

Keynes on bank credit and labour market from the *Treatise on Money* to the *General Theory*

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1 – Introduction

The idea that the banking system creates money *ex nihilo*, so that “loans make deposits”, can be regarded as a key concept of Keynes’s theory of money and banking, and it is a cornerstone of the contemporary monetary theory of production – hereafter MTP (cf. GRAZIANI 2003)¹. In the *Treatise on Money*, Keynes (1971 [1930]) points out that «it is evident that there is no limit to the amount of bank money which the banks can safely create *provided that they move forward in step*»². Since for the production process to start a previous creation of money by the banking system is needed, it follows that, as well as the movements of the interest rate, one of the most important factors determining output and the level of employment is the bank’s degree of accommodation, i.e. their willingness (and convenience) to fully satisfy firms’ demand for credit. Moreover, insofar as firms use credit to pay wages, banks’ decisions crucially affect output, employment and wages. This idea is clearly present in Keynes’s thought, particularly in the *Treatise on Money*³. The TM has been interpreted as a work moving within the Neoclassical tradition and containing significant differences compared to the *General Theory* (GT), according to what can be called a “discontinuist” reading of Keynes’s thought. In particular, it has been stressed that Keynes’s works before the GT are aligned with the neoclassical-Marshallian tradition; it was only with the GT that Keynes developed his idea of revolutionising economic theory essentially by overturning Say’s law (it was now aggregate demand that determined aggregate supply). Well-known examples of this interpretation are in BLAUG (1968) and PATINKIN (1956, 1987, 1990)⁴. By

¹ A. GRAZIANI, *The monetary theory of production*, Cambridge, Cambridge University Press, 2003.

² J.M. KEYNES, *A treatise on Money*, London, Macmillan, 1971 [1930], p. 23.

³ *Ivi*, p. 244.

⁴ M. BLAUG, *Economic Theory in Retrospect*, London, Heinemann, 1964; D. PATINKIN, *Money, Interest and Prices*, New York, Harper & Row, 1956; D. PATINKIN, *Keynes John Maynard*, London, The New Palgrave, Macmillan, 1987, Vol. 3, pp. 19-41; D. PATINKIN, *On different interpretations of the General Theory*, in «Journal of Monetary Economics», 26, 1990, pp. 205-43.

contrast, other scholars interpret the links between the TM and the GT in a radically different way.

SECCARECCIA (2004)⁵, among others, stresses that: «In carefully examining the two works, one acquires the obvious impression that, with some inevitable modifications, the *General Theory* could be incorporated into the *Treatise*, perhaps, as an additional volume on the workings of a particular phase of the Credit Cycle [...]. In the presentation of the Credit Cycle, the *Treatise* takes us through a logical process covering a complete cycle. Conversely, in the *General Theory*, he limits himself to the notional space τ , representing an interval of logical time within which the level of investment, the capital stock and the state of long-term expectations are all given».

Moving along this line of interpretation, it will be shown that the TM departs from the Neoclassical tradition in at least two basic respects: *i*) Keynes describes the working of a *monetary economy*, where the banking system does not act as a pure intermediary, being in the position to create credit-money without a previous collection of savings, and to fix the *nominal* interest rate⁶; *ii*) in the TM, Keynes emphasises the existence of endogenous mechanisms which generate structural *disequilibrium* involving a dynamic process where vicious circles cannot be stopped except by means of external interventions⁷. These features of the TM are underlined by Keynes himself in the “Preface”⁸: «... I propose a *novel* means of approach to the fundamental problems of *monetary theory*. My object has been to find a method which is useful in describing, not merely the characteristics of static equilibrium, but also those of *disequilibrium*, and to discover the *dynamic laws* governing the passage of a monetary system from one position of equilibrium to another».

The aim of this paper is twofold. First, it aims at providing a critical reconstruction of Keynes’s view on the links between the dynamics of wages and the variation of the interest rate. Second, it aims at analysing the links existing between the interest rate, wages and employment in Keynes’s thought, by means of a simple macroeconomic model, with endogenous money supply. The paper will mainly focus on Keynes’s TM.

⁵ M. SECCARECCIA, *Aspects of a new conceptual integration of Keynes’s Treatise on Money and the General Theory: Logical time units and macroeconomic price formation*, in R. ARENA and N. SALVADORI (eds.), *Money, credit and the role of the State. Essays in honour of Augusto Graziani*, Aldershot, Ashgate, 2004, XVII, p. 302.

⁶ J.M. KEYNES, *A treatise on Money*, London, Macmillan, 1971 [1930], cit., pp.17 ff., also explicitly considers the case where money is used as a «store of value», which is – as we know – a key analytical categories expanded in the GT. He adds (*ivi*, p. 18) that the same phenomenon can refer to «the hoarded ingots and ornaments held as a store of value by the nobles and the people of the country».

⁷ G. FORGES DAVANZATI and R. REALFONZO, *Aggregate demand, social conflict and unemployment. Towards a continuist interpretation of Keynes*, in M. CASERTA and S. FIGUERA (eds.), *Rileggere Keynes*, Milano, Giuffrè, 2008, pp. 41-68 provides a reconstruction of the different interpretations of the TM.

⁸ J.M. KEYNES, *A treatise on Money*, cit., p. xviii, italics added.

The exposition is organized as follows. Section 2 deals with a reconstruction of Keynes's thought on the relation between banking policy and the labour market, focusing on the causes of unemployment. In section 3 a simple macroeconomic model is proposed where the dynamics of the labour market are showed to crucially depend on the dynamics of the credit market. Section 4 concludes.

2 – Keynes on the dynamics of wages, prices and the interest rate

In dealing with the causes of variations of the price level, KEYNES (1971)⁹ distinguishes between «spontaneous changes» and «induced changes». The first case pertains to the increase in money wages, due to the increase in unions' bargaining power, and it is labelled «income inflation». The second case pertains to the increase of profits, which gives rise to «profit inflation»¹⁰.

Keynes mainly focuses on the second case since he assumes that «induced changes are likely to be much more important than spontaneous changes over the short period». Keynes's reasoning is entirely based on a theory of prices based on the “fundamental equation”: the price level of consumption goods is determined by the sum of the average cost of labour (W/e) - i.e. the ratio between money wages and productivity - and the difference between the cost of production of capital goods and savings divided by the total amount of consumption goods - $(I'-S)/R$ ¹¹, i.e.:

$$P = \frac{1}{e}W + \frac{I'-S}{R} \quad [2.1]$$

In what follows, spontaneous and induced changes will be dealt with separately.

a) Spontaneous changes. This is the case where Keynes finds a *direct relation between money wages and interest rates*. His argument runs as follows. If money wages increase, firms react by increasing prices so as to preserve their profits. For firms to pay a higher money wage, the demand for money – on the part of firms – must increase. In the event this is «incompatible with the ideas of the currency authority or with limitations of its powers»¹², the banking system reduces money supply and, as a result, firms react by opposing workers' claims. Accordingly, rises in the money wage prove to be counterproductive for

⁹ *Ivi*, pp. 140 ff.

¹⁰ In particular, profit inflation implies «commodity inflation», i.e. an increase in prices of consumption goods and «capital inflation» which derives from an increase in profits in the capital market (*ivi*, p. 120).

¹¹ *Ivi*, p. 124.

¹² Note that banks' reaction to the increase in prices can also be motivated by the decrease in the real interest rate. In any case, an objective-function of banks must be posed in order to rationalize their decision on the amount of money supply and on the variations of the interest rate.

workers as a whole, because they are opposed by banking policy in the form of credit restriction or higher interest rates (KEYNES, 1971 [1930])¹³. A similar argument is made in the *General Theory* (KEYNES, 1973 [1936])¹⁴. Note that these causal links hold on three conditions. First, it must be assumed that firms are price-makers, and they are in the position to increase prices as a response to money wage increases. Second, Keynes considers only the case where firms react to the increase in money wages by demanding more credit from the banking system, which presupposes that they cannot finance the payment of the money wage bill via internal retentions. Furthermore, wage increases are made possible in a condition of low unemployment, since, for KEYNES (1971), «under the pressure of growing unemployment, the rate of earnings ... will fall»¹⁵.

KEYNES (1971)¹⁶ also considers the case where the price level varies due to the change in “efficiency”. He clearly states that an increase in labour productivity – for a given money wage – determines a reduction of prices, and *vice versa*, and the increase in productivity is assumed to derive from technical progress¹⁷. Third, Keynes’s reference to the «ideas of the currency authority» can be interpreted as a reference to the fact that the Central Bank is solely interested in preserving price stability. As a matter of fact, most of the arguments presented in the TM are devoted to finding the conditions that allow price stability. In order to analyse the dynamics of income distribution within Keynes’s theoretical framework, this is a crucial point, insofar as it is the Central Bank’s target level of inflation which significantly affects the level of employment. If the Central Bank increases its ‘tolerated’ (or target) inflation rate, an increase in the money wage is not counterproductive for workers, since it does not react to the price rise by increasing the interest rate, thus generating a stable dynamics of investments, employment and real wages.

As PROAÑO et al. (2011)¹⁸ stress, in the TM, economic growth can be wage-driven only when the banking system behaves in an accommodating way. This is in line with Keynes’s view of the role of economic policy, as stated in the TM, when he stresses that its main objective should be “the avoidance of waste” and “considerations of social justice”. More in detail, KEYNES (1971)¹⁹

¹³ *Ivi*, pp. 150 ff. As regards these questions, Post-Keynesian scholars emphasise that banks’ decisions are affected by fundamental uncertainty, so that – in economies populated by heterogeneous firms – banks tend to finance big firms, insofar as they consider them less likely to go bankrupt (cf. P. Rasmkogler, *Uncertainty, market power and credit rationing*, Vienna University of Economics and Business Administration, w.p.n.105, 2007. Note that, following this approach, what matters is the size of firms, not – as in Keynes – the level (and the dynamics) of wages.

¹⁴ J.M. KEYNES, *The General Theory of Employment, Interest, and Money*, London, Macmillan, 1973 [1936], pp. 263 ff.

¹⁵ J.M. KEYNES, *A treatise on Money*, cit., p. 185.

¹⁶ *Ivi*, pp. 149 ff.

¹⁷ *Ivi*, p. 51.

¹⁸ C.R. PROAÑO, P. FLASCHEL, H-M. KROLZIG and M.B. DIALLO, *Monetary policy and macroeconomic stability under alternative demand regime*, in «Cambridge Journal of Economics», 35, 3, 2011, pp. 569-585.

¹⁹ J.M. KEYNES, *A Treatise on Money*, cit., p. 152.

maintains that: «in a progressive society where efficiency is increasing it may be better to stabilize purchasing power, but in a declining society where efficiency is declining, to stabilize labour power».

b) *Induced changes*. A rise in profits generates a rise in prices and, for the purpose of maintaining price stability, a consequent increase in the interest rate on the part of the Central Bank. This means that – for a given unitary money wage – *a decline of real wages is associated with an increase in the interest rate*. While an increase in money wages is imputed by Keynes to the increase in union bargaining power²⁰, in the TM Keynes is unclear as to the causes which can determine profits inflation. On this issue, the following remark is worth noting. Keynes maintains that producer's sovereignty is a typical feature of a capitalist economy: «the entrepreneurs have been deciding quite independently in what proportions they shall produce the two categories of output [consumption goods or investment goods]».

He adds that the decisions on savings do not necessarily meet the decisions on investing: «the division of output between investment and goods for consumption is not necessarily the same as the division of income between savings and expenditure of consumption»²¹. Moreover, the decisions to invest do not reflect a purely rational behaviour, insofar as «the behaviour of entrepreneurs at any given moment is based on a mixture of experience and anticipation»²². Since, in view of this “fundamental equation”, the price level of consumption goods depends on the difference between investments and savings (assuming money wages and labour efficiency as given), it follows that inflationary pressures derive from firms' decision to produce more investment goods than consumption goods. This is a case where inflation derives from firms' choices, quite independently of the wage dynamics.

As regards the employment dynamics, Keynes emphasises the existence of the following main vicious circles.

A) Keynes argues that aggregate profits increase as capitalists' consumption increases: «If entrepreneurs choose to spend a portion of their profits on consumption (and there is, of course, nothing to prevent them from doing this), the effect is to *increase* the profit on the sale of liquid consumption goods by an amount exactly equal to the amount of profits which have been thus expended»²³. Accordingly, an increase in capitalist consumption increases profits, thus generating an increase in prices (and a decline of real wages) and an increase in the interest rate. This gives rise to a vicious circle where an initial reduction of real wages produces a further reduction of real wages. This happens because, if capitalists expand their investments over the amount of available savings, prices increase and this pushes the Central Bank to raise the interest rate. The

²⁰ Or because of «the mere human inclination to think in terms of money and to feel an increase of money earnings as a betterment» (*ivi*, p. 152).

²¹ *Ivi*, p. 123.

²² *Ivi*, p. 144.

²³ *Ivi*, p. 125.

increase in the interest rate reduces investments, thus producing a decline of labour demand and, as a result, a decline of money wages. Even if the increase in the interest rate stops the inflationary pressure, real wages result lower than their initial level due to the decrease of money wages. This mechanism can be amplified due to the existence of pessimistic expectations: «the behaviour of entrepreneurs at any given moment is based on a mixture of experience and anticipation ... When for any reason an entrepreneur feels discouraged about the prospects ... he can reduce his output or he can reduce his costs by lowering his offers to the factors of production »²⁴.

B) According to Keynes, a further (and important) effect of interest rate variation should be considered. As we know, the TM is based on the distinction between «financial» and «industrial circulation»²⁵ where «*finance* [includes] the business of holding and exchanging titles of wealth ... including stock exchange and money market transactions» and «speculation», while industrial circulation involves all the activities directly aimed at producing goods and services.

Keynes points out that *i*) financial turnover varies independently from industrial turnover²⁶ *ii*) «the level of value of existing securities [is] determined by *opinion*»²⁷. Although Keynes does not expand the argument, one can argue that – in contexts where credit restriction is in operation, or (actual or expected) interest rates are high – entrepreneurs may find it profitable to allocate their resources in financial circulation, as a result producing a decline of the production of investment goods and a decline of employment and wages. The state of expectations – which rest on non purely rational considerations (given the impossibility of “accurate forecasting”) - plays a pivotal role in these dynamics. KEYNES (1971)²⁸ clarifies that «the behaviour of entrepreneurs at any given moment is a mixture of experience and anticipation». Pessimistic expectations (i.e. when «for any reason, an entrepreneur feels discouraged about the prospect») can be at the basis of low wages, insofar as the entrepreneur «can reduce his output or he can reduce his costs by lowering his offers to the factors of production». On the macroeconomic plane, this involves a decline of profits for firms as a whole, «except insofar as they have the indirect effect of reducing savings or of allowing (or causing) the banking system to relax the terms of credit». Note also that, to Keynes, profits inflation can also derive from a highly accommodating behaviour on the part of the banking system, where such behaviour occurs when the interest rate is not fixed so as to equalize investments and savings. Therefore²⁹: «If the terms of credit are easier than this equilibrium level, prices will rise, profits will be made, wealth will increase faster than savings as the result of the incomes of the public being worth less – the difference being

²⁴ *Ivi*, p. 144.

²⁵ *Ivi*, pp. 217 ff.

²⁶ *Ivi*, p. 223.

²⁷ *Ivi*, p. 230, italics added.

²⁸ *Ivi*, p. 144.

²⁹ *Ivi*, p. 165.

transferred into the pockets of entrepreneurs in the shape of the ownership of increased capital».

On the assumption that money wages are rigid, this sequence generates a condition where *a decrease of the interest rate reduces real wages*. KEYNES (1971) argues that a highly accommodating behaviour on the part of banks does not affect all firms in the same degree, in view of the different weight of the interest rate as a cost of production in different industries «... the effect of easier credit on the costs of production should be, not to stimulate production all round, but to cause a changeover from certain forms of production to other forms; namely, from those for which interest is a relatively unimportant cost to those for which is a relatively important cost»³⁰.

It is worth noting that, by contrast to the standard Neoclassical view of his time, KEYNES (1971, italics added) maintains that, *as a general case*, the credit market is not a competitive market, and that, as a norm, «the banking system works wholly by modifying its terms of lending and not by varying its attitude towards individual borrowers or by any form of *rationing loans*»³¹.

C) A different vicious circle occurs in the case of increased savings. This is explicitly addressed by Keynes when dealing with the «banana plantations» example and, even more clearly, in his well-known examples of the «widow's cruse» and «Danaid jar»³². In dealing with these cases, Keynes finds a *direct relation between savings and unemployment*. This occurs because an increase of savings reduces prices and profits and «will cause entrepreneurs to seek to protect themselves by throwing their employees out of work or reducing their wages». This, in turn, produces a further reduction of consumption, losses and bankruptcies and increasing unemployment³³. Keynes argues that an increase in savings can derive when capitalists react to the reduction of their profits by increasing their savings. It follows that: «profits, as a source of capital increment for the entrepreneurs, are a widow's cruse which remains undepleted however much of them may be devoted to riotous living. When, on the other hand, entrepreneurs are making losses, and seek to recoup these losses by curtailing their normal expenditure on consumption, i.e. by saving more, the cruse becomes a Danaid jar which can never be filled up; for the effect of this reduced expenditure is to inflict on the producers of consumption goods a loss of equal amount. Thus the diminution of their wealth, as a class, is as great, in spite of their savings, as it was before»³⁴.

This argument rests on the following restrictive assumptions.

a. Keynes maintains that the increase in the interest rate, in the event of inflationary pressures, allows the equality between investments and savings, with

³⁰ *Ivi*, p. 189.

³¹ In dealing with this issue, Keynes specifies that he refers to «Great Britain at least» (*ivi*, p. 190).

³² *Ivi*, pp. 158 ff. and pp. 125 ff.

³³ It is interesting to observe that – in contrast to the *General Theory* – in the TM unemployment derives from a lack of investments (and, thus, of aggregate demand) which generates recessionary outcomes not because of the variation of output, but because of the variation of prices.

³⁴ *Ivi*, p. 125.

profits equal to zero and monetary equilibrium. Since, in the TM, Keynes does not provide a theory of the firm and of market structures, one can reach the conclusion that *even if $I=S$ is a condition for price stability, $\pi=0$ does not necessarily correspond to target or normal profits, or, in other words, it cannot necessarily be conceived as an equilibrium condition for firms.*

b. The Keynesian idea that capitalists' savings serve for the purpose of preserving profits in the event of losses applies to an economic system populated by small firms, where the entrepreneur is the owner of the firm³⁵.

c. Keynes does not explain why capitalists should reduce their consumption. In the reconstruction below, it will be argued that – as a general case – capitalists increase their savings (thus reducing their consumption) in order to reimburse their debt to the banks.

In next section a simple macroeconomic model will be provided in order to 'rationalize' Keynes's arguments on the links existing between the interest rate, capitalists' expenditure and the functioning of the labour market. In line with the "continuist" interpretation adopted here, it will be shown that – in the logic of the TM – public expenditure plays a major role in determining the path of employment.

3 – Banking policy, capitalists' expenditures and unemployment: a theoretical model

This section aims at providing a simple macroeconomic model where – on the basis of Keynes's theoretical framework as expounded in his TM – the relation between interest rate, capitalists' expenditure, employment and wages is explored. This exercise is justified on the ground that Keynes's arguments put forward in the TM are often unclear, both because some assumptions are not made explicitly and because the theses proposed are not always consistent. A "rational reconstruction" operation can be useful to clarify Keynes's basic ideas and, at the same time, to make them more familiar to contemporary economists. Moreover, this exercise also serves to provide a "generalization" of Keynes's view, which can be useful in understanding some contemporary macroeconomic dynamics. The focus will be on the dynamics of employment and wages.

In so doing, the following assumptions are put forward:

i) A single consumption good is produced, and it is acquired by both workers and capitalists;

ii) Workers' propensity to consume equals one. It is also assumed that, at the beginning of the production process, capitalists own a disposable income deriving from the net profits (see below) made in the previous production process.

³⁵ The use of the term "losses" is ambiguous in the TM. On the realistic plane, Keynes's reference to negative net profits for all firms deriving from an increase of the interest rate appears questionable. It seems more realistic to assume that an increase of the interest rate generates a *decline* of profits, in a condition where net profit still remains positive.

Capitalists can use this stock of wealth either to consume or save, and, as regards savings, it can be used to finance investments or to pay off their debt to the banks. This occurs in every production period;

iii) It is assumed that firms finance their investments both by means of their internal funds and of bank finance³⁶. Firms' indebtedness is assumed to depend on the expected rate of profits. The level of employment is determined by the level of investments, while the monetary wage rises as the level of employment increases. Workers' bargaining power is endogenous, depending on firms' profit. Public expenditure has a positive effect on firms' aggregate money profits (cf. PARGUEZ, 2007; FORGES DAVANZATI, PACELLA and REALFONZO, 2009)³⁷.

iv) Capitalists as a whole decide how much to save and consume. It is assumed that, at the beginning of the production process, a given stock of consumption goods and capital goods exist, and that firms operate with a Leontief technology.

The symbols used are listed below.

π^* are aggregate gross profits

π_n are aggregate net profits

Ck is capitalists' consumption

Sk is capitalists' savings

γ_1 is the share of profits used by capitalists to pay firms' debt

γ_2 is the share of profits spent in the capital goods market

w is the unitary money wage

N is the level of employment

Ns is labour supply

i is the interest rate

F is the total finance supplied to firms in order to pay workers (which is equal to the wage bill, wN) and in order to buy capital goods (F_c)

r^e is the expected rate of profits

λ is a technical coefficient

w_o is a minimum level of wage

β^o is a coefficient which expresses workers' bargaining power

I are investments

K is the stock of capital

I_A are the investments financed by internal funds

³⁶ For the sake of simplicity, we will only consider the case where firms' expectations are always fulfilled. It should be observed that, in the TM, Keynes does not definitely settle whether the economic system is formed by two sectors (capital goods and consumption goods) or whether firms as a whole act as a consolidated macro-agent. The latter interpretation is supported, among others, by GRAZIANI (2003), and it is conceived as a link between the TM and the MTP. It is based on the "producer's sovereignty" argument, so that firms produce investment goods to use them, not to sell them to other firms.

³⁷ A. PARGUEZ, *The monetary theory of unemployment and inflation or why there cannot be a trade-off between employment and inflation*, Paper presented at the Third International Post-Keynesian Conference, Dijon, November, 2007; G. FORGES DAVANZATI, A. PACELLA and R. REALFONZO, *Fiscal policy in the monetary theory of production: An alternative to the "new consensus" approach*, in «Journal of Post Keynesian Economics», 31, 4, 2009, pp. 605-621.

G is public expenditure
 t is time.

In a condition of monetary equilibrium, aggregate gross money profits are:

$$\pi_t^* = C_{k,t} + I_{A,t} + G_t + w_t N_t - w_t N_t - i_t F_t \quad [3.1]$$

Equation [3.1] establishes that current aggregate gross money profits depend positively on capitalists' expenditure (consumption plus investments) and on public expenditure, while they depend negatively on the interest rate that firms have to reimburse to banks. On the macroeconomic plane, the money wage bill is, at the same time, a source of revenue for firms and a cost of production in monetary terms. In view of assumption ii), equation [3.1] holds on the condition that capitalists are able to pay interest via their accumulated savings, i.e. $S_{k,t} = i_t F_t$. By using their savings in order to pay interest, net profits will be equal to:

$$\pi_{n,t} = C_{k,t} + I_{A,t} + G_t \quad [3.1']$$

Equation [3.1'] establishes that net profits are positively affected by capitalists' expenditure and by public expenditure. Given the net profit, capitalists will devote part of it to their savings in the ensuing production process, as well as to the subsequent expenditure (consumption and investment). In particular, given equation [3.1], capitalists' savings will be equal to:

$$S_{k,t+1} = \gamma_{1,t} \pi_{n,t} \quad [3.2]$$

at the same time investments will be:

$$I_{t+1} = I_{A,t+1} + F_{I,t+1} \left(\underset{+}{r_{t+1}^e} \right) = \gamma_{2,t} \pi_{n,t} + F_{I,t+1} \left(\underset{+}{r_{t+1}^e} \right) \quad [3.3]$$

the residual part of profits will be spent by capitalists in the commodity market as follows:

$$C_{k,t+1} = \pi_{n,t} - S_{k,t+1} - I_{A,t+1} = (1 - \gamma_{1,t} - \gamma_{2,t}) \pi_{n,t} \quad [3.4]$$

In dynamic terms, writing equation [3.1] afresh by introducing consumption [3.4] and investments [3.3] one obtains:

$$\pi_{t+1}^* = \pi_{n,t} - S_{k,t+1} + F_{I,t+1} - i_t F_{t+1} + G_{t+1} \quad [3.5]$$

Firms' indebtedness is now given by $F_{I,t+1} + i_t F_{t+1}$. If capitalists are able to pay their debt by using new savings, the net profit will be equal to:

$$\pi_{n,t+1} = \pi_{n,t} + G_{t+1} \quad [3.6]$$

Equation [3.6] establishes that:

$$\Delta\pi_n = G \quad [3.7]$$

Assume now that public expenditure falls. This generates two effects, which manifest in the ensuing production process. First, in view of equation [3.1], it means a decline of net profits, because of *i*) the direct effect of G on π , *ii*) the reduction of capitalists' consumption and, for a given financing, of investments. Second, it increases the interest rate. This occurs because – given capitalists' expectations – in order to finance their planned investments they have to increase their demand for credit³⁸. This, in turn, reinforces banks' bargaining power, allowing banks to increase the interest rate³⁹. Note that this is likely to occur independently of the behaviour of the Central Bank, since the Central Bank in fact does not fully control the interest rates of commercial banks⁴⁰. In view of assumption *ii*), higher interest rates pushes capitalists to devote an increasing share of their savings to the payment of debt⁴¹, with negative effects on subsequent capitalists' expenditures. It is worth noting that the rise of savings – on the part of capitalists - does not depend on the greater advantageousness of storing liquidity but on their need to store it in response to the higher financial costs. In view of equation [1.1], this involves a drop of aggregate profits⁴².

³⁸ The fact that firms get into debt when interest rates are high is justified on two grounds: *i*) their expectations on future profits are optimistic and/or *ii*) they expect further increases in the interest rate.

³⁹ Note that this effect (the decrease of public expenditure generating an increase in the interest rate) contrasts the standard "crowding out" effect as derived from the IS-LM model. This depends on the fact that, in the Keynesian theoretical model, public expenditure is complementary to capitalists' expenditure. Note also that the movements of the interest rate – according to KEYNES (1971, cit., pp. 335 ff.) – can depend on the lack of co-operation in the management of monetary policy on the international scale. He emphasises that, particularly in the case of fixed rates of exchange, «No national central bank which is a member of an international system, not even the Federal Reserve System of the United States, can expect to preserve the stability of its price level, if it is acting in isolation and is not assisted by a corresponding action on the part of the other central banks».

⁴⁰ Following Keynes, the decline of profits, involving a reduction of prices, should push the Central Bank to *reduce* the interest rate, in order to allow equality between investments and savings. In the logic of this model, this can happen in the ensuing production period, when the Central Bank has verified the reduction of investments. Moreover, as Keynes himself recognizes, the view that the Central Bank can fully control inflationary pressure – by controlling the dynamics of investments and savings - should be seen as a purely *theoretical* view. In actual fact, this does not happen because: *i*) investments are affected by uncertainty, so a necessary link is not in operation between the decline of the interest rate and the increase of investments; *ii*) commercial banks can set the interest rate independently of the base rate fixed by the Central Bank. This latter point is clearly stated by Keynes when he points out that, "at least in Great Britain", the credit market does not work according to the rules governing the functioning of competitive markets, and that credit rationing can be seen as a normal condition (see also KEYNES, 1971, cit., chapter 37).

⁴¹ For the sake of simplicity, it is assumed here that capitalists repay their debt to banks at the same time as when they get into debt.

⁴² The Keynesian «Dainad jar» is conceived here as a *special case* occurring when the interest bill is higher than capitalists' savings, generating negative net profits.

Note that equation [3.1] settles that investments depend negatively on the interest rate and depend positively on public expenditure. The first effect rests on the argument that the increase in the interest rate increases capitalists' savings devoted to reimbursement of debt to the banks, which, in every production period, involves a reduction of internal funds devoted to financing investments and consumption. In other words, as the interest rate increases, aggregate net profit decreases, as does capitalists' expenditure. The second effect derives from assumption *iii*): an increase in public expenditure increases profits and, given capitalists' propensity to save, leads to an increase in investments. Moreover, for the argument above, the reduction of public expenditure generates an increase in the interest rate, which affects profits and investments negatively. In view of equation [3.1] and assumption *iii*), the decline of investments has a negative effect on firms' aggregate profits and the decline of profits has a negative effect on investments⁴³.

On the basis of equation [3.3], the amount of capital goods that firms acquire is: $K=\phi(I)$. Given the assumption of a Leontief technology, the level of employment is:

$$N_{t+1} = \frac{K[\phi(I)]}{\lambda} \quad [3.8]$$

In view of assumption *iii*), the wage equation is:

$$w_{t+1} = w_0 + \frac{\beta \left(\pi_{n,t} \right) N_{t+1}}{Ns} \quad [3.9].$$

Equation [3.9] establishes that for any given level of employment, the higher workers' bargaining power, the higher the unitary money wage. Since workers' bargaining power depends on firms' profits, the conclusion is that – in line with Keynes – the lower the profits, the lower the wages. This conclusion holds on condition that when profits are high, firms *can* sustain wage claims, and that, on the other hand, when profits are low wage claims are low as a result of unions' aim of obtaining wage rises under the constraint of not determining the bankruptcy of the firm.

By substituting [3.3] into [3.5], one obtains:

$$N = \frac{K[\phi(\gamma_2 \pi_n + F(r^e))]}{\lambda} \quad [3.10]$$

Equation [3.10] establishes that the level of employment is higher:

- i*) the lower the value of λ (i.e. the more labour-intensive investments are);
- ii*) the higher the public expenditure and the lower the interest rates. High public expenditure implies high profits and, for a given capitalist propensity to

invest, high investments. Moreover, in view of the argument above, high public expenditure – by increasing net profits and hence the possibility of self-financing investments – is associated with a low demand for bank credit and a low interest rate.

By substituting [3.10] into [3.9], one obtains:

$$w_{t+1} = w_o + \beta(\pi_{n,t}) \frac{K[\phi(\gamma_2 \pi_n + F(r^e))]}{\lambda N_s} \quad [3.11]$$

Equation [3.11] establishes that for any given level of employment, the higher workers' bargaining power, the higher the unitary money wage. Since workers' bargaining power depends on firms' profits, the conclusion is that – in line with Keynes – the lower the profits, the lower the wages. This conclusion holds on the condition that when profits are high, firms *can* sustain wage claims, and that, on the other hand, when profits are low wages claims are low as a result of unions' aim of obtaining wage rises under the constraint of not determining the bankruptcy of the firm.

As regards the dynamics of real wages, it can be seen that two contrasting effects are involved. On the one hand, the increase in savings reduces prices, as established by Keynes's fundamental equation. On the other hand, the reduction of employment generates a reduction of aggregate supply and, hence, an increase in prices⁴⁴. The combination of these effects lends ambiguity to the dynamics of wages in real terms, which ultimately depends on the magnitude of savings reduction and on the magnitude of employment reduction. Moreover, the reduction of prices can be a short-run outcome, while the reduction of output requires time and occurs in a long-run perspective⁴⁵.

The recessionary phase, deriving from the increase in capitalists' indebtedness towards banks, can be stopped only by means of external intervention, namely by means of expansionary fiscal policy. KEYNES (1971)⁴⁶ points out that, in cases of «severe unemployment», «the Government must itself promote a

⁴³ Note also that the decline of profits amplifies the negative dynamics of investments, insofar as – in the future production processes – capitalists will have less internal funds.

⁴⁴ J.M. KEYNES, *Treatise on Money*, cit., pp. 177 ff., followed the so-called “Gibson Paradox”, that states that there is a close statistical correlation between interest and prices. In view of the contemporary developments of the price theory in the Post Keynesian theoretical framework, it can be seen that the interest rate enters the price equation because it is a cost for firms. The rationale for this argument lies in the idea that the interest rate is a “tax on profits”, so that – for a given market structure, unitary wage and productivity – if it increases, the profit rate must fall. This effect applies particularly when investments are insensitive to changes in interest rates, so that – being exogenously determined by entrepreneurs' “animal spirits” – monetary policy affects the price level not through variation of the aggregate demand, but via firms' pricing. A similar view is shared, among others, by P. DOCKERTY, *Money and employment*, Cheltenham, Elgar, 2005.

⁴⁵ We thank Giorgio Colacchio for raising this point.

⁴⁶ J.M. KEYNES, *Treatise on Money*, cit., p. 337, italics added.

programme of domestic investments». Moreover: «the desired result [i.e. the reduction of unemployment] can only be obtained through some method by which, in effect, the Government subsidises approved types of domestic investment or itself directs domestic schemes of capital development»⁴⁷.

The following remarks are also worth noting.

a. A composition failure occurs in this case. In fact, while the increase in savings on the part of the individual capitalist does not affect his net profits, for capitalists as a whole this involves a reduction of profits, via the decline of their expenditure.

b. Keynes refers to a value of the money wage ensuring price stability and the constancy of the interest rate and, more generally, he reaches the conclusion that *the dynamics of money and real wages is ultimately governed by the Central Bank* and that, as a result, the dynamics of money and real wages rest on a *political decision*⁴⁸: «... if – which is usually assumed by monetary reformers – we have at least a *partial* control of the currency system but not of the earning system ... we have some power of deciding what the equilibrium price level and rate of earnings is to be».

He adds that – in the event the Central Bank is solely interested in controlling inflationary pressures – this can produce a condition where *monetary equilibrium is associated with “chronic unemployment”*⁴⁹. Although Keynes is unclear on this point, he seems to suggest that this case derives from the following sequences: high interest rates are associated with low profits and low investments, so that the price level is low and the unemployment rate is high⁵⁰: «If prices are low because entrepreneurs are accepting losses and not because costs of production have been reduced, a continuance of them can only result in a progressive increase of unemployment; and if the pressure on the supply of money has only been relaxed by the expedient of reducing output and employment, then monetary equilibrium will continue to require the prolongation of chronic unemployment. Thus it is only when what I have called the consummation of the process have been achieved, namely, the reduction of the rate of efficiency earnings, that a true equilibrium will be re-established»⁵¹.

c. Money wage claims on the part of workers are not only ineffective for the purpose of increasing their standard of living, insofar as they are nullified by

⁴⁷ By contrast to the interpretations which imputed an implicit assumption of full employment to Keynes's TM, it should be recalled that – in writing his work – Keynes was aware that «In Great Britain, Germany and the United States at least 10 million workers stand unemployed» and that – insofar as they were involuntarily unemployed - this was a «catastrophe» (*ivi*, p. 338).

⁴⁸ *Ivi*, p. 152, italics added.

⁴⁹ *Ivi*, p. 186.

⁵⁰ In this respect, it is not acceptable the interpretation that the TM 'anticipates' monetarist arguments (cfr. T. CONGDON, *Keynes, the Keynesians and Monetarism*. Cheltenham, Elgar, 2007), nor that the logic underlying the model presented in this work presupposes a full employment equilibrium.

⁵¹ J.M. KEYNES, *Treatise on Money*, cit., p. 186.

the increase in prices on the part of firms (GRAZIANI, 2003), but they also prove to be counterproductive for workers as a whole, insofar as they are associated with increasing interest rate, the consequent decline of investments, employment, production and wages.

4 – Concluding remarks

This paper dealt with Keynes's theory of interest and wages, as established in his *Treatise on money* (TM). By contrast with the "discontinuist" reading of Keynes's work, it has been argued that the TM departs from the Neoclassical theoretical framework for two main reasons. First, Keynes conceives a capitalist economy as a *monetary economy*, where money supply is endogenous and demand-driven. This is the principal feature of his work which links it to the contemporary monetary theory of production. Second, it has been shown that Keynes stresses that capitalist dynamics (apart from its cyclical movements) tends to spontaneously produce vicious circles which can stop only by means of external intervention. This particularly applies to the working of the labour market, where unemployment derives from banks' and capitalists' decisions on (respectively) the money rate of interest and the scale and composition of output, as well on the dynamics of public expenditure. A theoretical model has been provided in order to 'rationalize' these arguments.