - \theta} - \lambda i} \frac{1}{1 - \alpha^1} \frac{1}{1 - \theta} - \lambda i \]

The same approach as above, in terms of comparative statics, can be applied to the long-term equilibrium. The value of long-term equilibrium, \( Y^{**} \), is larger if the interest rate is larger. The value of \( Y^{**} \) is smaller if the tax rate, \( \theta \), is larger. Finally, \( Y^{**} \) is smaller if the parameters, \( \alpha_1 \) et \( \alpha_2 \), of the demand functions are larger.

Thus, approaching long-term equilibrium from a traditional Keynesian perspective, two paradoxical effects are observed: (1) the impact of the interest rate as in the case of the short-term equilibrium; and (2) the impacts of the parameters of the demand functions. If households consume more in the short run (an effect of the larger values of \( \alpha_1 \) or \( \alpha_2 \)), the position of the long-term equilibrium is lower. These two properties are consequences of the wealth effect.

Long-term equilibrium, \( Y^{**} \), is stable if:

\[ \alpha^1 + \frac{\alpha^2 \theta}{\lambda i (1 - \theta)} > 1 \]

The wealth effect is a necessary component of stability (if \( \alpha^2 = 0 \), the equilibrium is unstable). Parameter \( \alpha^2 \) must, even, be larger than a given value: \( \alpha^2 > \frac{\lambda i (1 - \theta)}{\theta (1 - \alpha^1)} \).

2 - Two auxiliary models

Two models are presented. In the first model, a behavior of the government is introduced, intending to balance the budget. The second model distinguishes between capitalists and wage-earners.

2.1 Endogenizing government expenses

This model is inspired by GL’s Section 5.9 (p. 160-162). The new point is that, if the government runs a deficit, \( \text{Def}_t \) in period \(-1\), expenses will be cut in the next period:

\[ G = G_{-1} - \beta \text{Def}_{-1} \]

Nothing is changed concerning short-term equilibrium, but two slow variables, \( V \) and \( G \), are now considered instead of one. A recursion with two variables will, therefore, account for the traverse to long-term equilibrium.
Concerning $V$, equation 3 is conserved, substituting the deficit of the government to the saving of households to which they are equal. The recursion is:

$$
V = V_{-1} + \text{Def} \\
G = G_{-1} - \beta \text{Def}_{-1}
$$

with:

$$
\text{Def} = G + iV_{-1} - T
$$

We define the auxiliary variable $Z$:

$$
Z = G + \beta V_{-1}
$$

One can check that $Z = Z_{-1}$. Thus, $Z$ is constant: $Z = Z_1 = G_1 - \beta V_0$. From equation 12, it follows that $G = Z - \beta V_{-1} = Z_1 - \beta V_{-1}$. This term can be substituted for $G$ in equation 11 and in the first of equations 10. One finds:

$$
V = V_{-1} \left( 1 - \frac{\alpha^2 \theta + (\beta - \lambda i)(1 - \theta)(1 - \alpha^1)}{1 - \alpha^1(1 - \theta)} \right) + Z_1 \frac{(1 - \theta)(1 - \alpha^1)}{1 - \alpha^1(1 - \theta)}
$$

Note that, if $\beta = 0$, equation 8 is recovered.

There is a continuum of equilibria, depending on initial conditions, that is, for one given $Z_1$, there is one equilibrium:

$$
V^{**} = Z_1 \frac{1}{\alpha^2 \theta + \beta - \lambda i} \\
Y^{**} = Z_1 \frac{1}{\alpha^2 \theta + \beta - \lambda i}
$$

There is a “path dependency”, that is, if a shock occurs during the traverse toward long-term equilibrium, a distinct equilibrium is reached. Overall, the position of the aggregate economy depends on initial conditions and all shocks.

Stability is more easily guaranteed than in the previous model.

The discussion in Section 1 still holds. At issue here is the impact of an increase of the adjustment parameter $\beta$ in the reaction of the government to deficits (a stricter determination to return to a balanced budget). Beginning with a situation in which a deficit exists, the output to which the economy will converge will be lower if $\beta$ is larger. Conversely, beginning with a situation in which a surplus of the budget prevails, the output in the long-term equilibrium will be higher if $\beta$ is larger.

### 2.2 Distinguishing between capitalists and wage-earners

We return here to the model of Section 1, which we modify in a new manner, distinguishing between capitalists and wage-earners.
2.2.1 The overall framework

The wage-earners receive a wage, $W$, and consume $C^W$. The capitalists receive all profits, $\Pi$, and consume $C^K$. Parameter $\omega$ denotes the share of wages, assumed constant. One has: $W = \omega Y$ et $\Pi = Y - W = (1 - \omega)Y$. The revenue of the government is $T = T^W + T^K$ (with the same tax rate for the two categories of households). It finances its deficit, $Def$, by issuing bonds purchased by capitalists and banks. An interest rate, $i$, is paid on these bonds.

The disposable income of wage-earners is:

$$C^W = (1 - \theta)\omega Y$$  (13)

Capitalists behave as households in Section 1, though in their total income, $\Pi$ must be substituted for $Y$. They invest a given fraction, $\lambda$, of their savings in bonds (or, considering stocks, a fraction, $\lambda$, of their wealth is invested in bonds): $B^h = \lambda V$. Their disposable (after-tax) income is:

$$Y^D = (1 - \theta)((1 - \omega)Y + iV_{-1})$$  (14)

Their consumption function is:

$$C^K = \alpha_1 Y^D + \alpha_2 V_{-1}$$  (15)

And their wealth grows with their savings:

$$V = V_{-1} + Y^D - C^K$$  (16)

In a short-term equilibrium, supply has been set to the level of demand:

$$Y = C^W + C^K + G$$  (17)

The five equations 13, 14, 15, 16 and 17 define the model. Its resolution is similar to the one in Section 1.

2.2.2 Short-term equilibrium

In a short-term equilibrium, the stock of wealth, $V_{-1}$, of capitalist is taken as given. We introduce the auxiliary notation $\alpha_{1\omega} = \omega + (1 - \omega)\alpha_1$ (a weighted consumption rate). The short-term equilibrium is the solution of the four equations 13, 14, 15 and 17. One finds:

$$Y^* = \frac{G + (\alpha_2^2 + \lambda \alpha_1 (1 - \theta)V_{-1})}{1 - \alpha_{1\omega}^1 (1 - \theta)}$$

The impact of the share of wages is felt through $\alpha_{1\omega}^1$. If $\omega$ is larger, $\alpha_{1\omega}^1$ is also larger and, therefore, the same is true of $Y^*$. The expected stimulative impact of wages is observed.
2.2.3 The dynamics toward long-term equilibrium

Substituting its short-term equilibrium value \( Y^* \) for \( Y \) in equation 16, the equation accounts for the dynamics toward long-term equilibrium:

\[
V = V_{-1} \left( 1 - \frac{\alpha^2 \theta - \lambda i (1 - \theta)(1 - \alpha^1)(1 - \omega(1 - \theta))}{1 - \alpha^1(1 - \theta)} \right) + G \frac{(1 - \theta)(1 - \alpha^1)(1 - \omega)}{1 - \alpha^1(1 - \theta)} \tag{18}
\]

The long-term equilibrium values of \( V \) and \( Y \) are:

\[
V^{**} = G \frac{\alpha^2 \theta - \lambda i (1 - \theta)(1 - \alpha^1)(1 - \omega(1 - \theta))}{1 - \alpha^1(1 - \theta) - \lambda i(1 - \omega(1 - \theta))}
\]

\[
Y^{**} = \lambda G \frac{\alpha^2 \theta}{1 - \alpha^1(1 - \theta) - \lambda i(1 - \omega(1 - \theta))}
\]

In addition to the properties of the long-term equilibrium in Section 1, the equilibrium \( Y^{**} \) is lower if the wage share is larger. The stimulative effect of an increase of the wage share does not hold in the long run, but the reverse.

3 - Quoting GL

In the three models above, reference has been made to the chapters of GL’s book where such frameworks are presented. In spite of their simple character, the models have been devised to preserve GL’s basic findings. This section returns to GL’s original formulations. We list various categories of quotations from the book concerning: (1) market clearing; (2) endogenous money and finance; (3) Short-term temporary equilibrium and the steady state; (4) the wealth effect and the ensuing paradoxical effects; and (5) the value of the capacity utilization rate in the long run.

3.1 The clearing of markets

In this section, we only consider the commodity market and the “labor market”. (Quotations concerning financial markets and money-credit are presented in section 3.2.)

3.1.2 The commodity market

In this respect, we fully agree with GL:

There are several mechanisms that could lead to such a result [the equality between demands and supplies]:

The first mechanism is mainly associated with mainstream theory, that is, neoclassical theory: variations in prices clear the market. Excess demand leads to higher prices,
which is assumed to reduce excess demand. This mechanism is put into effect within the period, before transactions are made. When transactions occur [...], supply and demand have already been equated through the price clearing mechanism. We believe that such a market clearing mechanism, based on price variations, is only appropriate in the case of financial markets. In the case of goods and services markets, and in the case of the so-called labour market, we believe that the hypothesis of market-clearing equilibrium prices is wholly counterfactual, inappropriate and misleading.

The second mechanism is associated with the so-called rationing theory, also called constrained equilibrium theory. Despite being based on an essentially neo-classical view of markets, this approach eschews market clearing prices, by imposing some rigid prices. It says that whenever supply and demand are different, because of these rigid prices, the adjustment is done on the short side of the market. [...] we shall not pursue this line of thought.

The third mechanism is linked to the existence of inventories. Firms hold a buffer of finished goods, which can be called upon whenever demand exceeds production. Sales are always equal to demand because it is assumed that inventories are always large enough to absorb any discrepancy between production and demand. In this approach it is necessary to track the evolution of inventories from period to period, and to pay meticulous attention to the way in which they are measured, in particular to how they are valued. It has been advocated by authors of various heterodox traditions, in particular Godley and Cripps (1983) and Duménil and Lévy (1993: 95), who call it the “general disequilibrium approach”. This mechanism — which we consider to be the most realistic one — will be described in detail, but only when we deal with private money, for reasons that will become obvious.

Finally, there is a fourth mechanism, the so-called Keynesian, or Kaleckian, quantity adjustment mechanism. This is the mechanism that is being called upon in the present model. With the previous three adjustment mechanisms, production was assumed to be given, set at some constant level at the beginning of the period. In the Keynesian and Kaleckian approach, production is the flexible element of the model. Producers produce exactly what is demanded. In this approach, there are no inventories. [...] Sales are equal to production. The equality between demand and supply, the latter being here defined as production, is achieved by an instantaneous quantity adjustment process, as is always the case in standard Kaleckian and Keynesian models. [...] This mechanism is more likely to be appropriate in a service industry, where the service often is being provided right away, as soon as it is demanded. In the case of manufacturing, where production takes time, such an instantaneous quantity adjustment process is unlikely; the third mechanism, that based on inventory adjustments, is much more realistic.\(^2\)

3.1.2 The labor market

GL actually abstract from the “labor market”, assuming that a reserve army is available:

[...] there is a reserve army of unemployed workers, all eager to work at the going wage, whenever their labour services are being demanded.\(^3\)

In this framework, the growth rate is not determined by the exogenous growth rate of the available labor force. We certainly agree with this analysis.

2. 3.3.2 Mechanisms adjusting supply and demand, p. 63-65.
3. 3.3.2 Mechanisms adjusting supply and demand, p. 63.
3.2 Endogenous money and endogenous finance

“Endogenous” does not refer here to the determination within a model (as opposed to “exogenous”). “Endogenously determined” means that demand determines supply: “supplies of assets passively match demands”.

In GL’s analysis, not only money and credit are endogenously determined. The same is true of all financial assets:

These last two equations are thus saying that the (net) supply of bills and the supply of bonds are provided passively, in response to demand.4

We are proposing something entirely different here. We are saying that banks respond passively to the needs of business for loans (within the limits imposed by creditworthiness, which will not be modelled here however) and to the asset allocation activities of households, as well as providing the means of payment.

[...]
The first three equations (10.62-10.64) in Box 10.10 describe ‘supplies’ of all three kinds of money to households, which are assumed to passively match ‘demands’, which are all determined in the way explained in the household section above. Equations (10.63) and (10.64) say banks passively accept the money that is being deposited with them. With equation (10.62), we assume that the central bank provides all the cash that is demanded by consumers. The central bank never refuses to provide commercial banks with the banknotes that their clients need for transacting.5

The next seven equations of Box 11.10, equations (11.77) to (11.83) are ‘supply equals demand’ conditions, in other words all supplies of assets passively match all demands.6

The treatment of stockshares is distinct:

A change in stock market prices pe is the mechanism that will bring demand into equivalence with supply, and hence in that case, and in that case only, we have a true price-clearing mechanism.7

3.3 Short-term temporary equilibrium, the steady state, and growth

GL use the method of temporary equilibrium. Rapid and slow variables are distinguished. Rapid variables are flows, and slow variables are stocks. An equilibrium (a short-term equilibrium) of rapid variables toward is first determined, assuming the values of slow variables are given. Then, the dynamics of slow variables toward a long-term equilibrium are studied, assuming that the rapid variables have converged toward their short-term equilibrium values. We also use this same method, a quite useful simplification.

In addition to the above notions, GL introduce a particular type of steady states, denoted as ‘stationary states’:

5. Ch. 10 A Model with both Inside and Outside Money, p. 334-335.
7. Section 11.4.3, Portfolio decisions, p. 396-397.
A steady state is a state where the key variables remain in a constant relationship to each other. This must include both flows and stocks, and not flows only as with short-run (temporary) equilibria. When, in addition, the levels of the variables are constant, the steady state is a stationary state. In general, the steady state will be a growing economy, where ratios of variables remain constant. Whether we are in a stationary state or a steady state with growth, we may then speak of the long-run solutions. In the stationary steady state of the model, in which neither stocks nor flows change, government expenditure must be equal to tax receipts, that is, there is neither a government deficit nor a government surplus. 8

GL usually abstract from growth. When growth is considered in Chapter 11, government expenses play the central role as an exogenous variable determining growth:

It is initially assumed these expenditures grow at the rate \( g_g \), a rate that the government can change in a discretionary attempt to raise its share of national expenditures or to raise the growth rate of the economy. 9

### 3.4 The wealth effect and the ensuing paradoxical effects

“Paradoxical” refers here, to the traditional Keynesian doxa concerning the short run.

#### 3.4.1 The wealth effect

In GL models, consumption function always include a variable measuring the “past accumulated wealth” of households (as in equations 3.7, 4.5, 5.6, 7.16, 10.29 and the like):

The consumption decision is made on the basis of a Modigliani-type consumption function, with disposable income or expected disposable income and past accumulated wealth as the main two arguments of the function. 10

In the wealth effect, wealth stimulates the demand of households independently of their income. Wealth may be money or financial assets (for example, bonds issued by the government to finance its deficit).

#### 3.4.2 The interest rate

As shown in the following quotations, the effect of the interest rate on the general level of activity is a straightforward consequence of the wealth effect:

Equations (4.18) and (4.19) have the counterintuitive property that in the full stationary state, the aggregate income flow and the disposable income flow are an increasing function of the interest rate. As higher interest payments on government debt builds up, disposable income rises and so do consumption and national income. As disposable income rises, this induces households to hold ever greater wealth. In addition, with higher interest rates, households are encouraged to hold a larger proportion of their wealth in the form of bills. It follows, in contrast to what most students of principles of economics are taught, that higher interest rates generate more economic activity, not less, unless high interest rates have a detrimental impact on some components of aggregate demand. 11

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8. 3.5 Steady-state solutions, p. 71.
10. Ch. 13, General Conclusion, p. 494.
11. 4.5.1 The puzzling impact of interest rates, p. 114.
This effect is quite general (that is, not specific to one of GL’s models):

Because the multiplicand includes interest payments on the debt, the puzzling positive long-run effect of higher interest rates on national income still arises in more sophisticated models where interest rates do have strong negative short-run effects, as we shall see later in the chapter and in other chapters.¹²

One can return here to the expression of $V^{**}$, the long-term equilibrium value of wealth, in equation 9, in which the wealth is an increasing function of $i$.

### 3.4.3 The paradox of thrift

The refutation of the paradox of thrift is also a consequence of the wealth effect:

Thus the smaller the propensities to consume, the larger the steady-state levels of income and disposable income. In other words, if households are more thrifty — if they decide to save a larger proportion of their income and of their wealth — the steady-state income will be higher.

[...] this puzzling result [...] contradicts the well-known paradox of thrift, that had been advanced by Keynes (1936) and emphasized over the last sixty years or so by Keynesians and post-Keynesians alike. Once again, the reason for which higher thrift leads to a higher stationary level of income is that a larger $\alpha_3$ parameter [the wealth to disposable income ratio] implies that households are aiming at a higher wealth target, for a given income ratio. But a higher wealth target, all else being equal, implies larger interest payments on government debt held by households, and hence, ultimately, higher absolute consumption and income levels once the steady-state has been achieved.¹³

The refutation of the paradox of thrift is less general that the effect of $i$. The title of Section 7.4.2 is: The paradox of thrift recovered. GL explain that the paradox of thrift is recovered in models without government:

The reader may recall that in models devoid of a government sector, Keynes’s paradox of thrift held up: an increase in the propensity to consume led to an increase in national income; by contrast, in models with a government sector, a higher propensity to consume led, in the long run, to reduced national income.¹⁴

### 3.5 The value of the capacity utilization rate in the long run

In GL’s model of Chapter 7 the capacity utilization rate converges toward a normal value in the long run. This is expressed in equation 7.25 and in the commentary of Figure 7.4:

[...] Figure 7.4 illustrates the evolution of the output to capital ratio ($Y/K_{-1}$), which is some proxy of the rate of utilization of capacity [...]}. As can be seen from Figure 7.4, the recession generated by the increase in the propensity to save is accompanied by a drop in the rate of capacity utilization, but as the economy goes towards its new steady state, the output to capital ratio goes back to its desired level, and hence the rate of utilization goes back to its initial level.¹⁵

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¹². 4.6.1 Some puzzling results, p. 116-117.
¹³. 4.6.1 Some puzzling results, p. 117.
¹⁴. Section 11.8.1 An increase in the propensity to consume out of regular income, p. 422.
This outcome is obtained as a result of the definition of an investment function in which enterprises seek a return to a normal capacity utilization rate: \( \gamma(u - \pi) \). (GL use another expression of disequilibrium, as \( K^T - K \), that is, the desired stock of capital, given the value of output, minus the existing stock.) When the above equation for investment is not considered, puzzling results are obtained. Within GL’s model of Chapter 11, there is no reaction to the disequilibrium between \( u \) and \( \pi \), and in the variant 11.16.4, a permanent increase in the growth rate of pure government expenditures, they reach a puzzling result:

\[ \text{[...] the rate of output growth [...] oscillates towards a steady growth rate at about 3.1%, much below the 3.5% growth rate of real pure government expenditures, and this despite the fact that the real rate of capital accumulation does seem to be moving towards the 3.5% figure.}^{16} \]

The conclusion is unescapable:

Since the growth rate of output [...] is lower than the growth rate of capital, this implies that the rate of capacity utilization is gradually falling.\(^{17} \)

4 - First steps toward a comparison

GL’s models are probably the most sophisticated framework within the “post-Keynesian” macro perspective in a broad sense. Both the accountings and the formalisms are rigorously conducted. The discussion should focus on economic mechanisms. We abstract here on issues which are not considered by GL, though important components of our framework, like the role conferred on the instability of short-term equilibrium in the analysis of business-cycle fluctuations.\(^{18} \) We also leave aside points of convergence already noted in the previous section.

Five main aspects must be emphasized:

1. Endogenous or accommodative money. This is certainly the main divergence with GL. In the analysis of the aggregate economy, we favor what we denote as the “credit channel”.

Two distinct approaches are found in the literature:

- Money and finance are determined endogenously, that is, the demand of financing is always satisfied. For example, households can always borrow from banks or the government issues bonds automatically purchased by either households or banks. The meaning of the notion and its role within GL’s framework have been considered in Section 1.3.

- Money and credit are determined exogenously. The suppliers of financing prevail, and the agents seeking financing adapt their behavior to this situation.

In the framework we developed, money and finance are neither endogenous nor exogenous, but “co-determined”. The two sides are considered simultaneously. The control by

\(^{16} \) 11.7.4 A permanent increase in the growth rate of pure government expenditure, p. 412, n.20.

\(^{17} \) 11.7.4 A permanent increase in the growth rate of pure government expenditure, p. 412.

\(^{18} \) G. Duménil, D. Lévy, A Note on Godley-Lavoie Monetary Macroeconomics, PSE, Paris (2012).
central institutions (government and the central bank) is crucial. In the absence of this central control, the “procyclical character” of the demand for financing, at the origin of the “built-in instability” typical of capitalist macroeconomies. Under specific circumstances, as during the present phase of the current crisis, situations of “credit crunch” may prevail, in which monetary policy becomes inefficient. Only fiscal policy may support the aggregate economy.

2. The general level of activity in the long run. This discussion hacks back to the controversy over the value of the capacity utilization rate along a long-term equilibrium.

We have shown in Section 3.5 how GL incidentally obtain such a convergence in the long run, referring to an investment function in which investment responds to the disequilibrium on the capacity utilization rate (\( u \neq \bar{\pi} \)). The difficulty with this approach is that it would be difficult to generalize to the consideration of growth as the problem known as “Harrodian instability” would be met.\(^\text{19}\)

As in the classical-Marxian approach to growth, we conserve the view that, in the long run, the aggregate economy gravitates around a normal use of productive capacities. To us, this gravitation is not only the outcome of behaviors on the part of private agents. In a modern economy with a sophisticated credit and financial system, this property can only be the outcome of the behavior of central authorities (also Keynes’ view). We emphasize the credit channel and the action of central monetary authorities in the conduct of the general level of activity toward appropriate levels. But, in the long run, the transformation of the institutional framework (as in agencies, law, regulation, and the like) that command monetary and credit mechanism is also required.\(^\text{20}\)

Similar types of mechanisms accounting for the effect of the action of central authorities could be introduced within GL’s models. In the framework of the model of Section 1 or similar models, GL could describe a convergence of the general level of activity in the long run toward normal levels by adjusting government expenses or the interest rate.

3. The wealth effect. In our opinion, the empirical importance of the wealth effect is very limited. We agree that, in given and limited circumstances, a wealth effect may play a role, but not the central role conferred on this mechanism by GL.

More research will be needed to be more specific. In the years preceding the current crisis in the United States, the hike in the prices of housing stimulated lendings to households and, finally, both construction and consumption. The wealth effect on stock shares remained, apparently, quite limited.

As contended below, in the analysis of long-term equilibrium, the wealth effect, as within GL’s theoretical framework, has very questionable consequences, both from the Keynesian and the classical-Marxian viewpoints.

4. Interest rates. The paradoxical stimulative effect of interest rates in the long run in GL’s models is a direct consequence of the wealth effect. Contrary to the situation prevailing


\(^{\text{20}}\) Within traditional accumulation frameworks such as those of Smith, Ricardo, and Say, the problem of demand levels is not posed. Profits are accumulated and output grows correspondingly. A form of Say’s law is involved. In Volume I of Capital, the same mechanistic approach to accumulation and growth is used, one aspect of Marx’s method of abstraction. It is only in Volume III that Marx discusses business-cycle fluctuations and topics such as the “capacity utilization rate” are discussed, although the term is obviously not used.
in a short-term equilibrium, the central role is not played by the variation of the flow of interest, but by the wealth effect. The stimulative effect of a higher interest rate is that the deficit of the government is increased. In a long-term equilibrium, this deficit is equal to the wealth of households, and larger deficits increase this wealth.

5. The refutation of the paradox of thrift. It is easy to understand the link between the wealth effect and the stimulative impact of savings on long-term equilibrium. More savings result in more wealth, and more wealth encourage demand in the long run.

One consequence of this mechanisms is that, in a model in which capitalists save more than wage-earners, the rise of wages is detrimental to the aggregate economy. The rate of savings diminishes, less wealth is accumulated, and consumption is diminished.

Some of the findings, such as GL’s treatment of the paradox of thrift, are evocative of a more classical-Marxian perspective in the long run, but the convergence masks fundamental differences in mechanisms, and might be delusive.
Contents

1 - GL’s basic model: Money-credit and government bonds .......................... 1
   1.1 General framework ........................................................................... 1
   1.2 The structure of the model ................................................................. 2
   1.3 The accomodative behavior of banks (or endogenous money) ................. 4
   1.4 Short-term equilibrium ..................................................................... 5
   1.5 The dynamics toward long-term equilibrium ...................................... 5
2 - Two auxiliary models ................................................................. 6
   2.1 Endogenizing government expenses ................................................... 6
   2.2 Distinguishing between capitalists and wage-earners ......................... 7
     2.2.1 The overall framework ................................................................. 8
     2.2.2 Short-term equilibrium ................................................................. 8
     2.2.3 The dynamics toward long-term equilibrium ................................. 9
3 - Quoting GL ...................................................................................... 9
   3.1 The clearing of markets .................................................................... 9
     3.1.2 The commodity market ............................................................... 9
     3.1.2 The labor market .................................................................... 10
   3.2 Endogenous money and endogenous finance .................................... 11
   3.3 Short-term temporary equilibrium, the steady state, and growth .......... 11
   3.4 The wealth effect and the ensuing paradoxical effects ....................... 12
     3.4.1 The wealth effect ................................................................... 12
     3.4.2 The interest rate .................................................................. 12
     3.4.3 The paradox of thrift ............................................................... 13
   3.5 The value of the capacity utilization rate in the long run .................... 13
4 - First steps toward a comparison .................................................. 14