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The growing evidence of Keynes's methodology advantage and its consequences within the four macro-markets framework

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Abstract

Recent developments in econometrics and economic theory attest the growing evidence of strong uncertainty. The paper argues that these developments both question seriously the methodological foundations of the mainstream macroeconomics and support Keynes's powerful concepts and theory. It emphasizes how replacing 'risk' with strong uncertainty suffices to transform the standard four-macro-markets system into a shifting demand-driven system, with the result that price rigidity is not to be considered the cause of the effective demand leadership (although, as Keynes pointed out, some rigidity is required to give us some stability in a monetary economy). As it is not based on a restrictive definition of uncertainty, Keynes's theory is more realistic than the mainstream. It is also more general, for the equilibrium level of employment depends on the views about the future, instead of having a unique 'natural' anchor.

JEL classification: E00, E12, E13, B22

Keywords: General equilibrium, Uncertainty, Post-Keynesian

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"I accuse the classical economic theory of being itself one of these pretty, polite techniques which tries to deal with the present by abstracting from the fact that we know very little about the future."
Keynes, 1937, The General Theory of Employment, QJE, 51, p 215.

1. Introduction

The mainstream macroeconomics has been built from the 18th century on the postulate that the economic system obeys a 'natural' order. The modern translation of such a belief is to be found in applied econometrics. Time-series econometrics indeed aims at finding a 'data generating process' (DGP) in economic series, which requires the series to exhibit some regularity. Hence, applied econometrics usually starts by 'making the series stationary' (differentiating if needed).

The postulate that some natural order predetermines the future of the economic system and, therefore, makes the future predictable, is the very reason why optimization, especially intertemporal optimization, has been promoted in mainstream's micro and macroeconomics. These are the methodological foundations of the modern mainstream's macroeconomic model, the so called DSGE¹.

In such a conceptual framework, uncertainty is considered an epiphenomenon, a 'white noise' around the 'natural' and, therefore, predictable trajectory. Now, while econometrics has been a powerful instrument of the mainstream domination, it is becoming a major source of its weakening, for there is more and more evidence that the DGP of the period $t-n$ to t is never ensured to hold in the subsequent periods. This is clearly attested in the exploding literature on 'time varying' relations, 'shifting' / 'switching' regimes and structural change, with heavy methodological consequences (Hendry 2002, Kurmann, 2005, Hinich, Foster & Wild 2006), especially as concerns the predictive capacity of agents. Accordingly, Phelps (2007) could claim that "... if an economy possesses dynamism, so that fresh uncertainties incessantly flow from its innovative activities and its structure is everchanging, the concept of rational-expectations equilibrium does not apply and a model of such an economy that imposes this concept cannot represent at all well the mechanism of such an economy's fluctuation."

Keynes precisely conceived a general theory of equilibrium without postulating any 'natural' position or trajectory. In the absence of any anchor for expectations, decisions have to be made according to the subjective feelings about what the future will be, which implies that the collective outcome of such decisions continuously depends on the changing views about the future. Consequently, in a competitive system, Keynes's theory delivers a different equilibrium for every state of the 'views concerning the future', while

¹ See Benassy (2007) for a stylized version.

the mainstream's new synthesis only reckons the Pareto-optimal equilibrium as a result of optimal intertemporal choices². This is why *The General Theory* is basically more general than the mainstream's theory³.

According to Keynes, the influence of the changing views about the future is the ultimate criterion of differentiation of *The General Theory* vis-à-vis the orthodox theory:

"Or, perhaps, we might make our line of division between the theory of stationary equilibrium and the theory of shifting equilibrium—meaning by the latter the theory of a system in which changing views about the future are capable of influencing the present situation. [...] We can consider what distribution of resources between different uses will be consistent with equilibrium under the influence of normal economic motives in a world in which our views concerning the future are fixed and reliable in all respects;—with a further division, perhaps, between an economy which is unchanging and one subject to change, but where all things are foreseen from the beginning. Or we can pass from this simplified propaedeutic to the problems of the real world in which our previous expectations are liable to disappointment and expectations concerning the future affect what we do to-day." (Keynes, *The General Theory*, p. 293-294)

Keynesian uncertainty does not mean that agents do not try to predict the value of such and such decisive variable, but the meaning and usefulness of forward looking expectations is much weaker than the one usually supposed in the mainstream approach. Keynesian rational expectations admit that people make use of all available information of course, but whatever the kind of probabilistic tools they use, true uncertainty makes it possible for expectations to reveal eventually systematically wrong; the past events never give enough information about what the future will be (non ergodicity⁴). That is the reason why Keynes thought that decisions actually "also depend on the *confidence* with which we make this forecast—on how highly we rate the likelihood of our best forecast turning out quite wrong" (Keynes, 1936, p. 148).

Interestingly, non-Keynesian theorists admit larger definitions of uncertainty more and more, with the result that adaptive learning and expectations no more look irrational nowadays (Sargent 1999, Farmer, 2002, Evans & Ramey 2006, Preston 2006, Hansen 2007). Experimental economics also attests that, "when the environment changes continually, including the behavior of other investors, the learning process may never reach a stationary point" (Sunder, 2007). Epstein & Wang (1994) showed in a general equilibrium model of asset price determination that "uncertainty may lead to equilibria that are indeterminate, that is, there may exist a continuum of equilibria for given

² Actually, general equilibrium theorists have pointed out for a long time that gross substitution of excess demand functions must be postulated to ensure the competitive equilibrium stability.

³ See Davidson (1996, p 494) for a discussion.

⁴ Ergodicity is defined as the dynamic stability of a stochastic process; see Vercelli (1991, pp. 40, 154) and Davidson (2002, pp.39-69).

fundamentals. That leaves the determination of a particular equilibrium price process to "animal spirits" and sizable volatility may result.”⁵ There are also dynamic models based on the Rational Beliefs Equilibrium theory (RBE; see Kurz 1994, Kurz & Motolese 2001, Wu & Guo, 2003), a theory of nonstationary (therefore nonergodic) systems, where people expectations change according to their (rational) changing beliefs or theory about the economic system functioning. This approach unquestionably improves the role of uncertainty by allowing for non ergodicity, but it assumes however that agents always are confident about their expectations in spite of the fact that their theory is likely to change in the future. This is an unfortunate assumption which dispossesses uncertainty of its venom, for, as Knight pointed out from 1921, the ‘degree of confidence’ is a key concept of decision theory in uncertain contexts. The point is formally attested in the modern decision theory under uncertainty in general (see Chateauneuf, Eichberger & Grant 2007 for example), as well as in various specific fields. In their job search model, Nishimura & Ozaki (2004) showed that, while an increase in risk ("mean preserving spread of the wage distribution the worker thinks she faces") increases the reservation wage, an increase in Knightian uncertainty ("a decrease in her confidence about the wage distribution") reduces the reservation wage. Although their analysis is not about financial decisions, the intuitive reason strongly recalls Keynes's arguments on liquidity preference and inducement to invest: when uncertainty increases, people aim at reducing it by accepting a job and cancel a future search (that is by preferring a certain amount of money today, rather than an uncertain amount tomorrow). The authors also showed in a recent paper on investment (Nishimura & Ozaki 2007), that “...an increase in Knightian uncertainty makes the uncertainty-averse decision-maker more likely to postpone investment to avoid facing uncertainty”, in a way similar to Keynes views about the effects of a state of confidence decrease on the marginal efficiency of capital. In the same vein, Gomes (2007) found that “an uncertainty averse agent saves more than a risk aversion agent and this gap increases with the degree of uncertainty aversion”.

By refuting the mainstream’s restrictive definition of uncertainty and considering the decisive role to the ‘state of the confidence’, Keynes revolutionized macroeconomics, providing it with new concepts such as the liquidity preference or the marginal efficiency of capital, and new results such as the non neutrality of money and the failure of competitive forces to remove unemployment. The paper emphasizes the transmutation of the standard four macro-markets articulation that Keynesian uncertainty implies in the competitive equilibrium analysis. Section 2 shows first how the Keynesian key concepts were adapted to the mainstream’s ergodic vision of the world, and why, once amputated of their essential attributes, they were unable to change the equilibrium properties in the long run. Section 3 presents the basic general equilibrium conditions and the related macro-markets articulation, first within the mainstream’s approach, and then focusing on how Keynesian uncertainty transforms that articulation into a (shifting) demand-driven

⁵ These results were obtained with Knight's definition of uncertainty, which remains narrower than the one adopted by Keynes and, therefore, does not fully capture Keynes’s view. See Davidson (1996).

equilibrium with radically different properties. The discussion is firstly conducted for a given level of wages, but the section also addresses the issue of the wages equilibrium level. It is argued that, though some stickiness is required for any equilibrium with Keynesian unemployment to exist, wages downward rigidity is not to be taken as an unsafe obstacle to full employment at all, for flexible wages would not remove unemployment in general, and could even worsen the situation. Wage rigidity instead turns out to be the endogenous stabilizing response of institutional forces aimed at stopping the cumulative depression process which could result from flexible wages. Section 4 concludes.

2. Uncertainty in the mainstream: impoverished concepts and theory

As *The General Theory* shed so much trouble within the classical way of thinking, orthodox economists subsequently provided a (degenerated) rationale for the Keynesian key concept based on their restrictive definition of uncertainty. For example, when Keynes put forward the speculative motive of the demand for money, he thought about consequences of uncertainty and liquidity preference. Empirical evidence against the single transaction-money theory then called for a theoretical response of the mainstream economics. But the response only consisted in justifying the speculative demand for money in terms of some optimal portfolio trade-off between interest and risk⁶, not uncertainty.

Another crucial example is given by the marginal efficiency of capital, which meaning was cautiously distinguished by Keynes from the marginal productivity of capital precisely because of uncertainty. But Keynes's theory of the inducement to invest, which proved to be better than the traditional function of the interest rate, was translated in terms of 'Tobin's Q ' deviations from the equilibrium value (that is 1) within a stationary model⁷. Yet, Keynes' Q clearly departed from the ergodic vision of the world (Keynes, 1936, ch. 11, s. 2, and ch. 21, s. 1).

The damage extended to the theory of economic policy. Insofar as the ergodic axiom was maintained, and competitive forces were supposed to drive the system to the "natural" anchor at least in the long run, macroeconomic policies could at best provide a stabilisation device when nominal rigidities delay the adjustment process. In such a context, automatic monetary and fiscal rules can be formulated, since they aim merely to offset deviations from the target (the 'natural' value). But, in nonergodic regimes, rules of this type do not make sense; firstly, because there is no 'natural' target, and, secondly, because macroeconomic policy never is ensured to reach any target, though it may be successful sometimes (See Asensio 2006, 2007, 2008 for further discussion). Consequently, contrary to the view expressed by Kydland and Prescott (1977), who conclude that discretionary policy should be abandoned, macroeconomic policy can not

⁶ See Tobin (1958).

⁷ See Brainard & Tobin (1968, p 105).

be but discretionary in uncertain contexts, insofar as authorities can not seriously commit themselves to such and such objectives, though they can express intentions⁸.

Once amputated of their essential attributes Keynes's innovative concepts turned out inoffensive as regard the long run properties of competitive markets. In today's mainstream, the only way to preserve some influence to the demand side is through nominal rigidities, which only allows for temporary effects. Of course, the mainstream also can explain persistent market failures and unemployment. General competitive equilibrium theorists have shown that imperfect competition and incomplete markets may cause dysfunctions. But such dysfunctions stem from structural defects, not from insufficient demand, at least in the long run. Solutions therefore hold in reinforcing competition and creating more markets, not in stimulating the demand for goods, except when it is possible to take advantage of some nominal stickiness so as to speed up the relative prices adjustment by means of some temporary increase in the price of goods.

The reason is basically that the aggregate demand can not constrain the aggregate supply once the relative prices adjustment is completed: either, markets clear through the relative prices adjustment, or, if market imperfections prevent the optimal outcome at the collective level, the distorted relative prices and the involved individual optimal decisions make the distorted aggregate supply and demand equal, so that it remains inadequate to stimulate the aggregate demand.

Assessed at the macroeconomic level, an insufficient aggregate demand in the goods market, or, equivalently, an excess of saving, is not a stable situation in the mainstream's view, for it would trigger a decrease in the rate of interest which, simultaneously, would clear both the market for goods and the market for saving (Say's law). As the supply of goods can not be constrained by the demand, firms may therefore freely decide to hire as long as the marginal product of labour exceeds the real factor cost. In the monetary version of the theory, the fourth market, namely the money market, also contributes to the support of aggregate demand through the real balance effect and the misleadingly called 'Keynes effect'. Hence, a deficient aggregate demand can not be a cause of unemployment.

Let us now consider how uncertainty interferes with the functioning of competitive markets. In the face of uncertainty, an interest rate decrease caused by a depressed aggregate demand ('Keynes's effect'), as well as the real balance effect, may meet various obstacles. First, if the money supply decreases along with the demand for money (as stated in the endogenous money literature), which depends on the banking system behaviour, the rate of interest remains unchanged. But even if banks do not reduce the money supply, it may be that the depressive forces harm the state of the confidence in such a way that people increases the liquid-assets share in their portfolio, which would limit or inhibit both the Keynes's and Pigou's effects. In addition, the worsening business

⁸ The term 'discretionary' is taken as opposed to a commitment on some automatic rule. Hence, our argument actually rejoins Bateman observation that Keynes rejected the 'hydraulic' acceptance of discretionary policies, not discretionary policies in general (see the discussion below).

climate could deter investment projects despite the (possible) decrease in the interest rate. Thus, without considering the possible destabilizing forces that will be considered in section 3, it appears at this point of the discussion that stabilizing forces may fail.

Why doesn't the mainstream consider these obstacles? The answer is because uncertainty is not really considered, but 'risk'. Therefore, when a depression arises, people do not increase the liquid-assets share as far as the depression is considered a white noise. In the same spirit, a depression does not change the long run expected return on capital either.

The point is that Say's law only holds under the restrictive condition that the depression is considered a temporary deviation (a white noise), which postulates some regulatory forces that operates in the long run so as to anchor the economy in an imaginary 'natural' position. In the face of true uncertainty, on the other hand, the speculative demand for money tends to be too high and the inducement to invest too low, which inhibits Say's law even in competitive markets.

Such unforeseeable shifts in the demand for money also have heavy implications on the capacity of monetary policy to control the long-term interest rate. When the monetary base is increased through lower short-term rates, lower long-term bank rates boost the demand for credit only if the liquidity preference does not shift too much. Indeed, an increase in liquidity preference owed to unfavourable expectations may make banks able to sell more credit without having to reduce their interest rates, for non-bank loans rates in this case tend to rise in order to compensate the increasing liquidity preference. In addition, even when authorities do control the interest rate effectively, the possibility of unforeseeable shifts in the marginal efficiency of capital and inducement to invest would make the outcome uncertain. But, overlooking these possible obstacles, a pseudo-Keynesian theory of economic policy was developed where moving the IS and/or LM curve(s) accurately was regarded as the elementary solution to restore full employment. The mainstream then consistently developed that idea by considering that agent expectations could not ignore the future of such a simple machine, and 'inflation targeting' (say 'Non Inflationary Stabilizing Policy') provided the optimal policy rule in stochastically disturbed (though dynamically stable⁹ and therefore optimizable) regimes, as stipulated within the new standard DSGE modelling.

3. Markets articulation in the mainstream and in *The General Theory*

According to the discussion above, it turns out that the mainstream never digested the essential aspects of *The General Theory*, that is, the ability to fairly consider the consequences of true uncertainty. Moreover, these consequences do not concern the money demand and investment functions only, they also make money non neutral and remove Say's law by the way. It is eventually the macro-markets articulation which is radically transformed.

⁹ The dynamic stability of a stochastic process is known as ergodicity; see Vercelli (1991, pp. 40, 154) and Davidson (2002, pp.39-69).

Markets articulation according to the mainstream

The basic mainstream's general equilibrium supposes a set of compatible conditions between the aggregate supply and demand in every macro-market, given the capital stock and the "market structures" (technology, preferences, degree of competition...). Note that the Walras law ensures that the bonds market equilibrium conditions hold if the three remaining markets conditions hold. If the money supply is assumed to be exogenous (the case for endogenous money is discussed below), the general equilibrium conditions therefore reduce to five: the supply and demand of labour conditions, the supply and demand for goods conditions, and the money market clearing condition (Table 1 below).

Table n° 1: The basic mainstream's model equilibrium conditions (exogenous money)

Labour market ($\rightarrow N^*, w^*$)	$f'_N(N, K) = \frac{w}{p}$	(1) Demand: marginal productivity equalization to the real labour cost
	$N = N_s \left(\frac{w}{p^e} \right)$	(2) Supply: marginal disutility of labour equalization to the expected real wage
Goods market ($\rightarrow Y^*, i^*$)	$Y = f(N, K)$	(3) Supply: production function (constant capital in the short run, diminishing marg. prod.: $f'_N < 0, f''_N > 0$)
	$Y_d(i - \dot{p}^e) = Y$	(4) Aggregate demand
Money market ($\rightarrow p^*$)	$M = L(Y, p, i)$	(5) Market clearing condition; by setting the quantity of money, the central bank controls p and can (temporarily) impact the demand for labour and the supply of goods through inflation surprises: p / p^e
Bonds market	Implicit	Walras law

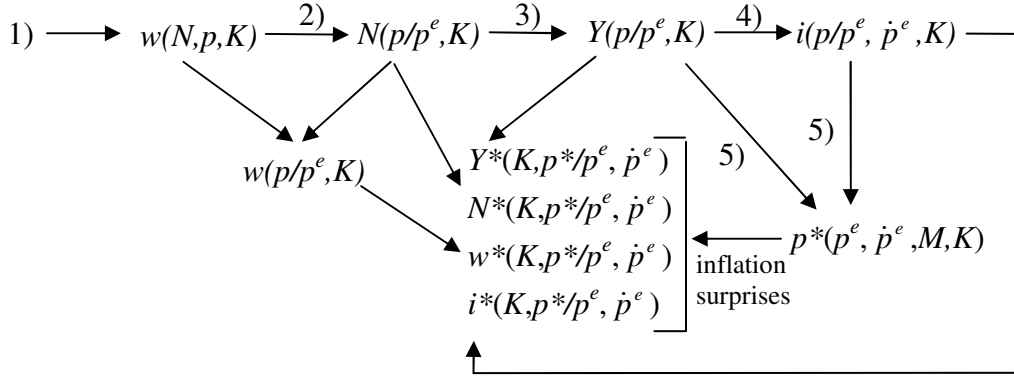
N is the level of employment
 w is the nominal wage
 p^e is the expected current price index level
 $\dot{p}^e$ is the expected inflation
 Y is the output level
 K is the stock of capital (constant)
 i is the nominal rate of interest
 M is the quantity of money

The model includes five endogenous variables: Y, N, w, p, i which depend on the exogenous variables K, M, p^e and $\dot{p}^e$.¹⁰ It lends itself to an analysis in terms of aggregate supply and aggregate demand: combining equations (4) and (5) (similar to the IS-LM conditions) gives the aggregate demand equation $Y(p, \dot{p}^e, M)$, which may be written $p(Y, \dot{p}^e, M)$; equations (1), (2), and (3) give the aggregate supply equation $Y(p/p^e, \dots)$. Resolution yields Y and p , which permits to solve for N by (3), then w by (2), and finally i by (5).

However, the output variations do not really depend on current price index variations, but on the current price index error of prediction. It is through p/p^e that demand shocks and unexpected policies may influence aggregate supply and employment in the short run. This is an essential feature of the modern mainstream theory. The system indeed behaves differently depending on whether the expected price index matches the effective index (which is supposed to be true in the long run¹²) or not (which may be true in the short run). In order to explain that, let us suppose that contracts have been negotiated at the starting point of the period on the basis of the expected current price index (p^e). Hence, an unexpected increase in p will reduce the real wage and therefore will increase the demand of labour (equation 1). The competitive pressure then increases w (less than p) and pushes the workers to increase the supply of labour, insofar as they are expecting higher real wages (equation 2). Thus, non expected inflationary shocks, which depend on the quantity of money for the moment (equation 5), influence the level of employment through the prediction error (p/p^e).

¹⁰ The endogenous determination of p^e , $\dot{p}^e$ and M are discussed below.

The mainstream aggregate markets articulation in the short run^a
(exogenous money)



^{a)} Bracketed numbers refer to equations in Table 1. Y^* , N^* , w^* , p^* and i^* are the equilibrium solutions.

figure n° 1

In recent versions of the "new consensus", monetary policy controls the rate of interest rather than the quantity of money, which is consequently considered an endogenous variable (see Romer, 2000)¹¹. In that case, the output level (Y) is determined by the sole IS function (equation 4), depending on the rate of interest set by monetary authorities. Then we can get N by (3), w by (2), p by (1) and finally M by the function LM (equation 5), which indeed is not required for determining real magnitudes (figure n° 2)¹².

The mainstream aggregate markets articulation in the short run
(endogenous money)

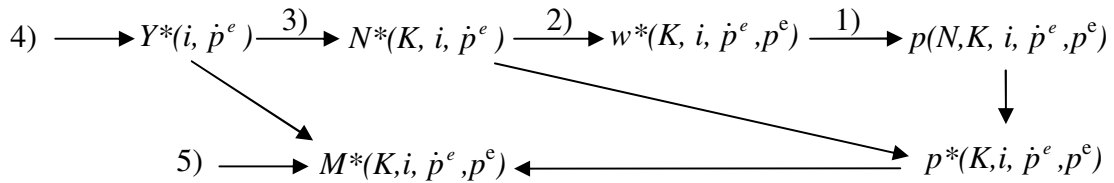


figure n° 2

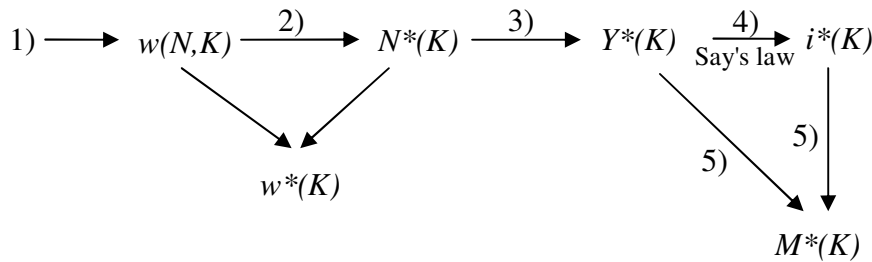
¹¹ This assessment of endogenous money differs from the Post Keynesian one which is rooted in the credit nature of money (see Palley, 2006a).

¹² Notice that employment is determined by conditions which involve the goods market, whereas prices are determined by conditions involving the labour market. While it disappears in the long run (see below), this property will be found in the Keynesian modelling, but with a quite different meaning, as stated below.

Although this functioning gives a leader role to monetary-managed aggregate demand, it is fundamental to remember that it only holds temporarily; it works conditionally to inflation surprises that can not be systematically reproduced over the long period, since they would be expected (when $p^e = p$, which is assumed to be true over the long period as a result of rational expectations in an ergodic stationary regime, prices do not interfere with employment and output determination since they do not influence the real wage). Assuming therefore that authorities do not attempt (inconsistently) to get permanent extra output through systematic inflationary shocks, monetary policy can be supposed to announce a target and respect it over the long period. As long as the commitment is credible, people expect the announced target.

As a matter of simplicity, let us suppose that monetary authorities aim to stabilize the price index over the long period. Hence, $\dot{p}^e = 0$ and, by normalizing the price index to 1, we get $p^e = 1$. In that case, the articulation of markets reveals perfectly classical over the long period: the labour market determines the level of nominal wages (equation 2) and employment (equation 1) as functions of the capital stock (given technology, endowment and preferences). Then equation (3) yields the output level (as a function of the capital stock). The interest rate follows by (4), so as to adjust the aggregate demand to the supply of goods (Say's law). Finally, equation (5) gives the (endogenous) money quantity which is consistent with the stationary conditions and prices stability.¹³

The mainstream aggregate markets articulation over the long run ^a



^{a)} Notice that, since $p=1$ and $\dot{p}^e = 0$, w and i can be interpreted as the real wage and the real interest rate.

figure n° 3

Finally, in the long run: a) employment is exclusively determined in the labour market, b) output and interest rate are determined in the goods market, conditionally to the labour market outcomes, and c) money is necessary endogenous, for a stationary regime requires a predictable price index trajectory (remember that $p=p^e$ must hold), and such a predictable trajectory, even the "zero inflation rate", puts a condition on the quantity of

¹³ It is of interest to note that this long run endogenous monetary policy implies that, over the long period, the real rate of interest is at the "natural" (stationary) level, though it may temporary deviate in the short run (when $p \neq p^e$), as popularized in the literature on "Taylor's rule".

money, directly (authorities adjust the quantity of money so as to reach the target over the long period, and then the interest rate adjusts endogenously to the "natural rate" over the long period), or indirectly (authorities adjust the interest rate to the "natural level" over the long period, and then the quantity of money endogenously clears the market).

Remark

There can be many price index trajectories over the long period in the theory, depending on the inflation target. Insofar as the nominal interest rate is the real rate plus the rate of expected inflation (which is the effective rate of inflation over the long period), it follows that the monetary regime, as defined by the inflation target, influences the natural nominal rate of interest (but not the natural real rate of interest).

Markets articulation in The General Theory

A crucial feature of *The General Theory* is that, because of the sensitivity of the demand for money mentioned in section 2, the long-term interest rate neither tends to adjust the demand for goods to the output level nor is under the direct control of the central bank. The equilibrium long-term interest rate depends on the market conviction about the equilibrium level, for any lower (higher) level would increase (decrease) the speculative demand for money as a result of pessimistic (optimistic) expectations about the future price of non-monetary assets. The long-term rate of interest therefore 'is a highly conventional [...] phenomenon. For its actual value is largely governed by the prevailing view as to what its value is expected to be. Any level of interest which is accepted with sufficient conviction as *likely* to be durable *will* be durable; subject, of course, in a changing society to fluctuations for all kinds of reasons round the expected normal' (*The General Theory*, p. 203). According to Keynes's view on uncertainty, such a conventional interest rate has no objective or 'natural' anchor and must be considered an exogenous variable, unless any specific context is under examination.

As it is not ensured that the markets can adjust (or be adjusted by the monetary policy) so as to push the aggregate demand up high enough, firms may be obliged to adjust their output and demand of labour to the level of *effective demand*. When he presents the 'principle of effective demand', Keynes provisionally supposes constant money wages because it makes it easier to show how the demand side determines the equilibrium level of employment: "[...] we shall assume that the money-wage and other factor costs are constant per unit of labour employed. But this simplification, with which we shall dispense later, is introduced solely to facilitate the exposition. The essential character of the argument is precisely the same whether or not money-wages, etc., are liable to change" (*The General Theory*, p. 27).

Let us therefore assume provisionally that the exogenous nominal wage is exogenous and consider the effective demand effects over the markets articulation. Equation (4_k) in table n° 2 exhibits both, the role of the marginal efficiency of capital schedule, which varies with all factors influencing the expected return on capital (including expected

inflation), and the privileged influence of the current income on consumption¹⁴, given the conventional interest rate. As firms can not sell more goods than it is demanded, the demand of labour will not be determined by equation (1), but by equation (3), which gives the variation in employment that makes the better use of the technology *given the level of the demand for goods*. Hence, if Y^* is determined by the aggregate demand principle (equation 4_k) and if, given Y^* , N^* results from the available technology (equation 3), then equation (1) no more is required to determine N^* . This does not mean that firms can not adjust the marginal productivity of labour to the factor real cost, but only that it is not through the employment level that they can do it. Equation (1) actually gives the price index variation that makes firms able to remain on their demand curve of labour when the demand of labour is determined in accordance with the demand of goods¹⁵. If the demand increases, it is through inflation that the real wage variation is made equal to the marginal productivity decline. Notice that inflation may be caused by an interest rate decrease through the impact on the demand and output levels, but in contrast to the modern mainstream macroeconomics, this impact does not require inflationary surprises.

As the level of labour is determined by firms on the demand side, the supply side equation of the labour market could be expected to determine the equilibrium wage. But as we have provisionally supposed that the wage is exogenously given, equation (2) is replaced by the condition (2_k). Hence, if aggregate demand and employment are not large enough, some workers have no job at equilibrium, even if the marginal disutility of labour is smaller than the real wage; in short, there is unemployment owing to insufficient demand for goods¹⁶.

¹⁴ The propensity to consume hypothesis results from the evidence that valuation of future revenues is subject to strong uncertainty, so that standard optimization does not work.

¹⁵ According to equation (1) in table 2, an increase in effective demand and employment increases the price index level as far as $f_N'' < 0$ (as in the previous section, we only consider the case for diminishing returns). This shows that cost pushed inflation and demand led inflation may express the same reality. In fact, whatever apparent causes it has, inflation always requires an increase in demand, for inflationary effects associated to wages and/or mark-up pressures depend on the way monetary authorities will pass them on effective demand. Insofar as higher demand for transaction money comes with cost pressures, inflation develops if the banking system satisfies the additional demand of money. But if the central bank raises the short term interest rates so as to stabilize the price index, banks will increase the long term rates, and less (credit) money will eventually be delivered.

¹⁶ The reader should not conclude too quickly that this results from the assumption that wages are exogenous (as it will be argued below).

Table n° 2: Keynesian shifting equilibrium conditions
(endogenous money, exogenous wages)

Goods market ($\rightarrow Y^*, p^*$)	$Y = Y_d(Y, i, E)$	(4 _k) Effective demand drives aggregate supply ^{a)} . The marginal efficiency of capital schedule (E , exogenous) may shift according to the views about the future (including $\dot{p}^e$)
	$f'_N(N, K) = \frac{w}{p}$ $\Leftrightarrow$ $p = \frac{w}{f'_N(N, K)}$	(1) marginal productivity equalization to the real labour cost provides a mark-up price equation ^{b)} ('1 st classical postulate' holds)
Labour market ($\rightarrow N^*, w^*$)	$Y = f(N, K)$ $\Leftrightarrow$ $N = g(Y, K)$	(3) Demand: short run production function (diminishing marginal product of labour, given capital stock)
	w is exogenous	(2 _k) Excess of supply ('2 ^d classical postulate' rejected), except if aggregate demand is high enough.
Money market ($\rightarrow M^*$)	$M = L_k(Y, p, i)$	(5 _k) Market clearing condition (exogenous interest rate $\rightarrow$ endogenous money supply); the demand L_k is subject to shifts in the state of confidence $\rightarrow$ CB imperfectly controls i .
Bonds market	Implicit	Aggregate balanced budgets ^{c)}

^{a)} As it is not essential for our purpose, we overlook variables such as public expenditures and taxes.

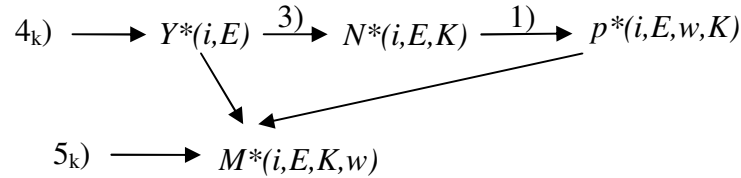
^{b)} Competitive imperfection such as monopoly power is not necessary for a mark-up relation to appear.

For example, with the familiar Cobb-Douglas technology: $f(N, K) = AN^\alpha K^{1-\alpha}$, $0 < \alpha < 1$, we get

immediately $\frac{w}{f'_N(N, K)} = \frac{1}{\alpha} \frac{wN}{Y}$, where $\frac{1}{\alpha}$ represents a mark-up on the unit labour cost.

^{c)} In the mainstream approach, the aggregate balanced-budgets equality results in the Walras law. But as Davidson (1994, p. 178) pointed out, market clearing is a sufficient condition for market equilibrium; it is not a necessary condition. In Keynes's approach, markets, especially the labour market, may be at equilibrium without having cleared.

Keynes's aggregate markets articulation (endogenous money, exogenous wages) ^a



^{a)} The shifting nature of the model lies in the shifting nature of E and in the effect of the shifting liquidity preference on i .

figure n° 4

Interest and wage determination: the stabilizing role of institutions

The effective demand principle would be limited to a mere temporary phenomenon if wage flexibility was able to straighten the aggregate demand in all circumstances; the supply side would dominate eventually. That had to become the mainstream's position, and could disastrously turn out official¹⁷. But, just as the interest rate does not adjust automatically so as to ensure Say law, wages flexibility hardly could restore the effective demand systematically to the full employment level. As far as the 'invisible hand' fails to implement the optimal equilibrium, real wages are higher than the marginal disutility of labour (equation (2) in table n° 1, which represents the "second Classical postulate", does not hold). That suggests that competition between workers will reduce the nominal wages. But, although such a mechanism sometimes works to some extent, it may fail to remove unemployment and even make things worse because of possible negative effects on the demand side, especially through the marginal efficiency of capital (*The General Theory*, 1936, ch. 19). When the wages decrease does not stimulate the effective demand, or even does amplify the depression¹⁸, wages continue to fall towards zero until workers are able to stop the decrease in wages, unless the depression in output and prices succeed in pulling the demand for money and the rate of interest in such a way that the effective demand eventually reach the full employment level. In the most favourable case where it stimulates the effective demand, wages flexibility can remove unemployment completely,

¹⁷ In his paper 'Integration of growth and cycle: an alternative view of the history of macroeconomics' Yamazaki (2006, p 123) wrote: Keynes overemphasized short-term fluctuations of economy or business cycles... The apparently lost viewpoint of growth, however, was revived beneath the surface of the circle view [...]. Following a period of ferment and confusion, what is called real-business cycle theory integrated the two viewpoints [...]. In the minds of macroeconomists, the conflict among schools is now a thing of the past. I argue that we historians of economics must also change our perspective as we describe our histories of macroeconomics."

¹⁸ Expectations of further wages decreases tend to delay investments. See Tobin (1975) and Palley (2006b) about the cumulative depression involved in such a context. Those authors also emphasize a potentially destabilizing effect owing to the 'Fisher' effect.

either by itself, or, possibly, with the help of the interest rate. That is the only eventuality the mainstream considers. But, in the Keynesian theory, it is only one out of many less-happy outcomes which depend on the level where the state of confidence, together with workers ability to resist, fixes the effective demand and, therefore, the equilibrium level of employment.

These results show that there is no, strictly speaking, flex-price competitive equilibrium with Keynesian unemployment, as Keynes himself stated: "If [...] money-wages were to fall without limit whenever there was a tendency for less than full employment, [...] there would be no resting-place below full employment until either the rate of interest was incapable of falling further or wages were zero. In fact we must have *some* factor, the value of which in terms of money is, if not fixed, at least sticky, to give us any stability of values in a monetary system.' (*The General Theory*, 1936, p. 303-304). But that is not to say that flex-price competitive markets ensure full employment, nor is it to say that the cause of unemployment holds in the rigidity of prices as stated in the Benassy (1984)-Malinvaud (1980a,b) range of models (in this literature, it was argued that flexible prices would eventually lead the economy toward the Walras outcome)¹⁹. In Keynes's economics, flex-price markets do not remove unemployment necessarily, and may even increase it. Nominal rigidities in this case are not the cause of unemployment, but the necessary stabilizing consequence of a vicious circle of increasing unemployment and decreasing wages. Contrasting with the orthodox macroeconomics, where competition induces flexible wages and optimal employment level, in the Keynesian uncertain world, competitive forces may induce rigid money-wages and unemployment.

4. Conclusion

Keynes's *General Theory*, besides being able to explain the widest range of unemployment situations in competitive systems, finally suggests that competitive forces trigger institutions responses which aim at preserving the economic systems against cumulative depression and instability. Resistance of unions and macro-policy support are the more visible and direct of these responses. Keynes's approach to competitive economies invites to investigate the way those institutional forms interact with each other in producing durable stability and confidence, for it could be a better way to reach high levels of employment and output than unbridle competitive forces.

¹⁹ In Malinvaud (1980) however prices flexibility could produce a cumulative depression in case of unemployment, but that result was obtained within a two-market economy (labour and goods). The cumulative process resulted from the assumption that the decrease in prices produced by the supply excess of goods is stronger than the decrease in wages (hence the real wage increases, so that firms reduce the production level), without any consideration for the stabilizing 'Keynes effect' that would have been triggered in the presence of a money market. In Keynes theory, on the other hand, the so called Keynes's effect may be countered in case of a shift in the state of confidence and in the liquidity preference.

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