Bridging the gap between Kalecki’s words and the modeling of a monetary macroeconomy

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The focus of this study is the treatment of monetary and credit ("monetary" for short) mechanisms within macro models of business-cycle fluctuations. The analysis is introduced in relation to Michal Kalecki’s work in the broader context of Marxian and Keynesian economics (section 1). Kalecki’s words on investment echo Marx’s approach of accumulation in terms of financing out of previously garnered profits and borrowing. Independently of Keynes, Kalecki developed a framework of analysis hinging around the “principle of effective demand” (in Keynes’s formulation) or, equivalently, a “short-term equilibrium by quantities”, the pillar of Keynesian and postKeynesian (“(post)Keynesian” for short) economics. Kalecki’s methodology is, however, thoroughly distinct from those of Marx and Keynes. In his analysis of the business cycle, Kalecki devoted considerable energy to the investigation of what he, himself, called “economic dynamics” (the mathematical study of “cyclical changes”) to build a theory of business-cycle fluctuations. The study of such economic dynamics requires the definition of a framework in which disequilibrium around short-term equilibrium may prevail. Despite such promising inroads, however, the models presented by Kalecki do not actually lay the foundations of what could be seen as a “common ground” within heterodox economics. The ambition of this study is to bridge this gap.

1 - Kalecki between Marx and Keynes

This preliminary section defines the overall project and introduces the general outline. Three contemporary frameworks specifically relevant to the present investigation are, then, contrasted.

1.1 General outline

Section 2 discusses financing in reference to Kalecki’s statements concerning the financing of investment out of income and borrowing. The analysis is conducted within the postKeynesian framework of transaction-flow matrices extended to the dynamics toward short-term equilibrium. A relationship follows, the straightforward expression of Kalecki’s explicit statements concerning investment, in which
demand is financed out of income and the variation of the net debts of economic agents. Only in a situation of equilibrium the variation of the net debt of households is null.

Section 3 focuses on (in)stability, a central theme in the present study. The stability of short-term equilibrium is always subject to conditions. The section contends that, if abstraction is made of the action of monetary authorities, the behaviors of economic agents are such that short-term equilibrium is unstable, a “built-in instability”. This fundamental property of capitalism makes of the stabilizing action of central institutions a basic requirement. This action is, however, not always successful. Thus, a central aspect of the business cycle is the succession of phases in which the stability of short-term equilibrium is ensured or not.

Section 4 is devoted to the modeling of monetary mechanisms. The principle of “co-determination” is put forward. Not only real and monetary variables (for example, respectively, investment and borrowing) are determined jointly, but both the behaviors of nonfinancial and financial agents are involved. For example, households make projects that only materialize in the negotiation with banks. The action of the central bank is finally crucial. The behaviors of households concerning real and financial variables, and the actions of commercial banks and of the central bank are modeled in a single function, the “co-determined monetary function”. This approach—in our opinion, the cornerstone of monetary macroeconomics—must be substituted for the post-Keynesian perspective of “accommodative” money. In our framework, money is neither endogenous nor exogenous.

A set of possible models of a monetary macroeconomy are introduced in section 5. Alternative stabilizing mechanisms—the control of the level of indebtedness, the control of inflation, the manipulation of interest rates, and fiscal policy—are considered.

Section 6 focuses on the explanatory power of the (in)stability of short-term equilibrium in the analysis of business-cycle fluctuations. A link is, finally, established with Hyman Minsky financial instability framework, in which business-cycle fluctuations are approached in terms of instability and the emphasis is on financial mechanisms.
1.2 Alternative contemporary frameworks

Elaborating on the foundations laid by Marx, Keynes, and Kalecki much work has now been done. The present study refers to three contemporary frameworks:

1. The continuation of the traditional Keynesian viewpoint. A first approach, directly inspired by Keynes’s analysis, is still typical of many Keynesian economists. The focus is on the position of short-term equilibrium, that is, the degree to which productive capacity is used. Reference is made to the uncertainty surrounding expectations in the decision to invest as in Keynes’ original formulations. Did Keynes himself, in the *General Theory*, attempt to interpret the sluggish U.K. macroeconomy of the 1920s or the sudden collapse of output into the Great Depression, which suggests a lost stability? One thing is sure, the theoretical framework built by Keynes focused on the position of short-term equilibrium, not the dynamics toward this equilibrium. Keynes did not contemplate long-term equilibria. The same is true of traditional Keynesian economists.

2. Post-Keynesian economists. The main segment of contemporary Keynesian economists studies short-term equilibria in the traditional Keynesian perspective, but acknowledges that such positions are necessarily “temporary” equilibria. A distinction is made between flows and stocks. Flow variables are studied in the framework of short-term equilibrium, while stock variables are gradually altered along a sequence of short-term equilibria leading to a “Keynesian” long-term steady state with any value of the capacity utilization rate. There is typically little interest in the stability of short-term equilibria.

3. Our viewpoint. The formal framework is the same as in post-Keynesian models, with the consideration of short-term equilibria, and the analysis of the succession of such temporary equilibria converging toward a long-term equilibrium. In such a long-term equilibrium, however, prices have converged toward prices of production (with uniform profit rates) as in Marx’s analysis of competition (and outputs and capital stocks have been adjusted). This is what we denote as “being Keynesian in the short term and classical in the long term”. Another important difference is the attention paid to the stability of short-term equilibrium, in our view, a crucial component in the analysis of business-cycle fluctuations and the main object of the present study.

2 - Financing demand

This section recalls Kalecki’s major statements concerning the financing of investment out of both previously garnered profits and borrowing. The methodology of transaction-flow matrices is used to make explicit the basic macro relationships implicit in such statements. A special emphasis is placed on the application of this accounting framework to the analysis of the dynamics of macro variables out of equilibrium—a truly original approach. The financing framework introduced is more general than the framework considered by Kalecki, in which borrowing are limited to the financing of investment by capitalists. The main result is the formulation of equations that link demands, income flows, and the variations of the net debts of nonfinancial agents, the straightforward expression of Kalecki’s formulations concerning investment.

2.1 Kalecki’s words on the financing of investment

The traditional interpretation concerning investment contrasts a Marxian approach in which investment, denoted as “accumulation”, is financed out of previously garnered profits, and the confrontation between the “marginal efficiency of capital” and the interest rate, as in Keynes’ analysis. Kalecki’s approach to investment is much closer to the Classical-Marxian perspective:

How can capitalists invest more than remains from their current profits after spending part of them for personal consumption? This is made possible by the banking system in various forms of credit inflation.

(“Credit inflation” refers to the expansion of credit or, equivalently, the issuance of money.)

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Not only can savings out of current profits be directly invested in the business [1], but this increase in the firm’s capital will make it possible to contract new loans [2].

The first parts [1] of the two statements echo the perspective of accumulation in the strict sense. Kalecki opens, however, the option that capitalists borrow [2] to finance additional investment. There should be no attempt at theorizing investment and business-cycle fluctuations without this reference to credit (and, obviously, money): “Business fluctuations are strictly connected with credit inflation”.

Such views suggest that real and monetary mechanisms are tightly related and should not be considered autonomously. Note that both Marx and Kalecki associate credit inflation with the rapid expansion of output.

2.2 Accounting relationships

During the recent years, the consideration of monetary and financial variables made important progress within the postKeynesian literature. Real and monetary variables are carefully articulated within tables inspired by national accounting frameworks, denoted as “transaction-flow matrices” as, notably, in Wynne Godley’s and Marc Lavoie’s work. These matrices are used to account for the

6. “Kalecki noted that there is an ‘increased demand for money in circulation [in the upswing of the business cycle] in connection with the rise in production and prices’. (Kalecki, CWI, p. 93).” (M. Sawyer, “Kalecki and Finance”, op. cit. note 2 p. 491).
### Table 1. Equilibrium transaction-flow matrix

<table>
<thead>
<tr>
<th></th>
<th>Wage-earners</th>
<th>Capitalists</th>
<th>Enterprises (current)</th>
<th>Banks</th>
<th>Σ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand and production</td>
<td>-D&lt;sub&gt;W&lt;/sub&gt;</td>
<td>-D&lt;sub&gt;k&lt;/sub&gt;</td>
<td>D</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Income paid out</td>
<td>W</td>
<td>Π</td>
<td>-Y</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Change in loans</td>
<td>ΔL&lt;sub&gt;W&lt;/sub&gt;</td>
<td>ΔL&lt;sub&gt;k&lt;/sub&gt;</td>
<td>0</td>
<td>-ΔL</td>
<td>0</td>
</tr>
<tr>
<td>Change in deposits</td>
<td>-ΔM&lt;sub&gt;W&lt;/sub&gt;</td>
<td>-ΔM&lt;sub&gt;k&lt;/sub&gt;</td>
<td>0</td>
<td>ΔM</td>
<td>0</td>
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<tr>
<td>Σ</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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</tbody>
</table>

### Table 2. Dynamic transaction-flow matrix for period t+1

<table>
<thead>
<tr>
<th></th>
<th>Wage-earners</th>
<th>Capitalists</th>
<th>Enterprises (current)</th>
<th>Banks</th>
<th>Σ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand and production</td>
<td>D&lt;sub&gt;W&lt;/sub&gt;&lt;sub&gt;t+1&lt;/sub&gt;</td>
<td>D&lt;sub&gt;k&lt;/sub&gt;&lt;sub&gt;t+1&lt;/sub&gt;</td>
<td>D&lt;sub&gt;t+1&lt;/sub&gt;</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Income paid out</td>
<td>W&lt;sub&gt;t&lt;/sub&gt;</td>
<td>Π&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-Y&lt;sub&gt;t&lt;/sub&gt;</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Change in loans</td>
<td>ΔL&lt;sub&gt;W&lt;/sub&gt;&lt;sub&gt;t+1&lt;/sub&gt;</td>
<td>ΔL&lt;sub&gt;k&lt;/sub&gt;&lt;sub&gt;t+1&lt;/sub&gt;</td>
<td>0</td>
<td>-ΔL&lt;sub&gt;t+1&lt;/sub&gt;</td>
<td>0</td>
</tr>
<tr>
<td>Change in deposits</td>
<td>-ΔM&lt;sub&gt;W&lt;/sub&gt;&lt;sub&gt;t+1&lt;/sub&gt;</td>
<td>-ΔM&lt;sub&gt;k&lt;/sub&gt;&lt;sub&gt;t+1&lt;/sub&gt;</td>
<td>-ΔM&lt;sub&gt;t+1&lt;/sub&gt;</td>
<td>ΔM&lt;sub&gt;t+1&lt;/sub&gt;</td>
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<tr>
<td>Σ</td>
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macroeconomics of a monetary economy. The objective is to make explicit necessary accounting relationships linking real flow variables (consumption, investment, income) to the variations of stocks (tangible assets, loans, and so on) generated in each period. The link is, thus, established with the matrix in the following period. These dynamics are those of the sequence of temporary equilibria.

The technical aspects of the method depend on the framework of analysis. Various categories of agents can be introduced: households (wage-earners and capitalists), enterprises, banks (commercial and central), and government. The current and capital accounts of enterprises are distinguished. “Current” refers to production, sales, and the distribution of income, and “capital” to the variations of the accounts of the balance sheet of enterprises. A period, typically one year, is considered.

A simple form of such matrices is used in tables 1 and 2. Four agents are considered, capitalists, wage-earners, enterprises, and banks. (In the commentary of the tables, capitalists and wage-earners are jointly denoted as “households”, and households and enterprises, as “nonfinancial agents”.) There is no government. In addition to traditional macro variables—income, consumption, or investment—two categories of financial variables are involved, loans, $L$, and deposits in bank accounts, $M$. Only the variations of these monetary variables, $\Delta L$ and $\Delta M$, are represented in the table jointly with the above macro variables. The analysis of financing here uses the notion of the net debt, $N$, of economic agents, the difference between their loans and deposits, $N = L - M$. The emphasis is on the variation $\Delta N$ of this net debt.

The following additional commentaries can be made:

1. Money is taken in the strict sense of deposits. Thus, there is no distinction between “monetary” and “financial” mechanisms. This framework abstracts from securities, such as bonds and equities, and the payment of interest or dividends. A strict correspondence exists between the two categories of variables as money is issued, $\Delta M$, by new bank loans, $\Delta L$, to wage-earners and capitalists, and destroyed when these loans are paid back (column “Banks”). Thus, $\Delta M = \Delta L$.

Since only households borrow and banks are the unique lenders, the total loans of banks, $L$, are equal to the debts of households: $L^h = L^k + L^w$. Total deposits in the accounts of banks, $M$, are equal to the sum of the deposits of all nonfinancial agents: $M = M^k + M^w + M^e$. 


A difference with Kalecki’s framework is that borrowing is not limited to the financing of investment. The present crisis illustrates the well-known fact that household borrowing is important (in the United States, often larger than borrowing on the part of the nonfinancial business). Thus, it is assumed that households can also borrow for consumption. Such borrowing can be set to zero, and it is easy to return to Kalecki’s framework (as in section 3.1).

2. The column “Capitalists” refers to capitalist households (as consumers) plus the capital account of enterprises where investment is considered. The investment and the consumption of capitalists can be aggregated, $D^k = C^k + I$, as in the line “Demand”. Capitalists receive total profits, $\Pi$, and borrow $\Delta L^k$ to finance part of their demand. Wage-earners receive wages, $W$, consume $D^w = C^w$, and borrow $\Delta L^w$. The variations of the bank accounts of the two categories of households are, respectively, $\Delta M^k$ and $\Delta M^w$.

3. The column “Enterprises” describes the current account of the sector. Enterprises produce and sell what is demanded: $Y = D$, with $D = D^k + D^w$. Thus, it is equivalent to refer to the income created or to sales. Enterprises distribute all income to households as wages and profits (line “Income paid out”). They hold bank accounts, but they do not borrow.

2.3 Assuming short-term equilibrium

Table 1 accounts for basic accounting relationships linking the variables in a short-term equilibrium. The income distributed as wages and profits by enterprises is equal to sales: $Y = W + \Pi$.

(a) Since the total incomes (wages and profits) paid by enterprises to households are equal to their sales, the variation of the deposits of enterprises is null (line “Change in deposits”).

(b) Since $\Delta M^e = 0$, one has: $\Delta M = \Delta M^k + \Delta M^w$.

(c) The variation of the net debt of households is: $\Delta N^h = \Delta L^k + \Delta L^w - (\Delta M^k + \Delta M^w)$. Using the relationships in property (b), this variation can be written: $\Delta N^h = \Delta L - \Delta M$. As stated earlier, in the accounts of banks, $\Delta M = \Delta L$. Thus, the variation of the net debt of households is null, while the net debts of, respectively, capitalists and wage-earners, $\Delta N^k = L^k - M^k$ and $\Delta L^k = L^w - M^w$, may differ from zero, equal with opposite signs, and vary correspondingly. The economic interpretation
is straightforward. For example, if the consumption of wage-earners is inferior to their wages, the prevalence of equilibrium requires that capitalists spend more than profits.

### 2.4 Out of equilibrium

In a dynamic model in which short-term equilibrium does not prevail, the events can also be described within a transaction-flow matrix. If the period in the previous section could be typically defined as a year as within national accounting frameworks, the study of the stability of short-term equilibrium requires the reference to shorter periods, for example a week or a day.

Below we describe the sequence of events between periods $t$ and $t+1$. Table 2 accounts for the flows and the variations of stocks in period $t+1$. As in the previous section, enterprises produce and sell what is demanded during the period (line “Demand and production”):

$$Y_{t+1} = D_{t+1} = D^w_{t+1} + D^k_{t+1}$$  \hspace{1cm} (1)

Conversely, a lag is now introduced between sales and income distribution, as the flows of income paid out to households in period $t+1$ (line “Income paid out”) are those generated by production and sales in period $t$. From the viewpoint of households, this is equivalent to assuming that they receive and use the income generated by their purchases during the previous day, $t$, to finance their new purchases during the following day, $t+1$. Due to the introduction of this lag, the bank account of enterprises varies, and property (a) does not hold. Consequently, some of the relationships involved in properties (b) and (c) are not satisfied.

Thus, important differences with table 1 are observed concerning money and credit. Considering households, the variations of their deposits, on the one hand, and their loans, on the other hand, are no longer equal. From the viewpoint of enterprises, this difference materializes in the variation of their bank account. Out of equilibrium (with $Y_{t+1} \neq Y_t$), one has:

$$\Delta M^h_{t+1} = \Delta L^h_{t+1} + Y_t - Y_{t+1}$$

$$\Delta M^e_{t+1} = Y_{t+1} - Y_t$$
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The variations of the net debts of households and enterprises are now different from zero and equal with opposite signs:

\[
\begin{align*}
\Delta N^h_{t+1} &= \Delta L^h_{t+1} - \Delta M^h_{t+1} = Y_{t+1} - Y_t \\
\Delta N^e_{t+1} &= -\Delta M^e_{t+1} = Y_t - Y_{t+1}
\end{align*}
\] (2)

The following recursion on income can be derived from the first of equation 2:

\[
Y_{t+1} = Y_t + \Delta N^h_{t+1}
\] (3)

Since the aggregate demand emanating from all households is equal to output, \(D^h_{t+1} = Y_{t+1}\), one has:

\[
D^h_{t+1} = Y_t + \Delta N^h_{t+1}
\] (4)

The various components of demand, for each category of agents (given that only capitalists invest), can be expressed in the same manner in reference to the flow of income in the previous period and the variation of the net debt. Concerning wage-earners:

\[
C^w_{t+1} = W_t + \Delta N^w_{t+1}
\] (5)

Concerning capitalists:

\[
D^k_{t+1} = \Pi_t + \Delta N^k_{t+1}
\] (6)

**2.5 Savings**

The relationship to savings can be made explicit. The savings of capitalists, defined as the difference between the income they receive \(\Pi_t\) and their consumption \(C^k_{t+1}\), are:

\[
S^k_t = \Pi_t - C^k_{t+1}
\] (7)

We assume here that capitalists only resort to borrowing for the purpose of investment. Subtracting the consumption of capitalists from both sides of equation 6, one obtains:

\[
I_{t+1} = S^k_t + \Delta N^k_{t+1}
\] (8)

This equation simultaneously accounts for the decision to invest and the financing of this investment. If wage-earners may save or borrow to finance their consumption (positive or negative savings), the equality between the savings and the investment of capitalists is generally not satisfied, even if equilibrium prevails, and \(\Delta N^k_{t+1} \neq 0\). Equation
8 is the direct formal expression of Kalecki’s two statements in section 2.1.

The financing of investment can also be expressed in relation to the total savings of households. Since wage-earners do not invest, the variation of their net debt is equal to their savings, with opposite sign. Consequently, \( S^w_t + \Delta N^w_{t+1} \) is equal to zero. This term can be added to the right-hand side of equation 8:

\[
I_{t+1} = S^h_t + \Delta N^h_{t+1}
\]

with \( S^h_t = S^w_t + S^k_t = Y_t - C^h_t \). (9)

The equality between savings and investment is not always ensured. The situation depends on the prevalence of equilibrium and the category of agents considered. When equilibrium prevails, it is satisfied for all households, with \( \Delta N^h = 0 \) (property (c)), though not for capitalists alone. Out of equilibrium, the equality between total savings and investment for all households does not hold.

Another definition can be given of savings, as the difference between the total output (or income) and the consumption of the goods produced during the same period:

\[
S^{(2)}_t = Y_t - C_t
\]

The difference in the two definitions of savings is the subscript of consumption, either the consumption bought with \( Y_t \), or the consumption produced during the period \( t \). In the definition of equation 10, the equality between savings and investment is an identity, not the mark of equilibrium. It expresses the fact that the fraction of output which is not demanded for consumption is demanded for investment. (9)

### 2.6 Demand, income, and borrowing

Independently of the actions that modify the value of the net debt, the expression of the total demand of households in equation 4 manifests the fact that a given difference between demand and income is always associated with a variation of the same amount of the net debt of households or, equivalently, that households finance their purchases out of their income and net borrowing. The reference

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9. In national accounting frameworks, investment is identically equal to savings, provided that the variation of inventories is included in investment.
to the net debt mirrors the equivalence of four types of monetary actions:

- Depositing on bank accounts (1)
- Using these deposits for demand (2)
- Using new loans (3)
- Paying back loans (4)

Each of these mechanisms affects either the money held at the bank or the gross debt of the agent. The excess of demand on income can be financed out of a previously accumulated stock of money or new loans. Symmetrically, the excess of income on demand can increase the stock of money in banks or be used to pay back loans.

Equation 3 defines a basic recursion, that we consider a key to monetary macroeconomics:

\[
\text{Income in period } t + 1 = \text{Income in period } t + \text{Variation of the net debt of households in period } t + 1
\]

As already stated, when short-term equilibrium prevails (that is, income is constant), the net debt of households is constant.

The overall idea can be formulated in a nutshell. Out of equilibrium, the variation of the net debt of households in one period is, by definition, equal to the difference between two flows: (1) the purchases they make during the period (which increases the net debt), and (2) the income they receive during the same period (which diminishes the net debt). Since enterprises produce what is demanded, the first flow is equal to, \( Y_{t+1} \), the income of the period. Since it is assumed that households receive the income created by production—or, equivalently, sales—during the previous period, the second flow is, \( Y_t \), the income during the previous period. Since these two incomes differ, the variation of the net debt of households is not null and equal to the variation of income as in equation 3. This property must be distinguished from the fact that the overall variation of the net debt of the entire economy is obviously null (as is the variation of the net debt of banks). This divergence echoes the fact that the variation of the net debt of households is equal with opposite signs to the variation of the net debt of enterprises.

Independently of any framework or technical hypothesis, the crucial element here is the sequence purchases—sales and the distribution of the income flow thus realized. If these two events do not coincide in time, the variations of the net debt of households and enterprises are simultaneously created, equal and with opposite signs.
3 - Money, credit, and (in)stability

This section is devoted to the (in)stability of short-term equilibrium. In a dynamic model, stability is typically subject to conditions. Within (post)Keynesian models, the condition for the stability of short-term equilibrium (denoted as “Keynesian stability”), is that the slope of the investment function must be smaller than the slope of the saving function. It is generally assumed that this condition is satisfied.

The first section below expresses such conditions within two simple variants of Kalecki’s models, in which monetary relationships are limited to the borrowing of capitalists to finance investment as in sections 2.1 and 2.5. We contend that, in the absence of the stabilizing action of the central bank, the capitalist macroeconomy would always be unstable, what we denote as “built-in instability”. Consequently, the action of the central bank must be treated as a basic component of macro theory, and not an optional sophistication of mechanisms otherwise defined. This is the object of the second section.

A preliminary statement must be made concerning the decision to produce by enterprises. In a dynamic model built to study the stability of short-term equilibrium, two alternative hypotheses can be made: (1) Enterprises produce exactly what is demanded; or (2) Demand is not yet known when enterprises decide on output, and inventories of unsold goods can exist or rationing prevail. In the present study, we use the first option, in conformity with the vast majority of (post)Keynesian models.

3.1 Built-in instability

Kalecki’s framework is well known. Two agents are considered: (1) wage-earners who have no access to credit and consume exactly what is allowed by their wages; and (2) capitalists who have access to credit and consume a given fraction, $1 - s$, of profits, and may...
borrow to finance investment as in equation 8. Parameter $\omega$ denotes the share of wages in total income. One has:

$$C^w = W = \omega Y$$
$$C^k = (1 - s)I = (1 - s)(1 - \omega)Y$$
$$I = sI + \Delta N$$

When the economy is booming, capitalists tend to push investment to a level higher than what their savings would allow, and the converse is true in a recession. This action is motivated by the objective of adjusting productive capacity to demand, an intuitive behavior supposed to initiate a return to a normal use of capacities. A simple model accounting for this use of borrowing is:

$$\Delta N_{t+1} = \alpha + \beta Y_t \quad \text{with} \quad \alpha < 0 \quad \text{and} \quad \beta > 0$$

Total demand, the sum of the three components, can be written:

$$D = aY + b \quad \text{with} \quad a = 1 - s(1 - \omega) + \beta \quad \text{and} \quad b = \alpha$$

Equilibrium, $Y^*$, is defined by $Y = D$ or $\Delta N = 0$:

$$Y^* = \frac{b}{(1 - a)} = \frac{-\alpha}{\beta}.$$  

Below we consider two dynamical versions of such models:

1. The dynamics of the Kaleckian model with uniformly lagged variables. Assuming that the three components of demand are functions of the value of incomes during the previous period, one has:

$$C^w_{t+1} = W_t$$
$$C^k_{t+1} = (1 - s)I_t$$
$$I_{t+1} = sI_t + \alpha + \beta Y_t$$

Total demand can be written $D_{t+1} = aY_t + b$, with $a$ and $b$ as in equation 12, and the recursion is: $Y_{t+1} = aY_t + b$. Parameter $a$ is larger than 1 for any value of $\beta$ larger than zero. Consequently, equilibrium is always unstable.

This finding is, actually, the formal expression of a straightforward economic mechanism. Loans outstanding expand when the economy is booming and contract in the opposite situation, a procyclical mechanism. (Stability would be ensured if $\beta < 0$, that is, if the new loans moved countercyclically.) A built-in instability follows. In other words, a consequence of the modeling of investment in
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reference to financing is that the propensity of capitalists to borrow
(or pay back their debt) renders equilibrium unstable. Besides the
financing of investment, this built-in instability can be the expression
of any form of credit if such mechanisms are considered.

2. The dynamics of the Kaleckian model without lags on consump-
tion. Within Kalecki’s actual models, a single lag is introduced con-
cerning investment, and this “simple” assumption introduces a degree
of complexity:

\[ C^w_{t+1} = W_{t+1} \]
\[ C^k_{t+1} = (1 - s)I_{t+1} \]
\[ I_{t+1} = sI_t + \alpha + \beta Y_t \]

Total demand can be written:

\[ D_{t+1} = 1 - s(1 - \omega)(Y_{t+1} - Y_t) + \alpha + \beta Y_t \]

Thus, the equation expressing that enterprises produce what is de-
manded \( Y_{t+1} = D_{t+1} \) is an implicit equation in \( Y_{t+1} \). It must be
solved in \( Y_{t+1} \), leading to the new equation:

\[ Y_{t+1} = aY_t + b \text{ with } a = 1 + \frac{\beta}{s(1 - \omega)} \text{ and } b = \frac{\alpha}{s(1 - \omega)} \]

The problem with the framework of equations 14 is that wage-
earners and capitalists must already know the total wages and total
profits of the incoming period when they decide how much to consume
at the beginning of the period. Actually, these incomes will be jointly
determined by the decisions of all agents. For example, total wages
and, consequently, the consumption of wage-earners, will depend on
the demand (consumption and investment) of capitalists. This circu-
lar movement testifies to the fact that consumption behaviors are the
outcomes of problematic implicit shorter term dynamics, even faster
than the dynamics under investigation, and that the convergence of
these shorter term processes is assumed.

With the new definitions of parameters above, the value of the
equilibrium is unchanged and, as in the previous framework, equilib-
rium is always unstable.

3.2 Stability within Kalecki’s models

Although Kalecki explicitly refers to the role of credit in the
financing of investment in addition to savings, the corresponding in-
stability of short-term equilibrium is assumed away in actual models.
In some instances\textsuperscript{11}, Kalecki uses a variant of the accelerator model. In other contexts\textsuperscript{12}, investment beyond savings is linked to a discrepancy between an investment that would have yielded a “normal profit rate”, and the actual investment in the previous period, in a manner ensuring stability:

The considerations concerning the prerequisites for reinvestment of entrepreneurial savings—i.e., whether the investment decisions taken in a given year are to be equal to entrepreneurial savings, exceed them or fall short of them—are closely related to the idea of the “normal rate of profit” $\pi$ on a new investment.\textsuperscript{13}

A last option is the assumption that capitalists only invest a fraction of their savings.\textsuperscript{14} None of these ways out are really convincing.

### 3.3 Stabilizing a monetary economy

The importance of the finding concerning a built-in instability in a monetary macroeconomy must be stressed. This property is, however, subject to the assumption that capitalists autonomously decide on borrowing or, equivalently, that the financial system accommodates their demand. A consequence is that a countercyclical action of central institutions is a requirement. This action must be understood as a “structural” component of capitalism, as soon (and inasmuch) as monetary mechanisms reach an advanced degree of development. This analysis obviously confers a crucial role on the action of central monetary institutions, first of all, the central bank, but also potentially more complex institutions, such as agencies, within a broadly defined regulatory framework. Demand policies by governments are also involved. It is only for simplicity that, with little exception, the remainder of this study refers to the “central bank” and monetary policy.

This statement concerning macrodynamics in capitalism has crucial theoretical implications. The mechanisms implied in the stabilizing role of central monetary authorities are a necessary component


\textsuperscript{13} M. Kalecki, \textit{Theory of Economic Dynamics,} op. cit. note 11, p. 98.

\textsuperscript{14} M. Kalecki, \textit{ibid.,} p. 98.
of the theory of the macroeconomy, not sophistications that can be added or not, once the fundamental framework has been devised.

The consideration of the stabilizing behavior of the central bank does not imply, however, that the stability of short-term equilibrium is permanently ensured. First, considering the financial system globally — commercial banks and the central bank — the outcome is uncertain. The action of the financial system may accompany and stimulate phases of expansion, accommodating or contributing to the built-in instability. Second, stability conditions also depend on the behaviors of nonfinancial agents, and these behaviors are also subject to nonfinancial determinants, notably the profitability of capital and the capacity utilization rate.

Thus, the countercyclical action of the central bank or the government only places limits on the vagaries of the macroeconomy but does not eliminate business-cycle fluctuations. In the absence of such mechanisms, the economy would, however, be fundamentally unstable. The course of output along the phases of the business cycle suggests that this management of the macroeconomy is only partially successful. Stability may be ensured “to some extent” during specific periods and, recurrently, instability prevails during other periods. Overheatings and recessions are always around the corner.

The requirement of a central management of the macroeconomy is a crucial aspect of Keynes’ assessment of capitalism. It is also present in Kalecki’s work, and is an important theme within the post-Keynesian school. One limitation of the Keynesian perspective is, however, that macro policies are considered in reference to the necessity of adjusting the level of equilibrium to appropriate values, not as responding to the requirement of the preservation of stability.

4 - The principle of co-determination

One thing is sure, monetary mechanisms should not be modeled in the traditional framework of the confrontation between given supply and demand curves. Money and credit are not goods or services produced by financial enterprises and demanded by non-financial agents. The section introduces the alternative principle of “co-determination”. Besides the overall idea that real and monetary
variables are simultaneously determined, the notion emphasizes that this determination results from the joint behavior of nonfinancial and financial agents.

The relationship between real and monetary variables, as in the first facet of co-determination above, is already a central aspect of the analysis in the previous sections. Concerning the second facet, familiar processes of interaction are involved. For example, a household willing to buy a house goes to the bank and adjusts its ambitions to its capability to borrow in a reciprocal process of negotiation and assessment of the costs and risks of borrowing and lending.

We call the “co-determined monetary function”, the single functions in which these simultaneous and joint determinations are expressed. For example, the behavior of the banking system is introduced into the equations accounting for the determination of the demand of households. The same is true if the entire macroeconomy is considered.

4.1 Nonfinancial and financial agents

The thesis of a built-in instability in capitalism in section 3.1 clearly sets out the two aspects of monetary mechanisms. Monetary mechanisms allow for the expansion of demand beyond available income when the economy is booming (or the contraction of demand below income when the economy is depressed), and this procyclical (thus, destabilizing) mechanism makes of the stabilizing action of the central bank a basic requirement.

Abstracting from government deficits or surpluses to which section 5.4 is devoted, the dynamics governing the complex issuance/destruction of money, lending/borrowing, and deposits/withdrawals are, actually, the combined outcome of the actions of three categories of agents: (1) households, (2) commercial banks seeking profits, and (3) the central bank in charge of the management of the macroeconomy and the stability of the financial system:

1. Households simultaneously consider their eagerness to buy, their income, the cost of borrowing, and their monetary situation.

2. Commercial banks seek maximum profits, given the assessment of corresponding risks. Depending on the situation of potential borrowers, they may accept or deny loans, and they can impact the amounts. They take into consideration their own situation, including their capability to access available and cheap financing on the part of other
banks and the central bank. Obviously, they must abide by a number of regulations, which differ significantly among countries and periods, constraining their action to distinct degrees.

3. The central bank acts with the triple objective of supporting the action of banks, managing the macroeconomy, and ensuring the stability of the financial system. This means taming or stimulating economic activity, as well as maintaining the stability of the general price level and the levels of indebtedness, with important consequences on the capability of individual agents and commercial banks to borrow. In the accomplishment of these functions, the central bank is surrounded by a number of agencies. Besides interest rates, various ratios (concerning reserves or banks’ equity), and a wealth of regulations perform the task. The frontier between central control and private initiative is susceptible of important variation as manifest in the current crisis.

These three categories of agents constantly interact and negotiate. Monetary mechanisms are determined as the collective and conflicting outcomes of such behaviors and mechanisms.

Concerning the relationship with postKeynesian economists, there is a common agreement concerning the initial statement that, in the modeling of monetary variables, the confrontation between supply and demand functions whose intersection defines an equilibrium price (the interest rate) is inappropriate. But the emphasis within postKeynesian economics is exclusively on the behavior of nonfinancial agents, modeled in demand functions for money and loans. The supply behavior of the banking system is supposed to accommodate this demand (for any value of the interest rate).

4.2 The co-determined monetary function

The joint determination of real and monetary variables refers to a whole set of variables such as purchases, new loans, the amount of debt paid back, and the changes in the bank accounts. One option would be to model separately these various elements. We consider, however, that the demand or variation of the net debt can be synthetically described in single functions for a given agent, a group

15. This criticism also applies to Keynes’ analysis of the determination of interest rates.
of agents, or the entire macroeconomy, depending on the framework under investigation. The consideration of single functions echoes the view that the central bank has a capability to affect the outcome of the complex set of monetary mechanisms impacting the determination of demand.

The synthetic expression of such mechanisms in a single function allows for the construction of macro models that can be treated analytically, as in section 5. In our opinion, such models account for the main properties of a macroeconomy with money.

Equations 4, 5, or 8 are accounting relationships linking the demands and variations of the net debts for, respectively, the entire macroeconomy, wage-earners, and capitalists. They show that, given the income resulting from the sales during the previous period, it is equivalent to determine one of the two variables. We choose to model the variation of the net debts, and denote the corresponding functions as the “co-determined monetary functions”, \( F \):

\[ \Delta N = F \]

To the co-determined monetary functions of each individual or collective agent corresponds a demand function and reciprocally. In the simplest option of a single function for the entire macroeconomy, the model for demand is:

\[ D_{t+1} = Y_t + F_{t+1} \quad (15) \]

An example of such a co-determined monetary function is:

\[ F = \alpha + \beta Y - \gamma N - \delta j \quad (16) \]

Besides the constant \( \alpha \), three linear terms are involved:

1. \( \beta Y \). This first term accounts for the procyclical components of the dynamics of demand and borrowing: (1) the propensity of non-financial agents to borrow; (2) the propensity of commercial banks to accommodate the demands for credit on the part of nonfinancial agents when the economy is booming (or to stimulate such demands as in the mortgage wave in the United States after 2000); (3) the accommodative behavior of the central bank during phases of expansion. There is a symmetrical aspect to each of these components as, during phases of contraction of output, households refrain from borrowing.

To this procyclical component, one must add one or several terms accounting for the limitations placed on borrowing (their stimulation
in symmetrical situations) due to the deviation of a number of variables that might threaten individual or collective interests. Two such terms are considered in equation 16:

2. $-\gamma N$. This term accounts for a first group of countercyclical behaviors: (1) Commercial banks are watchful of the levels of indebtedness, $N$, of their customers; (2) Central banks are also concerned by rising indebtedness, which may jeopardize the stability of the macroeconomy or of the financial system.

3. $-\delta j$. Central banks are wary of inflation rates, $j$, and tend to strengthen monetary policy during phases of inflation. Assuming that overheating is associated with increased inflation rates, and conversely for recessions, this behavior has a countercyclical impact on the macroeconomy.

Various facets of the above reactions lead to the modification of interest rates on the part of the central bank (and commercial banks). An option is, thus, to include the interest rate into the co-determined monetary function. A larger value of the interest rate can be expected to have the following effects: (1) diminished borrowings; (2) early amortization; (3) increased deposits; or (4) diminished withdrawals. In all instances, $F$ is reduced if $i$ is larger.

$$F_{t+1} = \alpha + \beta Y_t - \varphi i_t$$

Then, a reaction function must be introduced modeling the manipulation of interest rate, assuming that $i$ is altered procyclically by the central bank with the objective of stabilizing the macroeconomy.

Obviously, these terms must be understood as simple particular forms of more general mechanisms. The central element here is the combination of pro-$\beta Y$, and countercyclical mechanisms, $-\gamma N$, $-\delta j$, and $-\varphi i$.

5 - Checking built-in instability

This section introduces various models of a monetary macroeconomy based on the principle of co-determination as defined in the previous section. Thus, underlying each of these models is a recursion such as in equation 3:

$$Y_{t+1} = Y_t + F_{t+1}$$
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The general framework is simple. There is no growth, as investment is only a component of demand. No difference is made between wage-earners and capitalists, and demand is considered globally, abstracting from possible specific behaviors relative to consumption and investment. In the model of section 5.4 demand also originates from the government. Thus, it is the only model in which two co-determined monetary functions are introduced instead of one.

Pro- and countercyclical mechanisms are combined. Two first variants are considered depending on the behavior of the banking system: (1) The banking system reacts negatively to the levels of the net debt; (2) The central bank responds to inflation. Two additional models are introduced concerning, respectively, stabilizing policies in which the interest rate is increased when output rises, and fiscal policy responding countercyclically to the levels of output.

Recursions with one or two variables are obtained, and the equilibrium values of the variables can be determined. The stability of equilibrium is ensured in each model under the intuitive condition that the countercyclical mechanisms dominate.

5.1 Controlling indebtedness

Besides a constant, two terms are considered in the macro co-determined monetary function:

$$F_{t+1} = \alpha + \beta Y_t - \gamma N_t$$

A procyclical term, $\beta Y_t$, models the joint behavior of nonfinancial agents and commercial banks. A countercyclical term, $-\gamma N_t$, models the action of the banking system. The consideration of the levels of indebtedness by commercial banks is an aspect of their management of risks. The same is true of the central bank, but the objective is the preservation of the stability of the overall banking system to prevent financial crises.

With $F_{t+1}$ as above, the corresponding recursion with two variables is:

$$Y_{t+1} = Y_t + F_{t+1}$$
$$N_{t+1} = N_t + F_{t+1}$$

This recursion can be broken down into two autonomous components, substituting $Z^1$ and $Z^2$ for $Y$ and $N$, with $Z^1 = Y - N$ and $Z^2 = \ldots$
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\[ \beta Y - \gamma N: \]
\[ Z_{t+1}^1 = Z_t^1 \]
\[ Z_{t+1}^2 = (1 + \beta - \gamma) Z_t^2 + \alpha (\beta - \gamma) \]

The short-term equilibrium is:
\[ Z_{1*}^1 = Z_0^1 \quad \text{and} \quad Z_{2*}^2 = -\alpha \]

Returning to the original variables, \( Y \) and \( N \):
\[ Y^* = \frac{\alpha + \gamma (Y_0 - N_0)}{\gamma - \beta} \quad \text{and} \quad N^* = \frac{\alpha + \beta (Y_0 - N_0)}{\gamma - \beta} \]

These equilibrium values depend on all parameters, \( \alpha, \beta \) and \( \gamma \), and on the initial values, \( Y_0 \) and \( N_0 \), of the two variables.

The stability of the equilibrium in \( Z^2 \) is subject to the condition:
\[ 1 + \beta - \gamma < 1, \quad \text{that is,} \quad \gamma > \beta \]

Parameter \( \gamma \) measures the intensity of the countercyclical component in the action of the banking system, and \( \beta \), the procyclical component. Stability is ensured if the countercyclical component prevails. (The contemporary crisis provides an interesting illustration of the consequences of the excessive relaxation of the countercyclical component.\textsuperscript{17})

5.2 Targeting price stability

This section introduces an alternative model of the macro co-determined monetary function in which countercyclical procedures are fully in the hands of the central bank, while the procyclical term can be imputed to all other agents. The objective of the central bank is price stability. In this framework, it is obviously necessary to account for the dynamics of the determination of prices by enterprises.

The rigidity of prices is a basic assumption in the Keynesian perspective. The adjustment between supply and demand is made by quantities—that is, enterprises set output to the level of demand, with rigid prices—not by prices as in a neoclassical model. We are in full agreement with this viewpoint, but we believe it must be interpreted as an approximation. Instead of “rigid”, prices should be said to be “sticky”, meaning “slowly adjusted”—adjusted much less rapidly than outputs.

\textsuperscript{17} G. Duménil, D. Lévy, The Crisis of Neoliberalism, Harvard: Harvard University Press (2011).
Enterprises mark up on costs, \( p_t = \mu_t w \), where the nominal wage rate, \( w \), is the only cost and is constant. Enterprises slowly adjust the mark-up rate \( \mu_t \). A simple option is to consider that enterprises increase their mark-up rate when output is larger than its target value, \( \bar{Y} \), and conversely if output is lower than this target:

\[
\mu_{t+1} = \mu_t \left( 1 + \varepsilon (Y_t - \bar{Y}) \right)
\]

Thus, the inflation rate is proportional to the deviation of output:

\[
\varepsilon_{t} = \frac{p_{t+1} - p_t}{p_t} = \frac{\mu_{t+1} - \mu_t}{\mu_t} = \varepsilon (Y_t - \bar{Y})
\]

The macro co-determined monetary function combines two components, a procyclical term, \( \beta Y_t \), and a countercyclical term \( -\delta \varepsilon_t \) (and a constant \( \alpha \)):

\[
F_{t+1} = \alpha + \beta Y_t - \delta \varepsilon_t = \alpha + \varepsilon \delta \bar{Y} + (\beta - \varepsilon \delta) Y_t
\]

The recursion, with only one variable, is:

\[
Y_{t+1} = a Y_t + b \quad \text{with} \quad a = 1 + \beta - \varepsilon \delta \quad \text{and} \quad b = \alpha + \varepsilon \delta \bar{Y}
\]

Short-term equilibrium prevails when:

\[
Y^* = \frac{b}{1 - a}, \quad j^* = \varepsilon (Y^* - \bar{Y}), \quad \text{and} \quad F^* = 0
\]

The position of the equilibrium depends on the values of all parameters, but not on the initial values of the variables. The inflation rate is constant but not null, except if \( Y^* = \bar{Y} \).

The condition for stability, \( a < 1 \), is:

\[
\varepsilon \delta > \beta
\]

The first term, \( \varepsilon \delta \), measures the strength of the countercyclical component. It is the product of \( \varepsilon \), the degree of the reaction of enterprises to the disequilibrium concerning the level of production, and \( \delta \), the degree of the reaction of the central bank to inflation. The former is assumed to be weak. Thus, \( \delta \) must be strong enough to ensure that the countercyclical component \( \varepsilon \delta \) dominates over the procyclical component \( \beta \). In this framework, as in the model in the previous section, the central bank has a capability to stabilize the macroeconomy, but this capability is subject to conditions in which the behaviors of nonfinancial and financial agents are jointly involved.
5.3 Manipulating interest rates

The manipulation of the interest rate of the central bank is an important tool in the conduct of monetary policy. The central bank adjusts $i$ depending on various targets such as inflation or indebtedness. The form of the macro co-determined demand function is the one introduced in equation 17. A simple model of the stabilizing action of the central bank is that it increases the interest rate when output rises, and conversely when output diminishes, that is, the interest rate is altered countercyclically. The reaction function is:

$$i_{t+1} = i_t + \nu(Y_{t+1} - Y_t)$$

The recursion is:

$$Y_{t+1} = \alpha + (1 + \beta)Y_t - \varphi i_t$$

$$i_{t+1} = i_t + \nu(Y_{t+1} - Y_t)$$

It can be shown that the equilibrium is stable if the reaction of the central bank, measured by parameter $\nu$, is strong enough. In the absence of the dynamics of the interest rate, the equilibrium would be unstable.

5.4 Fiscal policy

There are two aspects to fiscal policy. It can be the mere effect of the stickiness of expenses compared to the variations of the revenue of the government, or a deliberate action intending to stimulate the macroeconomy.

A difference with the two previous models is that demand emanates from two categories of agents, government and households. Two co-determined monetary functions, $F^G$ and $F^h$, are correspondingly considered. We assume that the sources of government revenue are taxes paid by nonfinancial agents, proportional to aggregate income: $\tau Y$. Government expenses (the purchase of goods and services) move countercyclically: larger than government revenue during recessions ($Y_t < \overline{Y}$), and lower, during periods of high activity ($Y_t > \overline{Y}$). Thus, the government borrows during periods of recession and pays back its debt during periods of high activity. Its net debt varies countercyclically:

$$F^G = -\beta^G(Y_t - \overline{Y})$$
The disposable income of households is \((1 - \tau)Y_t\). Their monetary behavior is procyclical, and their co-determined monetary function is:

\[ F_h = \alpha + \beta Y_t \]

Equilibrium is stable if the countercyclical effect of fiscal policy is strong enough.

### 6 - Business-cycle fluctuations

This section is devoted to the analysis of business-cycle fluctuations. Section 6.1 concludes concerning our own interpretation. Section 6.2 briefly retakes the issue in Kalecki’s work and within the (post)Keynesian perspective. Section 6.3 discusses Minsky’s framework of “financial instability”.

#### 6.1 The (in)stability of short-term equilibrium central stage

The main thesis in the present study is the economic relevance of the (in)stability issue in the analysis of business-cycle fluctuations. Three main aspects must be emphasized:

1. The conditions for the stability of short-term equilibrium may be met or not, and the identification of phases in which stability and instability alternatively prevail is a distinction of crucial importance.
2. The thesis in section 3.1 of a built-in instability in capitalism ascribes this tendency to monetary mechanisms: (1) the effect of a propensity on the part of nonfinancial agents to spend more than is allowed by previously garnered incomes (or symmetrically, to contract their spendings below what income flows would allow, that is, to diminish their net debt); and (2) the tendency of financial institutions to accommodate these demands.
3. This built-in instability renders necessary the stabilizing action of the central bank. Periods of instability manifest the recurrent failures of central institutions to check this built-in instability.

This emphasis on stability conditions opens a new field in which the economic interpretation of these conditions becomes a central
element in the analysis of the business cycle. The ambition of sections 4 and 5 is to provide the foundations of a theory of stability conditions susceptible of empirical application. Parameters such as $\beta$, $\gamma$, or $\delta$, are not simple technical instruments. Their possible variations are subject to economic interpretation. The reference to a “cycle” suggests cyclical patterns of variations of these coefficients, but more “structural” variations can also alter the forms of the business cycle. Various examples could be given of such transformations. The sudden change in the conduct of monetary policy—the 1979 coup\textsuperscript{18}—that marked the entrance into neoliberalism in the United States meant a rise of $\delta$; the transformation of financial mechanisms that led to the subprime crisis can be interpreted as a decline of $\gamma$.

Many basic aspects of the business cycle can be investigated within linear frameworks, as in the present study. But the explanatory power of linear models cannot be extended to the vagaries of the macroeconomy at a significant distance from equilibrium. Once the possible instability of short-term equilibrium is acknowledged, it becomes necessary to consider nonlinear dynamic models.

In the 1980s, in an attempt to account for such dynamics, we built nonlinear dynamic models with a “pitchfork singularity”, in which the (in)stability of short-term equilibrium is central.\textsuperscript{19} These models account for: (1) the gradual drift toward situations in which the short-term equilibrium is unstable; and (2) the sudden fall downward.

The succession of such phases to the point of instability echoes the description of the cycle of industry by Marx:

The path characteristically described by modern industry, which takes the form of a decennial cycle (interrupted by smaller oscillations) of periods of average activity, production at high pressure, crisis, and stagnation [...].\textsuperscript{20}

6.2 Kalecki’s and (post)Keynesian interpretations

As already contended, the focus of traditional Keynesian economics is more on the position of equilibrium than on the fluctuations proper of the general level of activity. The same is true of post-Keynesian frameworks where the investigation is extended to long-term steady states. Although the contrast is sharp between these approaches and ours, it is important to stress that, in our opinion, the emphasis on the (in)stability of short-term equilibrium does not preclude the relevance of the degree to which productive capacities are used. In other works, we considered dynamic frameworks accounting for the shift of the position of equilibrium in the longer run. This is the “post-Keynesian component” of our analysis. Monetary mechanisms are also central stage.

To the contrary, the final objective of Kalecki’s investigation is explicitly the business cycle. The cycle is interpreted as the manifestation of recurrent shocks on a macroeconomy in the vicinity of a stable short-term equilibrium. After a shock, output tends to reconverge toward equilibrium, but a new shock occurs, and so on, creating permanent oscillations. This emphasis on the dynamics of the macroeconomy around short-term equilibrium defines a common point with Kalecki’s approach, although Kalecki does not consider the succession of periods of stability and instability.

The (in)stability issue is not completely absent, however, from the traditional Keynesian perspective. It is (or was) discussed in the framework of “Keynesian stability”, but only the case in which stability is ensured is considered relevant.

Besides Minsky, to which the following section is devoted, Nicholas Kaldor stands out as an exception in this regard. In his paper on the trade cycle, Kaldor contends that, in a vicinity of a normal use of productive capacities, the slope of the investment function is larger than the slope of the saving function or, equivalently, that the slope of the aggregate demand function is larger than 1. Consequently,

22. There is some interest in the instability of long-term equilibrium, denoted as “Harrodian instability” (P. Skott, Growth, Instability and Cycles: Harrodian and Kaleckian Models of Accumulation and Income Distribution, University of Massachusetts, Amherst, Economics Department Working Paper Series (2008)).
the instability of the short-term equilibrium is viewed as a central component of the analysis of the business cycle.24

6.3 Minsky’s financial instability

Because of the importance conferred on instability and the reference to monetary mechanisms, a link can be established between the perspective in the present study and Minsky’s theory of financial instability. The central character of instability is clearly set out by Minsky, and combined with the notion of the succession of phases of stability and instability:

Our current difficulties in economics and the economy stems from our failure to understand and deal with instability.25

The first theorem of the financial instability hypothesis is that the economy has financing regimes under which it is stable, and financing regimes in which it is unstable. [...] over periods of prolonged prosperity, the economy transits from financial relations that make for a stable system to financial relations that make for an unstable system.26

The source of such transitions must be sought in the dynamics of credit mechanisms, financial markets, and financial innovation. The phases of rather balanced growth are explicitly associated with “credit financing”.27 A difference with our approach is that Minsky, besides indebtedness, focuses on the market for financial assets, while, in the present state of our investigation, the emphasis is on the impact on demand of monetary and credit mechanisms.

Minsky acknowledges the effect of the action of the central bank, notably as lender of last resort, although he has serious doubts concerning open-market policies. The attempt by the central bank to restore stability may trigger the fall of the macroeconomy.

The framework of the pitchfork in section 6.1 is directly evocative of Minsky’s instability hypothesis. This is the more Minskian component of our approach. In other works, in which Minsky resorts to dynamic modeling, he manifests a clear consciousness of the necessity of introducing nonlinear behaviors to account for the dynamics in disequilibrium at a distance from an unstable equilibrium.\(^28\) He does not perform the task, however.

References

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