

RESEARCH ARTICLE

An Inquiry into Modern Business Cycle Theory

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Abstract

This paper provides a synthetic insight into the main business cycle theories emerged during the twentieth century, following Keynes' General Theory, namely the New Classical and the New Keynesian theories. Essentially, economists today are addressing the same issues that they did several decades ago: How can we account for the different growth rates and various fluctuations observed in national economies? Which are the economic policies most suitable to solve these issues? The New Classics believe that business cycles can best be understood within the market-clearing model, whereby markets are perfectly competitive and prices adjust instantly. To explain fluctuations, these economists focus on monetary disturbances, technology shocks or the intertemporal substitution of leisure. Conversely, the New Keynesians believe business fluctuations reflect market failures of various sorts. The New Keynesians investigate the role of nominal and real imperfections and analyze the business cycle in terms of monopolistic competition, menu costs or efficiency wages.

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JEL classifications: E30, E31, E32

Introduction

In modern economies, current research generally acknowledges that the central issues in macroeconomics are essentially the same as those identified by Keynes in the *General Theory of Employment, Interest and Money*. One way or another, economists are trying to address the same macroeconomic issues that they did eight decades ago: How can we account for the different growth rates and various fluctuations observed in national economies? Which are the economic policies most suitable to solve the issues of growth and cyclic behavior? Despite the harsh debates and controversies, the greatest progress in economic science was that of macroeconomics, particularly in the field of business fluctuations and monetary neutrality.

Such an assertion may seem surprising, since the evolution of macroeconomics looks like a long series of revolutions and counter-revolutions: from the Keynesian revolution in the late '30s, to the Monetarist-Keynesian dispute in the '50s, moving on to the RATEX revolution in the '70s and finally, the New Classical – New Keynesian debates, as of the '80s.

This evolution gives the impression of a discipline that starts from scratch every 20 years, often under the pressure of events, and lacks a hard core shared unanimously by economists.

Following the collapse of Keynesian economics and the Phillips curve, the '70s represented a difficult period for its followers. Keynes had explained how shifts in aggregate demand caused economic activities to fluctuate, but at the beginning of the '70s, shifts in aggregate supply seemed at least as important. Today economists are much less sure about their answers, while the IS-LM model is considered outdated and is rarely found in economic writings. Following the collapse of the neoclassical synthesis, economic research was divided into two opposed directions. These schools, however, made considerable progress within their research paradigms: to explain economic fluctuations, the New Classical focus on monetary disturbances, technological perturbations and real business cycles; on the other hand, the New Keynesians speak in terms of monopolistic competition, menu

costs or efficiency wages. On the whole, the New Classical believe that the business cycle can best be understood within the market-clearing model, whereas the New Keynesians believe that business fluctuations are due to certain market failures of various sorts.

The first section of this paper focuses on the New Classical theories of the business cycle, starting from Lucas' monetary cycle to the more recent, real business cycle theories (RBC). The following section analyzes the way New Keynesian economists have incorporated nominal and/or real rigidities into business cycle research. Section four presents concluding remarks.

The New Classical Approach to Business Cycles

Basically, there are two main approaches to business cycles within the New Classical School: the monetary business cycle constructed by Robert E. Lucas, Jr. and the more recent, real business cycle (RBC) theories. The New Classical School, also known as the "rational expectations school" or the "market-clearing approach", emerged in the '70s, following Friedman and Phelps' predictions about the long-run Phillips curve: the two economists argued that sustained inflation can have no effect whatsoever on employment, since individuals are concerned with real, rather than nominal variables: once they anticipate sustained inflation, they will adjust their decisions on prices and employment levels accordingly. Still, this adjustment allowed for a temporarily low unemployment rate, over the short term, when the economy was stimulated, say, through expansionist monetary policy.

These observations set the ground for Lucas' monetary theory of the business cycle. Lucas' innovative theory (1972) investigates the way shifts in monetary policy influence inflation, production and unemployment, starting from a categorical empirical observation: during expansions, the growth rate of monetary aggregates is above average, whereas in recessions, the growth rate is below average. Lucas' contribution is twofold: at the theoretical level, he formulated and analyzed a specific mechanism in which monetary instability leads to fluctuations in output and inflation rates. Within this mechanism, individuals -who possess limited information -identify monetary perturbations as shifts in

relative prices, which lead to aggregate output fluctuations.

Lucas' model relies on the premise that individuals are more informed about the prices of the goods they produce than the price of the goods they purchase. Consequently, they tend to mistake movements in the general price level-which are irrelevant in the model-for movements in the relative prices-which are relevant for economic agents. In the case of unanticipated inflation, individuals infer that the relative prices of the goods they produce are temporarily high, and thus, decide to increase output.

Lucas constructs his model within a framework initially developed by Paul Samuelson [1], where we find two generations of people, young and old, and only one commodity which cannot be stored. In this stylized model, both current and future generations must find a way to transfer part of each period's output to the old generation. For the purpose of the analysis, Lucas is interested in another instrument that can perform the same function, namely money. In this situation, the old pay the money they possess in exchange for the goods they consume.

The young, on the other hand, are willing to sell part of their production, with a view to buying goods from the future generations when they are old. In choosing the amount of output supplied, they will have to anticipate the value of money at the time they are old. And the value of money, in turn, depends on the next generation's decisions and thus, on their anticipations. This means that making rational decisions by the present generation implies anticipating the anticipations of others.

In this economy, the notion of equilibrium implies that the anticipations or forecasts of future prices coincide with the actual prices prevailing over the next period; in other words, equilibrium implies such a price and such a quantity of goods supplied, that the amount of money supplied by the old equals the amount of money that the young wish to possess in the future. The main feature of this market-clearing model is that monetary units have no effect on real variables, in other words, money is neutral.

Other types of monetary injections may or may not be neutral. Suppose, for instance, that the central bank decides to expand the money supply at a constant growth rate and does so by continuously giving the old generation money in a lump sum, independently of the amount of money they possess. Such an injection will naturally have inflationary effects, leading to a constant price increase. Lucas however, is looking for a framework in which a monetary expansion initially creates an increase in economic activity – as the evidence points out – but to this aim, the above mechanism is not satisfactory.

In order to ground his model on the information mechanism, Lucas assumes that transfers are proportional and therefore, neutral at the real level; he constructs a model made up of two islands, each having the same number of old people. The number of young people is fixed, but they are distributed randomly between the two islands.

In addition, money supply is constant. On the island with few young people, prices will be high, since there are few producers, signaling that they should produce more; conversely, on the island with many young people, prices will be low, making them produce less. In this economy, production is above average on one island and below average on the other, so that total output on the two islands fluctuates over time in line with the distribution of the young over the islands; but these fluctuations have no connection to the business cycle: one of the main features of business cycles is that all economic sectors have similar evolutions.

If we add monetary perturbations, then an injection of money in the economy incurs a rise in prices. For a young person, this rise can have two explanations: (i) prices may be high due to monetary perturbations, in which case the optimal decision is to maintain current production levels or (ii) prices may be high due to the low number of producers, in which case the optimal decision is to increase production. If the producers do not know for sure, then the best decision is a trade-off between the two extremes, so that production rises on the whole. Therefore, in this economy, prices exceed their average level precisely when production is above average,

and when the money supply growth rate is above average. If the extent of the monetary perturbation is known, there is no confusion about the origin of the price increase and monetary perturbations are neutral. Thus, the model distinguishes between anticipated monetary fluctuations – which are neutral – and unanticipated monetary fluctuations – which influence real variables, and this is precisely the reason why the information mechanism plays the central role.

Lucas' model also has an important consequence at the policy level, a consequence initially formulated by, which finds confirmation in Lucas: starting from the implications of the model, the author argues that the best monetary policy rule is to set an annual constant growth rate for money supply; this will be accompanied by fiscal and public expenditure rules, but they are necessarily minimal rules. In a way, the best economic policy is the absence of monetary policy.

To conclude, the first New Classical models tried to construct a monetary business cycle and to this goal, they somewhat departed from the Walrasian paradigm, by assuming imperfect information regarding prices. Although this type of models generated a lot of interest in the '70s, it has attracted very few supporters recently. Its opponents claim that the confusions about the price level cannot be so important as to generate the large shifts in output and employment observed over the business cycle [2]. Moreover, empirical evidence generally invalidated the monetary models, but there is no firm proof to assert the reasons for its decline.

Once monetary models were abandoned, in the '80's New Classical economists shifted their focus on real perturbations in the economy. These real business cycle theories [3,4] postulate that fluctuations in real economic activity are based on shocks in technology, assuming that technological change is subject to large and random fluctuations. And since technology fluctuations lead to fluctuations in relative prices, individuals rationally adjust their labor supply and consumption levels. Thus, the business cycle is merely the natural efficient response of the economy to the shifts in the existing production technology.

Real business cycles are focused on technological shocks or other types of supply-side perturbations as central determinants of cyclical behavior and assign an important role to the dynamic elements that influence the pattern of shock propagation. As in all New Classical models, these models incorporate competitive markets and agents driven by optimizing behaviour. And even though these theories ignore monetary shocks, the analysis of the propagation patterns of business cycle phases can be successfully applied to both RBC models and to the initial monetary models. The difference is that in real models, any positive correlation between output and money supply reflect endogenous responses of monetary aggregates.

The empirical observations of real perturbations are generally consistent with the observed patterns of business cycles [5]. For instance, RBC theories are able to estimate accurately the relative variations of consumption, investment, capital stocks and labor in the economy, and at the same time account for the pro-cyclical behavior of these variables. However, they tend to exaggerate the pro-cyclical evolution of productivity, real interest rates and real wages.

The initial versions of RBC theories reflect the Pareto optimum and demonstrate that economic fluctuations are not a feasible reason for state intervention through stabilization policies. Negative shocks and recessions are merely unfortunate or unfavorable events and public authorities cannot do anything to correct the situation.

One of the strengths of this type of theories is its firm grounding on microeconomic principles. Real business cycle models are usually standard inter temporal models of general equilibrium, traditionally used in the analysis of economic growth and adapted only slightly to incorporate random changes in technology.

In opposition to both the Keynesian models and the initial new classical models, real business cycle theories subscribe to the classical dichotomy; first of all, they postulate the absolute irrelevance of monetary policy, thus rejecting a principle almost unanimously accepted at the end of the '70s; in addition, real business cycle theories do ‘

not assign nominal variables any role in explaining real variables fluctuations, thus pushing the Walrasian model further than any previous models. According to the real business cycle theory, the only forces triggering fluctuations are those affecting Walrasian equilibrium-namely the set of relative prices and quantities that equilibrate demand and supply on all markets simultaneously. Consequently, in order to understand the business cycle mechanism, we must analyze the fundamental factors influencing demand and supply for different categories of goods and services. In real business cycle models, fluctuations can be generated by numerous types of macroeconomic disturbances, but the technological type is the most common.

One of the obvious empirical observations that real cycle theory had to account for is that during the economic cycle, consumption and leisure move in opposite directions: when recession starts, consumption decreases and leisure increases-and the other way round during the expansion. For real business cycle theorists, consumption and leisure should-at least in principle-move in the same direction, since both are normal goods. The New Classical' explanation was that the price of leisure relative to goods – namely the real wage – decreases during recessions. Thus, an essential implication of real business cycle theories is the pro-cyclical evolution of real wages.

If the production function remained unchanged and at the origin of fluctuations laid demand shocks, then generating the implication of a pro-cyclical wage would pose serious problems. Since employment is low during recessions, we would expect the marginal product of labour and the real wage – to be high; in the situation of a constant production function, decreasing marginal returns of labor would generate a counter-cyclical real wage – as is necessary to explain fluctuations in consumption and leisure.

Under these circumstances, the New Classical start from the premise that in the rate of technological change there exist substantial fluctuations; during the recession, the available production technology is relatively UN favorable and the marginal product of labour and,

implicitly, the real wage, are low. In response, individuals choose to reduce consumption and increase leisure. An interesting conclusion of this type of models is that since economic fluctuations represent a disruption in Walrasian equilibrium- these fluctuations are actually characterized by efficiency. In equilibrium, when technological possibilities and preferences are given, the levels of employment, output and consumption cannot be improved.

The „optimality” of fluctuations is probably the most astonishing implication of RBC models: there is no doubt that during a recession, the level of welfare decreases compared to the preceding expansion. Keynesian theories explain the reduction in welfare as a coordination failure: since wages and prices do not adjust instantly to equilibrate supply and demand, some mutually advantageous exchanges do not take place during recessions. By contrast, the real business cycle theories reject this hypothesis, by motivating the decline in welfare through a decline in the technological capacities of the society.

Real cycle's supporters rely on the premise that employment fluctuations are entirely voluntary, in other words, that the economy is at all times positioned on the labour supply curve. However, throughout the business cycle, employment varies substantially, whereas labour supply determinants- the real wage and the real interest rate- fluctuate only to a small extent.

To comply with this observation, real business cycle models bring forward the premise that individuals will substantially reduce the labour supply in response to small and temporary reductions in the labour determinants. This hypothesis however, is not feasible, since empirical evidence documents a low inclination of individuals to substitute leisure in time. Studies on individual labour supply show that anticipated shifts in the real wage only lead to small shifts in the amount of labour supplied: individuals do not react to anticipated shifts in real wages through a substantial reallocation of leisure in time [6, 7].

RBC theories contrast strongly with the consensual vision of the '60s on several

controversial issues. First of all, the theory relies on the premise that the economy experiences sudden and large shifts in the existing production technologies. The RBC theory opponents [8, 9] argue that the assumption of large shifts in technology, particularly technological regress, is not plausible. Secondly, real business cycle theories assume that employment fluctuations reflect shifts in the amount of labour individuals are willing to supply.

Since employment varies considerably, while labour determinants vary only slightly, these models require that leisure be highly substitutable in time. This hypothesis is inconsistent with numerous econometric studies of labour supply, which evidence a low elasticity of inter temporal substitution during recessions; moreover, it is also inconsistent with economists' belief that high unemployment during recessions is, to a large extent, involuntary. Thirdly, real business cycle theory assumes that monetary policy is irrelevant in alleviating economic fluctuations. Previous to its formulation in the early '80s, most economists agreed on the non-neutrality of money; and even though the ability of systematic monetary policy was a controversial issue, it was at the same time generally acknowledged that an inadequate monetary policy can destabilize the economy.

The opponents of the theory also question the possibility that aggregate real shocks have such a large amplitude and frequency to trigger economic fluctuations, since experience is limited to the oil shocks and harvest failures. Subsequent empirical research, however, demonstrated that large shifts in preferences and technology can lead to persistent significant effects on aggregate output and employment [10]. On the whole, this research points out that RBC theories are promising in explaining sudden fluctuations in real economic activity and the tendency of rising unemployment starting with the '70s.

Another important objection to real business cycle theories is that they do not address the link between monetary and real variables appropriately [11]. According to Barro, during the '30s, the main empirical association between monetary aggregates and real variables derived not from the

shifts in the monetary base, but rather from fluctuations in the volume of financial intermediation, namely the size of credits and deposits. Under these circumstances, money appears more of an indicator of shifts in the business climate rather than an exogenous factor with major influence on real variables. However, statistical data on the interaction between the monetary base and real variables suggest a certain degree of monetary non-neutrality, but this type of connection between real and monetary variables is consistent with rational expectations models with incomplete information on prices and money, and does not rule them out.

In approaching the business cycle mechanism, real models usually take into account technological changes at the macroeconomic scale, as if these occurred in a single sector. There are however, theories focusing on the technological shifts occurring in different sectors [3]. All these models rely on an essential premise: even though shocks on different sectors are independent, the outputs of these sectors move together throughout the cycle. For instance, a negative shock on a sector will reduce the level of welfare for all individuals, which incurs a demand decrease for all the goods in the economy. Multi-sector models experience the same weaknesses as one-sector models: lack of any direct empirical evidence attesting the existence of large technological shifts, as well as lack of feasibility of the strong substitutability of leisure in time.

One such multi-sector approach of the business cycle is the sectoral shifts theory, which focuses on the cost of labour adjustment across different sectors of the economy [10, 12]. Similarly to the real business cycle theories, the sectoral shifts theory observes the classical dichotomy, by ignoring the role of monetary perturbations; but unlike real business cycle theory, it departs to a certain extent from the Walrasian paradigm, by assuming that when workers move from one sector to another, a certain period of unemployment is inherent, while they are searching for new jobs. According to this theory, recessions are periods in which sectoral shocks are more numerous than usual, and as a consequence, a larger sectoral adjustment is required.

This type of models seems more plausible than those based on substantial shocks of aggregate productivity and on intertemporal substitution. In this respect, the assumption that recessions require an intersectoral reallocation drastically seems more realistic than that of recessions being the result of a major technological regress, which renders leisure completely unattractive.

Numerous empirical studies have been carried out to confirm the validity of this theory, but the available data do not seem to support it. To the extent that during recessions we are confronted with voluntary unemployment caused by the transfer of labour to other sectors, we would expect to see high unemployment in some sectors of the economy and excess labour demand in other sectors.

But in real economies, fluctuations occur in a completely different manner: the rise in unemployment in some sectors is not accompanied by vacant jobs in others [13]. Moreover, even though the sectoral shifts theory asserts that workers move between sectors during recessions, empirical studies point out that their movement is pro-cyclical [14]. The supporters of the theory argue that this kind of empirical evidence is not convincing. Since the sectoral adjustment process implies a period of high unemployment and low income, there may occur a demand decrease in all sectors of the economy.

Thus, it is possible to notice high unemployment in some sectors and at the same time, few available jobs in others, despite the fact that initially, the recession was caused by the necessity of labour reallocation between sectors. To the extent that we admit the validity of this argument, it becomes unclear how we can distinguish empirically the real business cycle theories – which focus on technological fluctuations at the macroeconomic level – from Keynesian theories – which bring forward fluctuations in aggregate demand.

On the whole, we can conclude that the RBC real business cycle theories have generated a new perspective and novel techniques for modeling the macroeconomic area and constructing economic policy. However, it is not yet very clear to what extent these

theories contribute to an effective understanding of the business cycle mechanism or to the formulation of economic policy.

New Keynesian Theories

During the past 3 decades, New Keynesian economists have investigated whether the imperfect adjustment of prices could be logically inferred from realistic assumptions at the microeconomic level; these analyses led to a variety of non-Walrasian theories regarding the functioning of markets, which suggested that wages could perform other functions than to equilibrate labour supply and demand. Such models however, have the ability to account for unemployment, but they are not able to explain the failure of the classical dichotomy.

Any micro foundation for the failure of the classical dichotomy involves the presence of a nominal imperfection or rigidity; otherwise, any perturbation of purely nominal nature will leave the equilibrium unchanged. This observation immediately raises some difficulties, since individuals are ultimately concerned with real prices and variables. To the extent that nominal rigidities play an important role in determining cyclical behavior, it means that these rigidities – which are small at firm or household level – are capable of triggering a large effect at the macroeconomic level. This is the very assumption that contributed to the recent theoretical progress [15, 16] in understanding the microeconomic foundation of the real effects of aggregate demand perturbations.

The possibility that small barriers to adjustment might determine a considerable effect of nominal variations on aggregate economic activity depends on firms' inclination to change prices when the aggregate supply varies. Let us consider, for instance, the case where there is a decrease in output at the macroeconomic level. When the demand for a firm's products decreases – as a result of the decrease in output – the firm may either maintain prices unchanged and reduce production, or it may reduce prices and maintain production unchanged.

In essence, firms' inclination to reduce prices will be very low, if the potential gains incurred by the price reduction are very small, even if the shift in demand is large.

In this situation, the reaction of a large number of firms facing such difficulties in adjusting prices can determine very large real effects. If the representative firm is not inclined to change the price and there are price adjustment obstacles, aggregate output will decrease. If, on the other hand, the motivation to reduce prices is strong, all firms will reduce nominal prices, which mean that the negative demand shock will only result in the price decrease.

Firms' motivation to reduce prices in response to lower demand is determined by the way the marginal cost and marginal revenue react. The more marginal cost falls, the bigger the firm's motivation to reduce the price. Since the new output level is lower, then the amount of labour and the real wage will be lower as well, so the marginal cost will decrease. In what regards marginal revenue, the more it falls, the lower the firm's motivation to reduce the price. The main factor influencing the shift in marginal revenue is demand elasticity: if this variable decreases together with output, then the shift in marginal revenue will be larger and if the elasticity increases, the shift will be smaller.

In this way, the classical dichotomy failure occurs either because the marginal cost does not decrease enough after an output contraction induced by aggregate demand, or because the marginal revenue decreases too much, or perhaps, a combination of the two [17]. More generally, firms' inclination to change prices can be imagined as a function depending on two factors: the impact of the change on the real price which ensures profit maximization and the cost incurred by the deviation of the real price from its profit-maximizing level. In order for the inclination to adjustment to be low, one of two conditions must be fulfilled: (i) the profit-maximizing real price must respond little to aggregate output changes or (ii) considerable deviations from the profit-maximizing real price must only have small costs. In other words, a complete model with large real effects of nominal perturbations implies both nominal barriers and real rigidities.

Theoretical contributions have not yet clarified the most important real rigidities, but have brought forward several directions of research. The first focuses on the external

economies of scale induced by large market externalities. These models investigate the hypothesis and mechanisms whereby, in periods of intense economic activity, the acquisition of inputs and sale of final outputs is done more easily than in periods of low activity. The second direction of research analyzes capital market imperfections deriving from the existence of imperfect information. These models assume that asymmetric information between solicitants and providers of funds only represent a barrier to external funding, which makes internal financing less costly than external financing. Since firms obtain higher profits- and thus, more funds for internal financing-during booms, it means that capital market imperfections tend to impart a countercyclical evolution on the cost of capital. The third approach focuses on the cyclical behaviour of demand elasticity on the goods market, suggesting various causes of the shifts in elasticity in response to shifts in aggregate output.

None of the above directions however, focus on real rigidities on the labour market and still, real rigidities on this market play an essential part in explaining real effects of nominal perturbations. As already shown, if the labour market were Walrasian in nature and labour supply were inelastic, then real wages would have a strong pro-cyclical evolution, and the rigidities on the other markets should be extremely powerful to counter-balance the tendency of prices to adjust. Still, even though analysts debate the precise evolution of the real wage throughout the business cycle, there is no definite empirical evidence to point out a strong pro-cyclical behavior. This is precisely the reason why a fourth direction of research is trying to explain this matter.

Generally speaking, the real wage may not have a pro-cyclical evolution for two reasons: first, over the short term, labour supply may be relatively inelastic – a fact not confirmed by empirical evidence; and secondly, due to certain labour market imperfections, workers may not fit on the labour supply curve for at least one part of the business cycle. These models reject the connection between labour supply elasticity and the real wage response to demand shifts, which implies that the real wage may not have a pro-cyclical evolution, even if labour supply is inelastic. Other labour market

imperfections – such as imperfect information or bilateral monopoly induced by the heterogeneity of workers and jobs – could have similar implications for the movement of the real wage. To the extent that such imperfections make the real wage respond modestly to demand shifts, then they substantially reduce firms' inclination to adjust prices when perturbations occur. Moreover, the possible existence of substantial real rigidities on the labour market points to the rigidity of nominal wages rather than of nominal prices.

If wages show substantial real rigidity, a demand-driven expansion will only result in a small rise in optimal real wages. As a result, just as small barriers to nominal price adjustment can lead to substantial price rigidity, similarly, small barriers to nominal wage adjustment may lead to substantial wage rigidity

We shall next concentrate on the small nominal barriers to price adjustment, because they play the central part in models focused on price rigidities. One important approach is the so-called *menu costs* approach-these are the technological costs of changing prices (similarly to a restaurant faced with the cost of printing new menus).But these menu costs cannot account for several empirical observations regarding firms' pricing policies, observations which deny that price adjustment barriers reside in the costs of printing and displaying new prices. Moreover, the extent of the price change can vary a lot and the probability for price changes to be followed by a subsequent additional change is the same, whether the change in question is large or small. Finally, the frequency of price changes is low: on average, nominal prices are only modified after inflation erodes the real price by 10%. Under these circumstances, only a very large cost of price adjustment could reconcile these empirical findings with the menu cost approach. Similar observations can be found in Carlton [18] and Cecchetti [19].

Akerlof and Yellen, on the other hand, use the concept of near rationality to describe barriers to nominal adjustments, meaning that firms are willing to give up small profits; however, in practice, a lot of price policies rely on small profit losses. Their model however, does not clarify why firms

choose those policies that involve considerable nominal rigidities. Still, Akerl of and Yellen's model is not without importance: it suggests that obstacles to price adjustment are not necessarily technical in nature.

The most interesting approach to nominal price rigidities is based on an observation by Bennett McCallum [20]: since goods are exchanged for money, and no other goods, it is easier to express prices and wages in monetary units. In other words, is easier to use the exchange intermediary as a measurement unit, thus expressing prices in nominal- and not real-terms. In this context, the so-called menu costs hypothesis may indeed be responsible for the failure of prices to adjust continuously. Even if we accept this justification, it is rather unlikely – but not impossible – that these menu costs and the difficulties involved in the recalculation of prices should generate substantial nominal rigidity.

In the situation where prices are normally kept constant, then adjusting a price in response to shifts in aggregate demand—either through direct price changes, or by adopting an indexation mechanism—involves a conscious decision by the price setter. In this case, barriers to perfect price flexibility not only include computing difficulties and adjustment costs, but also the need to realize the benefits of price adjustment. Moreover, if most firms only rarely adjust their prices, then the cost of adopting a different pricing policy will not only comprise direct costs, but also the cost of explaining customers what that policy is and how it operates. The final outcome will most likely be that certain costs will affect the nominal price changes considerably.

This analysis suggests that the inflation rate represents an important determinant of the intensity of adjustment barriers. If inflation is high, then nominal prices are frequently adjusted, political decision-makers become aware that they have to make adjustments in line with the general price level and individuals no longer pay attention to nominal prices and wages. In other words, the real effects of a nominal shock are lower in high-inflation environments, and this implication differs from alternative theories. In traditional Keynesian theories for instance, the degree

of nominal rigidity is an exogenous factor. In Lucas's imperfect information theory (1973), the degree of nominal rigidity does not depend on the inflation level, but is determined by the difference or the discrepancy between aggregate demand shocks on the one hand and one particular firm's demand shocks.

Opponents of the nominal rigidities assumption objected that the adjustment costs were trivial, insignificant at the macroeconomic level and therefore could not be accepted as a foundation for the New Keynesian models. In response, the New Keynesians replied that there were obvious sources of wage and price rigidities: implicit labour contracts, efficiency wages, and insider-outsider relationships. The problem is that these are real rigidities, whereas the Keynesian theory is founded on nominal rigidities. Real rigidities by themselves do not represent a hindrance to nominal price flexibility, because the adjustment of nominal prices in response to a nominal shock does not necessarily imply any change in real prices.

Consequently, recent research focuses on the premise that reducing nominal rigidities is costless and tries to clarify how come substantial rigidity still turns up at the macroeconomic level. Significant contributions include Mankiw, Akerl of and Yellen, Blanchard and Kiyotaki, Ball and Romer. Based on economic analyses in imperfect competition, Mankiw, Akerl of and Yellen point out a simple phenomenon which opens new paths for future research: the cost of nominal rigidities for economic agents is much lower than the macroeconomic effect; But in the absence of motivations for price adjustment, agents refuse to cover these costs.

A further interpretation is provided by Blanchard and Kiyotaki [21]: the macroeconomic effects of nominal rigidity differ from the individual costs faced by economic agents, because the rigidity derives from an aggregate demand externality. A firm during a recession triggered by money supply contraction is confronted with a fall in demand and also with a fall in profits. The firm would like the demand curve to shift back to the right and to make the same revenue, but this is not possible through a price reduction.

Adjusting the price is merely the second best, or the minimal loss in revenue: the „gain” of the adjustment is actually the optimal distribution of losses between diminished sales and diminished prices. At this point, the recession would end if all the firms adjusted their prices. But no firm believes it can single-handedly end the recession and consequently, it may not make the adjustment, even if its costs are much lower than the recession costs.

New Keynesians also claim that aggregate demand shocks because large fluctuations in output and welfare, which are inefficient and require the stabilization of aggregate demand. Even though most models do not analyze the effect of demand fluctuations on wealth, Ball and Romer [12] show that small obstacles to nominal adjustment are enough to cause a large reduction in wealth and that aggregate demand fluctuations can be much more costly than relative price fluctuations.

None of these models are complete, however, because they cannot account for the dimension and persistence of non-neutralities: in real economies, nominal rigidities are amplified by other phenomena. On the other hand, real rigidities in themselves do not represent a barrier to perfect nominal flexibility. So it is the joint effect of nominal and real rigidities that explains the business cycle mechanism feasibly. Such phenomena include real wage and real price rigidities, as well as lack of temporal synchronization of price changes by firms. Thus, Ball and Romer have improved previous New Keynesian models, which were unrealistic and inconsistent with empirical evidence: substantial nominal rigidities can arise from the combination of a real rigidity on the labour market and the imperfect competition hypothesis or the menu costs hypothesis.

The importance of real rigidities is not yet clear in what regards their sources, dimension or precise effects. In addition, even the cumulated effect of nominal barriers and real rigidities is not entirely capable of explaining the dimension and persistence of nominal shocks effects on real variables. In all models, these effects are eliminated when prices adjust, but this does not happen in real economies. One possible explanation is the assumption of unsynchronized price adjustment by firms,

which results in a longer adjustment period for the general price level and implies that nominal shocks can have large and long effects, even though individual prices are changed frequently.

Another plausible explanation that consolidates New Keynesian models- though little explored so far-is that of asymmetrical effects of demand shocks, since the models discussed so far involve symmetrical responses of the economy to rises and falls in aggregate demand. For instance, in asymmetrical effects models, a demand decrease leads to a large output decrease, whereas a demand increase usually leads to price increases. Such asymmetries are very promising, as they support the Keynesian belief in the opportunity for demand stabilization. However, it is not yet clear if Keynesian models can be adapted to generate such asymmetries, and if they can, whether they can be formalized within the framework of current research.

Apart from these models, recent research has incorporated two new assumptions into existing models: imperfect competition and a focus on price – rather than wage – rigidities. In what regards imperfect competition, it is largely acknowledged that rigid prices are practically incompatible with perfect competition, because economic agents are not price setters; therefore, it is only on imperfect markets, when firms are price setters, that we can analyze the issue of adjustment.

Keynesian models in the '70s however, incorporated nominal rigidities into Walrasian economies, which often generated deformed results and required additional hypotheses. Introducing the imperfect competition hypothesis solves a lot of theoretical problems of the existing models through a series of advantages: the level of output is always demand-determined; expansions lead to an increase in welfare; wage rigidities cause unemployment through a low aggregate demand; nominal rigidities have externalities on aggregate demand; and imperfect competition clarifies the evolution of the real wage throughout the business cycle

Finally, the second theoretical innovation refers to the shift of the research focus on the goods market. Keynes and his followers

focused on labour market rigidities, primarily nominal wage rigidities. Current research integrates labour market and goods market rigidities, with an emphasis on the latter and analyzes the combined effects of both nominal and real rigidities.

This innovation has at least two advantages: (i) even though substantial nominal wage rigidities are present in modern economies, their real effects are not clear; research in the field of implicit contracts shows that maintaining employment independent from wages could be beneficial: firms prefer to choose the level of employment they deem efficient, rather than move on the labour demand curve when real wages change, whereas buyers on the goods market operate along the demand curve, and (ii) the focus on the goods market re-confirms the observation that real wages do not have a counter-cyclical evolution throughout the business cycle.

As already shown, this failure of traditional Keynesian models can be solved even if nominal rigidities are only present on the goods market. But it is much easier to provide a theoretical explanation for the evolution of real wages, when wage rigidity is combined with price rigidity: in this case, the effect of a shock on real wages depends on the relative size of the adjustments-both of prices, and of salaries.

Finally, apart from these models, another type of models has emerged recently, founded on the phenomenon of hysteresis-which implies permanent effects of shocks. Such a model is that proposed by Blanchard and Summers [22], which postulates that the natural rate of unemployment in European countries changes when the real unemployment rate changes, so there is no unique level where the latter tends to return to.

If these theories are correct, then the nominal rigidities cannot provide a comprehensive explanation of unemployment, because nominal prices adjust to shocks eventually. Under these circumstances, additional explanations are required, such as the insider-outsider model constructed by the two authors. Still, it is nominal rigidities that maintain the crucial role in explaining initial impulses of unemployment.

At the end of this presentation we must discuss the importance and feasibility of recent theories. The real effects of nominal disturbances depend on a series of barriers-or imperfections-of nominal nature. The only alternative to this approach is the assumption of imperfect information regarding the general price level.

And if we reject short-term monetary neutrality, we cannot possibly explain the relationship between real and nominal variables without resorting to nominal rigidities in the economy. Nominal rigidities are also important to explain the effects of real shocks on aggregate demand, triggered for instance, by shifts in public spending or in investors' expectations. There are other possible explanations for the effects of real shocks on demand-for instance Barro's model of public spending (1987); but the nominal rigidities assumption is still the most feasible explanation, considering that such explanations assume a large elasticity of labour supply.

Conclusion

Ever since Keynes' General Theory, economists have been striving to come up with a comprehensive macroeconomic theory to account for business fluctuations and enable the formulation of suitable economic policies. This fervent search has led to the proliferation of a vast number of theories, generally divided in two categories: one which analyses the economy in terms of equilibrium, under the market-clearing model and the other, which attributes business fluctuations to nominal and/or real imperfections in the economy. And despite the harsh debates between the two sides, macroeconomics has made great progress and consolidated several essential premises, which include monetary non-neutrality, rational expectations and the microeconomic foundations of macroeconomic analysis. On the other hand, the essential research area where debates and controversies will certainly continue is business cycle theory, and this is becoming the more pressing, the deeper economies plunge into recession.

Some might argue that the recent progress in business cycle theory will be of little importance at the practical level in the near future, but they forget this progress will eventually lead us to a better understanding of macroeconomic problems. As time goes by,

recent innovative theories, such as real business cycles, efficiency wages or menu costs may gradually lose their novelty. But some of these progresses are also likely to fundamentally change the way researchers analyze economic behavior and economic

policies. The next 20 years will probably show us which of these evolutions will have survived academic debates and practical testing and will have influenced our perception of the economy [23-46].

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