

# Asymmetric price adjustment: the missing link in Keynesian macroeconomics<sup>1\*</sup>

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## Abstract

In the real world, prices do not behave symmetrically. Usually, nominal wages and prices are sticky downward but a lot more flexible upward; the latter is illustrated by inflationary and hyperinflationary processes.

However, most mainstream economics is built upon the assumption that nominal prices are equally flexible *in both directions*. This leads to quite unrealistic and erroneous predictions as far as downturn in economic activity is concerned.

Given price asymmetry, it is necessary to do separate analyses: on one hand, full-employment macroeconomics (price equilibrium macroeconomics) and, on the other, the macroeconomics of recession and depression (Keynesian macroeconomics). Prices play a role in the first case, but not in the second one.

The present paper aims at pointing out the need for reconstructing macroeconomics from a realistic point of view. It argues that price downward stickiness must be a fundamental assumption in any economic model which tries to explain and predict real-world market behavior as well as recommend economic policies. It also claims that Keynesian macroeconomics has to be the point of departure of a realistic reconstruction of macroeconomic theory. Finally, it maintains that price downward rigidity fits perfectly well the Keynesian model, while this does not happen with either the New Keynesian or the Post-Keynesian models.

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**Keywords** Keynes; price asymmetry; realism; unemployment

## 1. Introduction

“Most macroeconomics of the past 30 years was spectacularly useless at best, and positively harmful at worst” (Paul Krugman, *The Economist*, July 18-24, 2009: 58).

In the real world, prices do not behave symmetrically. Usually, nominal wages and prices are sticky downward but a lot more flexible upward; the latter is illustrated by inflationary and hyperinflationary processes.

“As documented by many authors for many countries (e.g. Cover, 1992), positive demand shocks give rise to inflation without affecting output significantly, while negative ones reduce output without affecting inflation” (Dobrynska, 2008).

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<sup>1</sup> With this article I try to pay homage to the late Argentine economist Julio Olivera who passed away in 2016. From him I learned the critical role that price asymmetry plays in today's real world economy.

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In fact, examining quarterly U.S. post-war data, Cover (1992) concluded that positive shocks in the money supply have had no effect on output, whereas negative shocks reduced output. De Long and Summers (1988) had reached similar conclusions in their investigation of annual pre- and post-Second World War U.S. data. The same results were obtained by Rhee and Rich (1995) and Karras and Stokes (1999) for European countries, by implementing the method regarding asymmetry first introduced by Cover (1992).

After studying over 240 markets for consumer and producer goods, Peltzman (2000) concluded prices rise faster than they fall, and price asymmetries are persuasive, substantial, and durable and exist in periods of low inflation and high inflation. The author asserted that

“This asymmetry is fairly labeled a ‘stylized fact’. This fact poses a challenge to theory. The theory of markets is surely a bedrock of economics. But the evidence in this paper suggests that the theory is wrong, at least insofar as an asymmetric response to costs is not its general implication” (Ibid.: 493).

So, it is a very well-established empirical regularity that positive shocks have a tiny effect on output and they basically pass to prices, while negative shocks are, to a larger extent, passed to output. Nominal prices are sticky-down and the main effect of a negative shock is absorbed by output.

However, most mainstream economics is built upon the assumption that nominal prices are equally flexible in both directions. This leads to quite unrealistic and erroneous predictions as far as downturn in economic activity is concerned. In fact, what we usually see – and empirical evidence corroborates – is that, in the presence of a negative shock, quantities – not prices – fall. However, if nominal prices are downward rigid, they cannot clear markets in the presence of an excess supply, as is usually assumed in mainstream economics.

Given price asymmetry, it is necessary to do separate analyses: on one hand, full-employment macroeconomics (price equilibrium macroeconomics) and, on the other, the macroeconomics of recession and depression (Keynesian macroeconomics). Prices play a role in the first case, but not in the second one; the mechanisms at work in the first case are quite different from the ones in the second case.

Since the 1970s, macroeconomic theory has been developed under the implicit assumption that the main economic problem is inflation. However, unemployment is now back and it should be given at least the same importance as inflation received in the research agenda during the last 50 years.

The present paper aims at pointing out the need for reconstructing macroeconomics from a realistic point of view. Why do we need realism in economics? There has been a long-lived discussion on the subject of realism in economics. Its main milestones have been Milton Friedman’s contribution in his 1953 essay “The Methodology of Positive Economics” and Paul A. Samuelson’s response 10 years later in “Problems of Methodology: Discussion”.

In their famous manifesto from June 2000, the Parisian graduate students who led the struggle against “autistic science” complained, “This disregard for concrete realities poses an enormous problem for those who would like to render themselves useful to economic and social actors.”

The main fact that must be taken into consideration is that economics, and especially macroeconomics, are supposed to be a guide for economic policy. This is the context in which the issue of realism must be discussed. Let us give a simple example of what happens when we use unrealistic assumptions.

If we assume that lions are herbivorous, we will predict that any human being will be safe in the presence of a lion. Unfortunately, for the human beings in the real world, lions are carnivorous. That assumption may be useful to depict what an ideal world of peaceful coexistence between both species would be, but it is a very dangerous guide for human being action.

In the same way, many assumptions in mainstream economics are adopted only because they facilitate the analytical treatment of the problem; in some others, it is just because of elegance.<sup>2</sup> As with the case of the lion, those assumptions unfortunately lead to predictions far away from what happens in the real world and with equally tragic consequences, as the 2008 crisis pointed out. Mainstream economic theory did not even consider the possibility of the type of collapse that the subprime mortgage meltdown unleashed, let alone the appropriate ways to deal with it.

It is true that the premises of any economic model are always “inexact” because they abstract of numerous causal factors that are present besides those effectively taken into consideration. This is the method used in all sciences when there is a complexity of causal factors (Hausman, 1992: 148).

As Mäki (2005: 304) rightly states,

“...models serve as ‘substitute systems’ of the target system they represent. They are substitute systems in the sense that one does not directly examine the target systems, rather one focuses on the properties and behavior of the representatives as substitutes of the targets.”

The target system is too complex to be understood in its entirety, so a simpler model is constructed to explore it (Hodge, 2007: 26). However, not just any substitute system will do; the representative model must adequately resemble the target system where “adequately” depends on the intention or purpose of the model (ibid). As Mäki asserts, “thought experiments” replace the “material experiments” of the natural sciences.

Therefore, by definition, every model implies a certain degree of unrealism in its assumptions – it is a simplification of the real world. But it is one thing to simplify reality and quite another to overtly tergiversate it. The representative model must resemble the target system.

I have referred elsewhere (Beker, 2015) to several of the unrealistic neoclassical assumptions (price symmetric flexibility, unbounded rational expectations, no coordination problems, the representative agent, *etcetera*).

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<sup>2</sup> Of course, there is also an ideological component. As De Vroey (2011: 7) points out, “The split is between those who want to give competition its full rein, the defenders of the self-regulating characteristics of markets (or ‘free marketers’) and those, the Keynesians, who think that the market economy, although the best economic system, can buttress failures, in particular an insufficiency in aggregate demand, which it is the state’s role to remedy.”

This time, I deal with the price flexibility assumption. This paper argues that price downward stickiness must be a fundamental assumption in any economic model which tries to explain and predict real-world market behavior as well as recommend economic policies.

I go on arguing that realisticness is precisely one of the features that distinguishes Keynes' unemployment analysis. For this reason, Keynesian macroeconomics has to be the point of departure of a realistic reconstruction of macroeconomic theory. Keynes' economic theory was designed to explain the causes of the 1930s economic crisis and fight against its consequences. In principle, this theory seems better equipped to deal with subjects like unemployment, recession, and depression than the neoclassical one, which does not even consider a deep crisis as a possibility.

I add that price downward rigidity fits perfectly well the Keynesian model, while this does not happen with either the New Keynesian or the Post-Keynesian models.

The rest of the paper is organized in the following way. Section 2 is devoted to arguing that in the real-world price behavior is not at all symmetric. In Section 3 the superiority of Keynesian economic theory is defended because of the realisticness of its assumptions. Section 4 is devoted to presenting the essence of the Keynesian model. In Section 5 a distinction is introduced between price and non-price equilibrium economics. Section 6 and Section 7, respectively, present the New Keynesian and Post-Keynesians contributions and the reasons why they should not be considered truly Keynesians. In Section 8 the microeconomics behind the Keynesian macroeconomic model is introduced. Section 9 discusses why prices do not fall when there is excess supply. In Section 10 I introduce what I call the Fundamental Microeconomic Assumption. Section 11 is devoted to the analysis of price asymmetry on the wealth effect. Section 12 reviews the discussion on the Phillips curve, while Section 13 is devoted to the analysis of the impact that the appearance of the phenomenon of stagflation in the 1970s had on economic theory. Section 14 makes a short review of Keynes' monetary and fiscal policies. Section 15 briefly discusses price stickiness in the European crisis. Section 16 concludes.

## **2. Price symmetry is not a realistic assumption**

In the real world, price behavior is not at all symmetric. It is a curiosity that even Friedman (1953: 165) recognized that asymmetry: "At least in the modern world, internal prices are highly inflexible. They are more flexible upward than downward." He did it in the context of an argument in favor of flexible exchange rates but he ignored it when dealing with goods market clearing.<sup>3</sup>

Asymmetry in price behavior requires one approach to analyze an economy in full-employment and another one to study an economy facing unemployment.<sup>4</sup> We need an economic theory that can explain involuntary unemployment but which, at the same time, allows for the existence of inflation.

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<sup>3</sup> Had he taken into consideration downward stickiness in his monetary analysis he would have arrived to the non-monetary theory of inflation, developed by Latin American economists using precisely that assumption to arrive at a theory of inflation opposed to Friedman's one.

<sup>4</sup> This is something I have been insisting since long ago. See Beker (1985).

In traditional mainstream economic theory there is no room for involuntary unemployment. As wages are assumed to be downward flexible any labor market surplus will be removed by a fall in nominal wages.

### **3. Realisticness and Keynesian macroeconomics**

Realisticness is precisely one of the features that distinguished Keynes' analysis. Keynes was a practical-minded economist. In contrast to many past and present economic theorists, he had great practical experience in economic policy. He did use simplifications of economic reality—the propensity to consume is one of them—but they allowed him to reach significant practical results. Recovering the original Keynes' legacy and pointing out its relevance to deal with current economic problems is the starting point for a realistic economic theory. Let me emphasize: I'm just talking of the point of departure. Of course, many things have changed since Keynes published his *General Theory* in 1936, and there are also some gaps in his reasoning that need to be filled.<sup>5</sup> In this paper I just want to argue that Keynes' approach to macroeconomics is still a relevant model of how to deal with economic issues. Taking it as a departure point, a research program has to be developed in order to update Keynesianism to the 21<sup>st</sup>-century realities.<sup>6</sup> But as in any building, foundations play a decisive role. I argue here about the foundations of macroeconomics and, particularly, on the role of the asymmetric price behavior in them.

While Keynesian macroeconomics considers full employment as a particular and unusual case, mainstream neoclassical macroeconomics deals only with full-employment macroeconomics. Many of its predictions and recommendations are flawed because they are based on the assumption that prices are downward flexible. They resemble the recommendations made for a world where lions are herbivorous.

### **4. Keynesian macroeconomics**

Let us make a quick review of Keynes' ideas. This is necessary in order to distinguish what Keynes really contributed to the economic analysis from what the anti-Keynesians and the different kinds of "Keynesians" interpreted. The starting point of Keynesian macroeconomics is that the labor market does not necessarily clear. There is no self-adjusting mechanism in the labor market that ensures full employment. This has been the key contribution from Keynes. The most likely situation in the labor market is one of involuntary unemployment, where labor supply exceeds labor demand.

Involuntary unemployment has nothing to do with real wage rigidity; for Keynes there is no real wage rigidity. On the contrary, as Keynes argued, although workers will usually resist a nominal wage reduction, they will not resist moderate reductions in real wages because of an increase in prices (Keynes, 2016: 13). While nominal wages are downward rigid, real wages are flexible.<sup>7</sup>

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<sup>5</sup> Some of them are mentioned in Section 14.

<sup>6</sup> The globalization and financialization processes as well as the role of supranational institutions are some of the new realities an updated macroeconomics has to take into consideration.

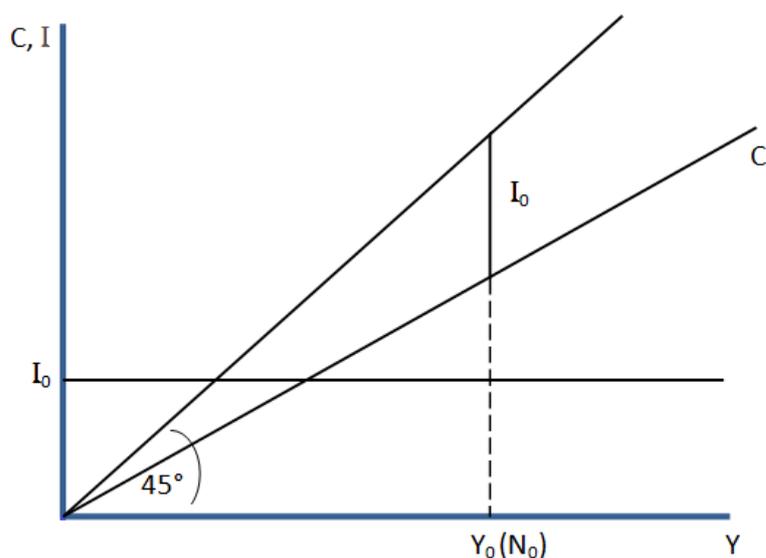
<sup>7</sup> For a discussion of this issue, see Beker (2015).

The huge fluctuations in employment studied by Keynesian macroeconomics are related to fluctuations in the level of output, not with the level of real wages.

In the same way, Keynes also disregarded the role of prices in eliminating any discrepancy between aggregate supply and demand. The equilibrium<sup>8</sup> in the goods market is attained when demand (consumption plus investment) equals aggregate supply. If there is a general glut, firms would reduce their supply (and employment), not prices, until equilibrium is reached.

Investment ( $I_0$  in Figure 1) plays a key role in determining the level of employment. Employment is determined in the goods market at the intersection point between the aggregate supply and aggregate demand for goods ( $Y_0$ ).

**Figure 1** Equilibrium in the goods market



Fluctuations in investment are responsible for fluctuations in aggregate output ( $Y$ ) and thereby in employment.

In short, the aggregate demand function is

$$D(N) = C(N) + I \quad (1)$$

where  $N$  is the level of employment,  $C(N)$  is consumption, and  $I$  is investment. The equilibrium in the goods market requires excess aggregate demand to be zero at some level of employment:

$$D(N) - Y(N, K_0) = 0 \quad (2)$$

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<sup>8</sup> I use equilibrium with the usual meaning: a state where there is no economic force which can change the value of economic variables.

where  $Y(N, K_0)$  is the aggregate supply function for a given level of capital stock  $K_0$ . So, employment is determined as the inverse of the excess demand function for given values of investment, namely the exogenous variable:

$$N = g(I, K_0) \quad (3)$$

Given the organization, equipment, and technique of production, employment is a function of the level of investment. Unfortunately, no mechanism guarantees the level of investment will be the one that leads to full employment.

If  $Q = h(N, K_0)$  is the aggregate production function and  $Y = Q \times p$  where  $p$  is the general level of prices, the real wage is given by:

$$w/p = Q_N(N, K_0) = h_N(I, K_0) \quad (4)$$

where  $w$  is the nominal wage and  $Q_N(N, K_0)$  is the marginal productivity of labor for a given level of capital  $K_0$ .

The real wage rate is a function of the level of employment or, ultimately, of the level of investment.

## 5. Non-price equilibrium economics vs. price equilibrium economics

In the previous section, no role was ascribed to prices in reaching equilibrium. In orthodox economics they are the magic instrument that clears markets.

In Keynesian macroeconomics, quantities (income, consumption, investment, savings, et cetera) are related to other quantities, while the role of prices is de-emphasized.

For example, in the Keynesian model, a decline in the investment goods demand would have a direct impact on the level of the aggregate output *via* the multiplier. The reduced level of investment will equal the level of saving at a lower rate of interest. The fall in the rate of interest will only have a second-order effect on the level of consumption, if any.

On the contrary, in the neoclassical model the fall in investment would be followed in the first place by a decline in the rate of interest, which will stimulate consumption. Therefore, the level of aggregate demand will remain unchanged: only its composition would change.

Phelps (1970) and Lucas (1976) introduced the need for proper microfoundations in macroeconomics. By that they understood the use of the Walrasian microeconomics from the *Arrow and Debreu model*, where prices are the tool that clears all markets including the labor market. The Walrasian general equilibrium model is the cornerstone of mainstream economics which, for that reason, should be called *price equilibrium economics* – not just equilibrium economics, as Lucas baptized it.

Once the price clearing markets assumption is introduced in macroeconomics the possibility of involuntary unemployment disappears. Excess labor supply will push wages down until unemployment vanishes.

The main difference between the Keynesian and the Walrasian approach is that adjustments are made *via* quantities in the former, while they are made through prices in the latter.

If you accept the Walrasian approach, prices clear all markets. If so, wage/price stickiness seems to be the only line of defense available to justify Keynesian unemployment in a Walrasian context; the New Keynesians resorted to it.

## **6. The New Keynesian contribution**

The New Keynesian program was mainly interested in proving the non-neutrality of money in the short run. If money is not neutral, its expansion or contraction will have an impact on output, at least in the short run; then, there is a role for monetary policy. This is the point New Keynesians were interested in making. For this purpose, the New Keynesians needed a microeconomic model in which prices would not respond to excess supply or demand. Their starting point had to be imperfect competition, which implies that firms set prices and the demand chooses quantities. Thus, changes in demand always cause changes in output in the same direction.

They had empirical support in Blinder et al (1998). Blinder and his colleagues interviewed, between 1990 and 1992, two hundred randomly selected firms about their pricing behavior. They collected “what may be the first evidence on price stickiness ever derived from a random sample of the whole economy” (Blinder, 1994: 120). Moreover, this stickiness did not appear to be asymmetric.

From the theoretical point of view, there were several theories arguing why prices might be sticky. For instance, Ball and Mankiw (1994) use a menu cost model to explore a possible explanation for price adjustment asymmetry. In order to sell their products, firms have to write prices on menus, catalogues, and tags; changing prices may be rather costly. If we assume positive trend inflation, a firm that wants to lower its relative price may save the menu costs just waiting for inflation to do the work. However, as Mankiw (1985) himself had already admitted, these menu costs are small and, therefore, they provide a very weak foundation for fixed-price models.

It is true that menu costs are usually small but it is also true that in an inflationary context, inflation may itself adjust relative prices. The real argument for price asymmetry is not menu costs but the fact that if you need to reduce a relative price, you can rely on inflation to do it. You do not need to change the price: time will do the job. With trend-expected inflation, prices are sticky when a firm's optimal price falls. Note that it is the presence of trend-expected inflation that generates the asymmetric price response. This is an important reason for price adjustment asymmetry in the real world.

Another New Keynesian argument is coordination failure (Stiglitz, 1999; Cooper and John, 1988; Ball and Romer, 1991). Stiglitz argues that the risks associated with wage and price adjustments may well be larger than those associated with output adjustments, at least for goods that could be stored. Stiglitz develops this and other arguments, but all of them have to do with symmetric rigidities. The same can be said about the article by Cooper and John as well as about Ball and Romer's paper that unify the coordination failure and the menu costs approaches.

With Ball and Mankiw's article as the only exception, most of the New Keynesian contributions tried to identify reasons for the lack of response of prices both up- and downward. In their models prices are sticky and quantities are flexible both up- and downward. The New Keynesian point of view is summed up by Ball et al. (1988: 12): after recognizing that "traditional Keynesian models often imply asymmetric effects of demand shifts" they argue that "asymmetric effects of shocks could arise from asymmetric price rigidity – prices that are sticky downward but not upward – but this is another appealing notion that is difficult to formalize."

However, we need a model where prices do not respond to excess supply, although they may well respond to excess demand; this was the original Keynesian assumption and it provides a better approximation as to what happens in the real world. We need a model that is apt to explain involuntary unemployment but allows for the existence of inflation and hyperinflation. It is true that Blinder et al. did not find asymmetric stickiness.<sup>9</sup> This might be true for environments of very low inflation, but it seems rather difficult to make sluggishness in upward price adjustment compatible with medium and high inflation. At best, to assume symmetric stickiness may be valid for only the particular case of very low inflation, but in this case the difference between flexibility and stickiness blurs.<sup>10</sup>

New-Keynesian economics was supposed to be the answer to the Lucas critique. But "New-Keynesian economics is the art of finding Keynesian results in a New-Classical framework" (Melmies, 2008: 4). The difficulty is that once you take New-Classical assumptions you get New-Classical conclusions.

This is what happened to the New-Keynesian program. It devoted a lot of effort to finding microeconomic foundations for wage and price rigidity. However, strictly speaking, unemployment due to rigid wages is the (classical) voluntary kind of unemployment. A reduction in real wages will reduce/eliminate the kind of unemployment found in New Keynesian models; it has nothing to do with Keynes' involuntary unemployment. Let us remember Keynes' definition of involuntary unemployment:

"Men are involuntarily unemployed if, in the event of a small rise in the price of wage-goods relatively to the money-wage, both the aggregate supply of labor willing to work for the current money-wage and the aggregate demand for it at that wage would be greater than the existing volume of employment" (Keynes, 2016: p. 14).

Therefore, in the Keynesian framework, involuntary unemployment persists even if real wages are reduced, which is contrary to the New-Keynesian conclusion. Unemployment in New Keynesian models is not at all Keynesian. Involuntary unemployment means, by definition, a non-optimizing behavior; that is why it is called "involuntary". New Keynesians tried to show that unemployment is compatible with optimizing behavior, while Keynes was talking about a non-optimizing behavior.

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<sup>9</sup> The interview method used by Blinder and his colleagues has two difficulties. First, answers can be influenced by the precise wording of the questions, and secondly, people may have no incentive to respond truthfully or thoughtfully.

<sup>10</sup> Using data from Australia and US, De Abreu Lourenco and Gruen (1995:16) find that "the inflationary impact of relative price shocks depends strongly on expected inflation. When expected inflation is high, a rise in the economy-wide dispersion of shocks is inflationary in the short-run. By contrast, when expected inflation is low, a rise in the dispersion of shocks has minimal impact on inflation."

The New Classical answer to the New Keynesian arguments was straightforward: remove rigidities and you will have no unemployment. In one way or the other, unemployment is voluntary. In Lucas's words, "there is also a voluntary element in all unemployment, in the sense that however miserable one's current work options, one can always choose to accept them" (Lucas, 1978: 354).

Unemployment is, in this context, voluntary by definition: it exists only because there is some constraint which avoids real wages to find their equilibrium levels. Of course, this means that, for example, you have to call unemployment rates of 25%, as Spain and Greece witnessed, "voluntary".

Then, if you do not feel comfortable calling a 25% rate of unemployment "voluntary", you had better get rid of the wage market clearing assumption. If you want to get involuntary unemployment, you cannot assume that the labor market clears. This is what Keynes did. As we have seen, in the Keynesian model the level of employment depends on the goods market, where the volatile, and thus determinant factor, is investment. Whenever there is a deficiency in investment – and hitherto in aggregate demand – there will be unemployment. There is no force in the economy that pushes the aggregate demand to its full-employment level. In Keynes' words

"The propensity to consume and the rate of new investment determine between them the volume of employment, and the volume of employment is uniquely related to a given level of real wages – *not the other way around*" (ibid: 27, emphasis mine).

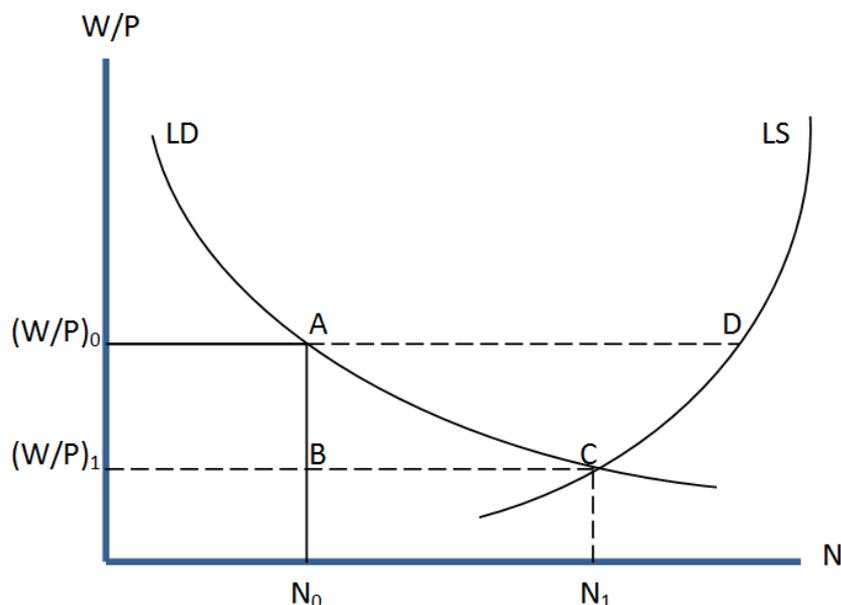
Thus, there is no self-adjusting mechanism in the labor market that ensures full employment. In the Keynesian model, it is not true that real wages and the level of employment are determined by the intersection of the labor demand with the labor supply. The level of employment ( $N_0$  in Figure 2) and the marginal productivity of labor  $Q_N$  define an equilibrium point *on* the labor demand schedule (*A*). Involuntary unemployment is measured by the distance *AD*. Workers earn a real wage  $(w/p)_0$  which equals the marginal productivity of labor, as shown in equation (4) above, but it does not necessarily equal the marginal disutility of labor.

The mainstream economics argument is that in such a situation wages would fall under the pressure of excess supply. In fact, in the labor market there will be excess supply – there is involuntary unemployment measured by *AD* – but even if real wages fall – for example, from  $(w/p)_0$  to  $(w/p)_1$  – the volume of employment will not increase; point *B* depicts this situation but it is not an equilibrium point because firms are prepared to pay higher real wages  $(w/p)_0$  for that level of employment.<sup>11</sup> *A* is an equilibrium point, but neither *B* nor *C* are. If there has been no change in the goods market, there is no reason why firms should hire  $N_1$  instead of  $N_0$ , whatever the real wage is. There are no economic forces at work to drive the labor market to *C*.

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<sup>11</sup> Unless the decline in the real wage is a consequence of a downward shift in the demand for labor curve, in which case *B* would be an equilibrium point and *BC* the involuntary unemployment at the new real wage level.

**Figure 2** The level of employment in the Keynesian model



## 7. The Post-Keynesian approach to price behavior

Post-Keynesians economists offer different microeconomic foundations to Keynesian macroeconomics. They argue that prices are sticky because firms prefer stable prices and that is why they do not react to changes in demand. Firms act in a world of fundamental uncertainty, and they want stable prices to cope with that sort of world. “In ‘Post-Keynesian markets,’ price rigidity comes from price stability which is desired by firms on decentralized markets” (Melmies, 2010: 14). Firms prefer price stability to maximizing profits. “Firms set prices they keep unchanged for a certain period. If costs increase during this period, profit margins will decrease” (ibid.). It is output rather than price which fluctuates over the cycle.

Prices reflect both production costs at the normal level of output and the demand for retained profits to finance the planned level of investment expenditure. The latter determines the size of the mark-up or margin on costs.

Although there are different versions of Post-Keynesian price theory the essential idea is that “firms fix prices based on some measure of costs, rather than as a reaction to demand fluctuations” (Lavoie, 2001: 21)

For our purposes – which have to do with how to model price behavior in macroeconomics – this argument shares the difficulty pointed out above: prices are sticky both up and down. But sticky prices never prevented inflation from happening in the real world. And Keynes never ignored inflation as a possibility. Therefore, the Post-Keynesian approach is, in this respect, subject to the same critique as the New Keynesian one, although it has been conceived as an alternative to it.

## 8. How do markets reach a non-price equilibrium?

Can markets reach their equilibrium without the intervention of a price mechanism, as we have suggested in Section 5?

Let us start with the aggregate demand and supply functions. The propensity to consume and the amount of investment determine between them the aggregate demand.

Let us start with investment. The amount that firms decide to invest in a given year determines the amount of capital goods that they demand and suppliers sell in that year. If the planned supply of capital goods exceeds that amount, this oversupply will remain unsold in the short run.

The consumption component of aggregate demand, as we have seen above, is a function of income. Given the amount of consumption goods demanded, any excess supply will remain unsold, as in the capital goods case.

In the long run, some firms will downsize and others will shut down; this process will go on until planned supply equals demand. In the long run the excess supply disappears. Of course, those firms that remain in the market are those that are profitable.<sup>12</sup>

So, in the short run there will be two sorts of markets: those where demand equals supply, as taught in the textbooks, and those where supply exceeds demand; in the latter case, price downward rigidity means there is no force that can remove the excess supply. It will disappear only in the long run.

Formally, calling  $\mathbf{z}$  the vector of excess demands, in the short run  $\mathbf{z} \leq 0$ , where  $z_i = 0$  for  $i = 1 \dots m$  and  $z_i < 0$  for  $i = m+1 \dots n$ . This is because  $dp/dt \geq 0$  for  $i = 1 \dots n$ . In the long run,  $\mathbf{z} = 0$  because quantities adjust until the excess supply is eliminated.

Some scholars may miss the aesthetics, beauty, and elegance of the Walrasian general equilibrium approach, where the symmetric adjustments of prices do all the magic. But are these aesthetics, beauty, and elegance enough to adopt an approach that has no empirical content?

Other economists may feel uncomfortable because they may interpret that, in Barro's words, we are leaving opportunities for mutually desirable trades or, as Lucas often repeated, we are leaving a \$500 note on the sidewalk. Well, this is the meaning of involuntary: the economy lacks the necessary investment to attain full-employment equilibrium. The more than 6 million unemployed in Spain in 2013 were leaving many \$500 bills on the sidewalks but a fence prevented those people from collecting them. The name of that fence was deficient demand.

## 9. Why prices do not eliminate the excess supply?

If planned output exceeds effective demand, why is it that prices do not go down until markets clear?

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<sup>12</sup> This is the general rule in the capitalist world. If costs systematically exceed income firms cannot survive in the long run, unless they are state-owned or state-backed.

First of all, let us recall the distinction introduced by Okun between auction and customer product markets. In auction product markets, prices clear competitive markets as the Walrasian general equilibrium model assumes. In customer product markets, firms set prices that do not necessarily equate demand and supply.

With a few exceptions (commodity and asset markets), in the XXI century real-world customer markets are absolutely predominant. Therefore, there is no reason to base the edifice of microeconomics on the assumption that markets behave as competitive auction markets when they are the exception rather than the rule. It was reasonable in the XIX century, but not now.

What microeconomic theory did Keynes have in mind when he wrote the *General Theory*? The *General Theory* is held to be compatible with both perfect and imperfect or monopolistic competition (Davidson, 1962; 2002). Indeed, in the *General Theory*, there is no explicit reference to the underlying assumption about the degree of competition. However, in a later paper, Keynes (1939: 46-50) admitted that perfect competition was not a realistic hypothesis and accepted imperfect competition as the benchmark to analyze what he called “the modern quasi competitive system” (ibid: 46).

Getting back to the question asked at the head of this Section, there are many arguments that explain the aforementioned behavior at the firm’s level once one leaves the golden realm of perfect competition and enters the intricate labyrinths of the real world. Let us list some of them.

1. If goods are heterogeneous and each supplier faces an inelastic demand function, there is little or no incentive to reduce prices.<sup>13</sup>
2. Firms do not change prices because they do not want to start price wars. “Do not do what can be easily mimicked by your competitor” is a practical rule in business. Facing a decrease in demand, an individual firm will not reduce its price if it expects other firms will follow suit.<sup>14</sup> Cutting prices is such an unusual practice that the entrance in the taxi market of a new competitor charging lower rates became front-page news in many countries.
3. As it was pointed out above, if we assume positive trend inflation, one can rely on it to reduce a relative price without any need of changing its nominal price.
4. Price reductions are a source of conflict with customers. “Why did I pay more for the same product yesterday?” is a question that firms find difficult to answer if the decrease is not associated with some special event like, for example, a clearance sale.
5. Firms fear that customers may associate a fall in price with a fall in quality.
6. Lowering prices may be interpreted as a signal of difficulties and a lack of confidence in the product. It may have a deleterious effect on the brand.

We have here six solid practical reasons why firms do not cut prices in the real world when they face a contraction in demand. They prefer to resort to other tools like improving advertising and marketing, reinforcing the sales task force, stretching the payment period, etc.

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<sup>13</sup> Moreover, if after a shift down the demand function becomes more inelastic it is profitable to increase the price.

<sup>14</sup> In his seminal article on oligopoly, Rothschilds (1947: 310) underlined that firms refrain from lowering prices to avoid retaliation from the competitors.

These are all arguments that explain why prices do not response to excess supply. They are specific to explaining downward price rigidity: they cannot be invoked to justify upward price stickiness, if it exists at all.

The result is, if there is a fall in aggregate demand, prices will not fall; there will be an excess supply in the short run.<sup>15</sup> In the long run, the aggregate supply will adjust to the level of aggregate demand. Prices play no role in this process.

Mainstream economists argue that assuming prices downward stickiness is ad hockery because it lacks microfoundations. If a firm does not adjust its price when relevant state variables change it will not be maximizing profits, they argue. This may be true in the frictionless world of theory.

However, none of the six reasons which justify price downward rigidity contradicts the profit maximization assumption. On the contrary, they explain firms' behavior in order to maximize profits in the long-run in the *real-world* under *real-world* constraints.

On the contrary, I don't find convincing reasons to assume perfect price flexibility except the elegance of symmetry. But elegance should not be confused for truth. If economic models are ever going to provide realistic guides to policy the real issue is what assumption is a better approach to what happens in the real world.

In empirical sciences, when there is a conflict between theory and empirical evidence, it is theory which is in trouble. For mainstream economics it is the opposite as if economics were a branch of applied mathematics and not an empirical science. That is why internal consistency, rather than external consistency – in the sense of conformability with empirical evidence – becomes the criteria for model admissibility (Wren-Lewis, 2009).

If there is someone who still remains unconvinced by the above arguments, remember Solow's AEA presidential address reflection:

“I remember reading once that it is still not understood how the giraffe manages to pump an adequate blood supply all the way up to its head; but it is hard to imagine that anyone would therefore conclude that giraffes do not have long necks. At least not anyone who had ever been to a zoo” (Solow 1980: 7).

However, a mainstream economist would argue that, for the sake of internal consistency, zoologists should better assume that giraffes have short necks.

Although it is, of course, always desirable to go on improving the arguments that explain price change asymmetry, it seems absolutely much more reasonable to assume asymmetric rather than symmetric behavior anyway, at least for anyone who studies the real-world economy.<sup>16</sup>

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<sup>15</sup> Even so, markets will be in equilibrium because, in the short run, excess supply does not generate any movement to eliminate it.

<sup>16</sup> In physics, Newton's theory of gravity tells us how bodies attract each other but it fails to identify the mechanism responsible of the motion of bodies.

Moreover, as recalled above, even Friedman agreed that price asymmetric behavior is a well-established fact in modern economies. However, it is likely he would add that assumptions in economics do not necessarily have to be based on real-world behavior.

## 10. The fundamental microeconomic assumption

For all the reasons given above, I propose the adoption of the following Fundamental Microeconomic Assumption (FMA): nominal prices display downward rigidity. Formally,  $dp_i/dt \geq 0$  for  $i=1 \dots n$ .

This should be the starting point for the microfoundations of Keynesian macroeconomic analysis.

From FMA two corollaries immediately follow:

**Corollary I.** Any change in relative prices entails an upward change in the general price level.<sup>17</sup> In fact, FMA means that any change in relative prices implies an upward change in at least one price of the economy while, by assumption, none falls.

Corollary I implies that, for every economy, there would be a *natural rate of inflation*. This is the rate of inflation necessary to allow for the changes in the relative prices of that given economy.

**Corollary II.** In the absence of an increase in the money supply equivalent to the natural rate of inflation, there will be a fall in output.

In fact, from  $MV = PT$ , it follows that if there is an autonomous increase in  $P$  and  $MV$  is constant,  $T$  should necessarily fall.

This means that if the money supply rises less than the natural rate of inflation – assuming that  $V$  is relatively constant in the short run – the economy will be condemned to stagflation. That is why the natural rate of inflation can also be called the NAURMI (non-accelerating unemployment rate of money increase) because it measures the minimum rate of growth in the money supply necessary to keep the level of output (and employment) constant.

Once the FMA is accepted, it follows that if there is an excess supply, the equilibrium will be reached by an adjustment in quantities, and not in prices, just as Keynes assumed.

To sum up, let us suppose there are  $n$  good markets; let us assume that in  $m$  markets there is excess demand. Then prices will increase until supply equals demand, as in the classical model. In the  $m-n$  markets where there is excess supply, as monetary prices are downward inflexible, the excess supply will remain unchanged in the short run. Prices remain in these markets at the historically attained levels. Strictly speaking, all markets will be in equilibrium as there is no economic force that can change the value of the economic variables in the short run. As stated above, in the long run some firms will lay off some part of the labor force and others will shut down until planned supply equals demand.

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<sup>17</sup> This is the essence of the non-monetary theory of inflation as explained, among others, by the recently deceased professor Julio Olivera. See Olivera (1960; 1964).

## 11. The wealth effect and price asymmetry

Keynes never thought the decline in prices could be a way out of involuntary unemployment. He did not consider the possibility of a real balance effect on the goods market, just as nobody did before Pigou (1943). The experience of inflation after World War II, which was attributed to the excess liquidity built up *during* the war, paved the way for the inclusion of the wealth effect as an argument in the consumption function.

For Keynes, the real balance effect was limited to the money market, the so-called Keynes effect. That is to say, an increase in real balances would have a reduction in the interest rate as its main effect.

Keynes was a practical-minded economist. He was very skeptical about downward nominal wage and price flexibility in the real world. That is why he insisted that real wages, in practice, can be lowered only by the increase in wage-good prices, not by the contraction of nominal wages.

Mainstream orthodox economics has used the wealth effect as the key instrument that leads the economy to full employment: excess supply in the goods market lowers prices and the consequent wealth effect reestablishes the level of aggregate demand at its full employment level.

However, if prices are downward rigid there is no wealth effect at all and there is no magic key to the full employment kingdom. Although the wealth effect may be useful in analyzing inflationary processes, it is of no practical relevance when dealing with recession and unemployment, the subject matter of Keynesian macroeconomics.

## 12. The Phillips curve

The *General Theory's* main concern was unemployment. Its aim was to show why an economy can be stuck in unemployment and how to get out of it. The appearance of chronic inflation as an economic problem in the 1970s triggered the anti-Keynesian revolution. It was argued that demand stimulus to raise employment would always be associated with higher inflation.

Popular folklore has it that Keynes was largely unconcerned with inflation. As a matter of fact, Keynes (2016: 271) admitted that wages and prices would rise gradually as employment increases: "(...) we have in fact a condition of prices rising gradually as employment increases" and "an increasing effective demand tends to raise money-wages though not fully in proportion to the rise in the price of wage-goods" (ibid.: 275).

This was the origin of the idea behind the Phillips curve: there is always a trade-off between alternative levels of unemployment and inflation: the lower the level of unemployment, the higher the level of inflation is. The Phillips curve provided a link between the level of employment and the general wage level.

The debate on the Phillips curve became a turning point in the development of macroeconomics.

Actually, Phillips investigated the relationship between unemployment and the rate of change of money wages along one century, from 1861 to 1957, in the United Kingdom. Phillips (1958) found an inverse relationship between the rate of changes in the money wage rate and the rate of unemployment. He argued that

“when the demand for labor is high and there are very few unemployed we should expect employers to bid wages rates up quite rapidly [...] On the other hand it appears that workers are reluctant to offer their services at less than the prevailing rates when the demand for labor is low and unemployment is high so that wage rates fall only very slowly.”

Therefore, the relationship between the two variables is not only inverse but also highly non-linear. These findings fit perfectly well within the original Keynesian model. It depicts the consequences of shifts in the demand for labor curve together with downward wage stickiness.

These results were hijacked by Solow and Samuelson, who substituted the rate of price inflation for the change of money wages. This substitution led to the policy conclusion that there exists an exploitable trade-off between inflation and unemployment. They presented this relationship as a policy menu to determine the costs of full employment. The Modified Phillips Curve version became highly popular during the 1960s. Decision-makers used it to estimate the costs of lowering unemployment in terms of the increase in the inflation rate.

However, in the 1970s, the modified Phillips curve was challenged from both the theoretical and the empirical points of view.

From the theoretical point of view, Friedman (1968) and Phelps (1967; 1968) pointed out that it was real, not money, wages which varied to clear the labor market. This thesis was sharpened with the help of the rational expectation hypothesis by Lucas. They proposed an expectations-augmented Phillips Curve and argued that, since all expectations are fully realized in the long run, a “natural rate of unemployment” will prevail. The long-run Phillips curve would be vertical at the natural rate of unemployment and no trade-off would exist. However, if an expansionist monetary policy is unanticipated, the general price increase that follows will be interpreted by each agent as an increase of relative prices. Consequently, monetary policy will have a real effect, by increasing output and employment. “Because prices are sticky, faster or slower monetary growth initially affects output and employment. But these effects wear off.”<sup>18</sup> This explains the existence of a short-run Phillips curve. The faster workers’ expectations of price inflation adapt to changes in the actual rate of inflation, the faster unemployment will return to the natural rate, while inflation will remain at the new higher level. The natural rate of unemployment is compatible with any rate of inflation: the long-run Phillips curve is vertical.

As stated above, the trick consists of introducing wages as the clearing mechanism in the labor market. Any unemployment above the “natural” unemployment will be eliminated by a fall in the real wage rate. Any remaining unemployment is natural unemployment.

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<sup>18</sup> Milton Friedman “Defining Monetarism” *Newsweek*, 12 July 1982, p. 64

The concept of the natural rate of unemployment was later replaced by the NAIRU (non-accelerating inflation rate of unemployment), which is understood as the level of unemployment at which inflation stabilizes. Strikingly, Phillips's article discusses an anticipation of the NAIRU concept, which would be coined 20 years later. He states that "if aggregate demand were kept at a value which would maintain a stable level of product prices the associated level of unemployment would be a little under 2½ per cent" (Phillips, 1958: 299).

NAIRU was considered the equilibrium rate of unemployment to which the system would return after any disturbance. "Only if the real wage desired by wage-setters is the same as that desired by price-setters will inflation be stable. *And the variable which brings about this consistency is the level of unemployment*" (Layard et al., 1991: 12, emphasis in original).

From the empirical point of view, the 1970s witnessed a simultaneous increase in both unemployment and inflation, which apparently contradicted the Modified Phillips Curve. I say "apparently" because the presence of a simultaneous rise in unemployment and inflation after the OPEC oil price hikes could have been interpreted as just an outward shift in the existing Phillips curve. For example, Lipsey (1960) has already argued that the Phillips curve shifted in the period between 1923–1939 and 1948–1957, in comparison to the pre-World War I period. With many more reasons the same could be argued with reference to the 1970s after OPEC substantially changed its oil price policy.

The main interest in the 1970s had shifted from unemployment to inflation. Hahn (1980: 285) noted that "even ten years ago one would have taken it for granted that a government should and could have a policy designed to reduce the average level of unemployment. Now this is no longer so."

The New Classical counterrevolution was, in Blinder's (1988: 278) words "a triumph of *a priori* theorizing over empiricism, of intellectual aesthetics over observation and, in some measure, of conservative ideology over liberalism. It was not, in a word, a Kuhnian scientific revolution."

After burying the Phillips Curve, Friedman (1956) revitalized the Quantity Theory, restating it in terms of a demand for money function, which now included an expected inflation term, which affects the expected nominal returns on the various classes of assets.

People demand a certain real quantity of money. If the quantity of money unexpectedly increases, people will seek to dispose of their excess money balances. Prices will increase until the real quantity of money held by people coincides with that which they want to hold.

This meant that in the long run all analyses could be conducted in real terms because the price level is proportionate with the stock of money.

### **13. Stagflation**

Economic theory and economic policy faced a quite new phenomenon in the 1970s: stagflation.

As stated above, the 1970s witnessed a simultaneous increase in both unemployment and inflation after the first OPEC oil shock in 1974. The simultaneous presence of those two

phenomena marked the end of the Phillips curve's popularity and, with it, of the Keynesian era.

The New Classical economists demolished the Keynesian model with the argument that it could not explain the phenomenon of stagflation. The paradox is they gave no explanation of it at all, unless one considers as such the following argument. There is always a natural rate of unemployment; it is compatible with any rate of inflation: a vertical Phillips curve in the long run implies a natural rate of unemployment consistent with any given rate of price-increase. Then, the problem with stagflation is the inflation component and not the stagnation one. Lucas rejected the short-term–long-term split of Friedman in the analysis of the Phillips curve. Agents are endowed with rational expectations and they efficiently use all the available information. The economic agent acts as if s(he) were an econometrician and estimates the model parameters. Authorities cannot “fool” economic agents, not even in the short run. Expectations play a critical role in New Classical economics. If people expect an expansionary monetary policy, they will adjust their behavior instantaneously and prices will go up even if the Central Bank does not expand the monetary supply.

The actual unemployment is the natural one. And it is absolutely voluntary: it is the result of the households' choice because they find the actual real wage rate too low to motivate them to supply their labor services. Policy makers should be concerned with inflation, not with unemployment. Unemployment stays at its natural rate and any increase in monetary creation, if it is anticipated, is inflationary.<sup>19</sup> Policy makers who expand the monetary supply to fight unemployment increase inflation without any long-run effect on unemployment. Expansionary policies just push inflation higher and unemployment rises because inflation decreases the real wage; workers prefer to work less because leisure is cheaper. That is why stagflation exists. This is a very ingenious explanation; the problem is that during a recession, *unemployment is the result of an increase in layoffs, not of a decision by workers to stay at home*. The New Classical school gave no valid explanation for the stagflation phenomenon.

The New Classical economists were interested in, and were successful at, changing the focus of economic analysis from unemployment to inflation.

#### **14. Keynes on monetary and fiscal policies**

In order to complete the picture of Keynesian economics, let us briefly look at Keynes' point of view on monetary and fiscal issues.

Keynes' monetary theory has as a starting point his theory of liquidity preference. This preference has an opportunity cost: the rate of interest. Thus, the quantity of liquidity *demand*ed is inversely related to the *interest rate*.

When the quantity of money is increased, its first impact is on the rate of interest, which tends to fall.

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<sup>19</sup> If it is unanticipated, it may increase output and employment but soon agents will realize there has been no change in the relative prices and unemployment will return to its natural level while inflation will remain at the new higher level attained.

However, Keynes warned that “whilst an increase in the quantity of money may be expected, *ceteris paribus*, to reduce the rate of interest, this will not happen if the liquidity preferences of the public are increasing more than the quantity of money” (Keynes, 2016 : 270).

Given the marginal efficiency of capital, a fall in the rate of interest will increase the volume of investment. The increased investment will raise effective demand through the multiplier effect, thereby increasing income, output, and employment. As we move from unemployment to full employment, prices gradually rise as employment increases. (Keynes, 2016: 271).

So, there are a number of “positions of semi-inflation” (Keynes, 2016: 275), “a succession of earlier semi-critical points at which an increasing effective demand tends to raise money-wages though not fully in proportion to the rise in the price of wage-goods” (ibid.).

The early transmission of money increasing into prices and the possibility of a “liquidity trap” (ibid.: 187) were reasons that explained Keynes’ skepticism on the monetary policy’s ability to deal with unemployment (ibid.: 242). He was much more confident on the effectiveness of fiscal policy to cope with it. He argued in favor of public construction, building houses, or even digging holes in the ground if narrow-minded statesmen couldn’t set in motion the former two alternatives. “I expect to see the State [...] taking an ever greater responsibility for directly organizing investment” (Keynes, 2016: 147).

Public expenditure was conceived as the best tool to fill the gap created by deficient demand.

After the 2008 financial crisis, Keynes’ prevention was confirmed.

The Great Recession revealed the limitations of monetary stimulus alone to overcome a severe recession. The Fed doubled the monetary base between September and December of 2008 but that money didn’t reach the people: it only increased bank reserves. The federal funds rate was cut from about 5% in mid-2007 to nearly 0% in late 2008, yet the economy continued to suffer from inadequate aggregate demand for goods and services. As Samuelson very graphically said:

“‘You can lead a horse to water, but you can’t make him drink.’ You can force money on the system in exchange for government bonds [...] but you can’t make the money circulate against new goods and new jobs [...] You can tempt businessmen with cheap rates of borrowing, but you can’t make them borrow and spend on new investment goods” (Samuelson, 1948: 354).

Calvo (2016: 33) calls this situation a “Supply-Side Liquidity Trap”: a point maybe reached where printing money increases real monetary balances but has little effect on real liquidity.

As Koo (2016: 24) rightly points out, when “private-sector borrowers sustain huge losses and are forced to rebuild savings or pay down debt to restore their financial health,” they have no choice but to pay down debt or increase savings regardless of the level of interest rates in order to restore their financial health. We are here in the presence of an economy in which everyone wants to save but no one wants to borrow, even at near-zero interest rates. Under these circumstances, “there is very little that monetary policy, the favorite of traditional economists, can do to prop up the real economy” (Koo, 2016: 34). It is the time for fiscal policy.

As Romer (2011: 3) recognizes, “we need instruments of discretionary fiscal stimulus as part of the macroeconomic toolkit” because monetary policy is not enough to stabilize an economy facing a large shock.

Meltzer has criticized Keynes’ recommendations in favor of using fiscal policy against unemployment. Meltzer (1988: 309) argues that short-term fiscal policy has not proven to be an effective tool of stabilization. He mentions that “attempts to lower unemployment by short-term policy adjustment have been followed by rising prices and capital outflow or currency depreciation.”

The recent experience, as Romer pointed out, vindicates the importance of fiscal policy. Moreover, he mentions a very conclusive example: the fact that the major increases in government purchases in the two world wars and the Korean War were associated with booms in economic activity.

It is true that Keynes modeled a closed economy. The challenge, then, is to extend Keynes’ model to an open economy to take into consideration a phenomenon like capital outflows mentioned by Meltzer. This implies including foreign trade as another component of aggregate demand as well as adding the possibility of acquiring foreign assets/liabilities.

For the open economy, the initial Keynesian workhorse model has been the Mundell–Fleming one. More recently, New Keynesian open-economy models with nominal price rigidities and intertemporally maximizing agents have been designed to understand the transmission of shocks across countries, exchange rate pass-through, and the effects of different pricing rules. New Keynesian models, particularly dynamic stochastic general equilibrium models (DSGE), became popular among central banks that use them in their job of setting an appropriate interest rate. Nominal price rigidity is introduced to ensure that shocks and central-bank interventions go beyond mere price effects. However, as they assume that wages and/or prices are upward and downward equally sticky, these models are only useful provided inflation is negligible. On the other hand, the recent financial crisis damaged the reputation of the New Keynesian DSGE models whose contribution has been of minimal value in addressing the greatest macroeconomic crisis in three-quarters of a century (Romer, 2011: 1/2)

Post Keynesians have extended their models to economies that are open to international trade and financial flows. Adding open economy features alters the potential outcomes of post-Keynesian models in several important ways. The analysis has focused on the effects of changes in the rate of exchange on output and trade balance. Blecker (2010) surveys the empirical results for several Post Keynesians models. Unfortunately, the results show that different studies using different methodologies have found different results for the same countries. This outcome is qualified as “disconcerting” by the survey’s author; however, this is a very common situation in economics. Beker (2005) has drawn attention to this fact: “given a certain econometric result, in many cases it is enough to just include another variable, or to slightly modify the model assumptions or the estimation method to get different, and even opposite, results.” There is nothing like a crucial experiment in economics. That is why models accumulate and remain available inside a big toolbox to be used according to the case under analysis and the analyst’s expertise.

New and Post Keynesians have developed some valuable instruments that may be useful for making further progress in the understanding of open economy macroeconomics from a true Keynesian perspective.

Openness imposes restrictions on monetary and fiscal policies. If prices increase, the substitution of foreign assets for domestic money is an alternative and currency depreciation may be a likely result, aggravating inflationary pressures.

This means that inflation should be carefully watched and should not be neglected as it was in some so-called Keynesian policy experiments Meltzer refers to. Unlike several so-called Keynesians, Keynes did not favor inflation: "The money wage level as a whole should be maintained as stable as possible [...] This policy will result in a fair degree of stability in the price level" (2016: 245). This puts a narrow limit on the use of monetary expansion as has been underscored by Keynes himself. The policymaker must watch unemployment with one eye and inflation with the other.

However, the recent European experience shows it is not so easy for inflation to gain momentum in a weak economy even when this is the central bank's target. And it also shows that, as has been pointed out above, it is equally difficult to refloat an economy only with monetary policy, even when resorting to negative interest rates.

Anyway, the monetary and fiscal areas in Keynesian macroeconomics demand an updating and deepening in order to take into account the role of the financial system in the present economy, explain current economic phenomena, and allow economists to formulate sensible economic policy recommendations.

In this respect, the 2007–2008 financial crisis is a superb natural experiment that provides very rich empirical material for the analysis.

## **15. Price stickiness: lessons from the European crisis**

We have proposed to adopt as FMA the statement that nominal prices display downward rigidity. However, the recent European experience shows that not only inflation remained far below the rate targeted by the ECB, but that it was even negative in some months. Does this not make our FMA as unrealistic as the flexibility neoclassical assumption?

The first observation is that the rate of core inflation has always remained positive, showing that deflation has had to do with the price of commodities – energy and unprocessed food – that is to say with goods whose prices are quoted in world auction-like markets. For the rest of the prices downward inflexibility has been the rule. Even in a country suffering from a very deep recession, like Greece, core inflation remained positive. Although Greece lost 25% of its GDP between 2007 and 2015, it accumulated an inflation of 11.26% over this same period. Compare this figure with a 2013 Goldman Sachs's study mentioned in Sinn (2013: 5)) in which they estimated that Greece's prices would have to come down by 25-35% to achieve external debt sustainability. The Greek case is a very clear example that, due to price and wage downward inflexibility, internal deflation is not a way out of the crisis. In spite of the huge loss in GDP, prices did not decline and even kept rising. Price asymmetric behavior means that the only way for Greece, or Italy, to get cut its relative price level is by means of an increase in the EU price level average.

This is just one example of how FMA is far closer to reality than the usual mainstream economics assumption of symmetric price behavior. It is time to adjust economic theory to reality instead of waiting for reality to adjust itself to economic theory.

## 16. Conclusions

After the crisis in economic theory triggered by the 2008 financial crisis, which exposed many of the fallacies of orthodox economic thinking, it is time to rebuild the theoretical edifice of economics.

Realisticness is a necessary condition economic theory must fulfill if we intend to make meaningful predictions for the real world and sensible political recommendations. In this respect, it is argued that price downward stickiness has to be a fundamental assumption of any model that tries to reach these goals.

It is argued that realisticness is precisely one of the features that distinguishes Keynes' analysis. For this reason, Keynesian macroeconomics must be the point of departure of a realistic reconstruction of economic theory. And price downward rigidity fits perfectly well the Keynesian model, while this does not happen with either the New Keynesian or the Post-Keynesian models.

Given price asymmetric behavior, it is necessary to conduct separate analyses; on one hand, full-employment macroeconomics (price equilibrium macroeconomics) and, on the other, the macroeconomics of recession and depression (Keynesian macroeconomics). In the first case, prices play a role, while in the second case they do not. We need a theory apt to explain involuntary unemployment as well as inflation. However, for this purpose, we need two different approaches to the economy's behavior because it is quite different when the economy faces a positive shock than when it faces a negative one.

I propose the adoption of the assertion that nominal prices display downward rigidity as the Fundamental Microeconomic Assumption (FMA). This should be the starting point for the microfoundations of Keynesian macroeconomic analysis. The *natural rate of inflation* is defined as the rate of inflation necessary to allow for the changes in the relative prices of a given economy. It can also be called NAURMI, as it measures the minimum rate of growth in the money supply necessary to keep the level of output (and employment) constant.

If prices are downward rigid, there is no positive wealth effect at all and there is no magic key to the full employment kingdom. Many of the predictions and recommendations by traditional mainstream economics are flawed because they are based on the assumption that monetary prices are downward flexible.

The New Classical economists demolished the Keynesian model with the argument that it could not explain the phenomenon of stagflation. The paradox is that while, from a Keynesian point of view, it could be explained as a shift outwards in the existing Phillips curve, the New Classical theory gave no explanation of that phenomenon at all.

On the other hand, stagflation appears every time the money supply grows less than the natural rate of inflation. Therefore, it is crucial for the monetary authorities to estimate that rate in order to avoid inducing stagflation by an excessively rigid monetary policy.

The recent European experience under the effects of the financial crisis show that price downward inflexibility has been the rule, even in countries like Greece which lost 25% of its GDP between 2007 and 2015, while inflation was 11.26% over the same period.

The discussion in this paper has argued that Keynesian macroeconomics (the study of unemployment, recession, and depression) should again be at the top of the agenda of economic research. What are the next steps? I single out here some leading examples of where I believe progress can be made.

As I mentioned above, Keynes' model has to be updated in order to take into consideration today's real world. This is a first area for future research.

Keynes modeled a closed economy. The first challenge is to extend Keynes' model to an open economy. Moreover, the globalization and financialization processes as well as the role that supranational institutions play in the contemporary economy have to be taken into consideration in order to update Keynes' ideas to the present-day reality.

New and Post Keynesians have developed valuable instruments that may be useful for making further progress in the understanding of open economy macroeconomics from a Keynesian perspective.

The financial sector now includes not only banks but also other intermediaries such as life insurance companies, investment funds, leasing companies and other finance companies like those which constitute the so called shadow banking system. All of them play a decisive role in the contemporary economy which cannot be ignored as the American and European crises prove. Among other things, this new institutional environment has a crucial role in conditioning saving and investment behavior which are key factors in macroeconomics.

Institutions like the IMF, ECB or the EU did not exist at the time Keynes wrote his General Theory. These institutional actors have to be taken into consideration at the time of analyzing economic policy alternatives and recommendations.

A second area for research concerns the empirical estimation of the national natural rate of inflation and what factors affect it.

A third area for research consists in analyzing what role monetary policy has played in different stagflation processes and what lessons have emerged from that analysis.

A fourth area for research concerns learning how the 2007–2008 Great Recession was prevented from turning into something like the 1930 Great Depression and, at the same time, the reasons why the recovery has been so slow and feeble.

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