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Waldo Mendoza Bellido

DEPARTAMENTO DE **ECONOMÍA**

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Av. Universitaria 1801, Lima 32 – Perú.
Teléfono: (51-1) 626-2000 anexos 4950 - 4951
Fax: (51-1) 626-2874
econo@pucp.edu.pe
www.pucp.edu.pe/departamento/economia/

Encargado de la Serie: Luis García Núñez
Departamento de Economía – Pontificia Universidad Católica del Perú,
lgarcia@pucp.edu.pe

Waldo Mendoza Bellido

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RESUMEN

Este artículo tiene como propósito describir, en términos cronológicos, la evolución de la Teoría Macroeconómica, desde la publicación en 1936 de la Teoría General de J. M. Keynes en 1936, hasta los desarrollos macroeconómicos más recientes, motivados en la crisis económica internacional de 2008-2009.

Se describen, en primer lugar, los desarrollos alcanzados en el campo de las economías cerradas, destacando los aportes de Keynes y los desarrollos de los keynesianos y los monetaristas, y los consensos alcanzados entre estas escuelas, en la Síntesis Neoclásica, en las décadas del cincuenta y el sesenta del siglo pasado. Posteriormente, se narran las contribuciones de la Nueva Economía Clásica y la Nueva Economía Keynesiana, en las últimas 4 décadas, así como el consenso logrado entre ellas, en la denominada Nueva Síntesis Neoclásica.

A continuación, por la decisiva importancia que tiene el sector externo para las economías de América Latina, se hace una presentación de los avances alcanzados en el campo de la Macroeconomía de las economías abiertas, con Mundell, Dornbusch, Krugman, Obstfeld y Rogoff como sus principales protagonistas.

Al final de la sección se discute acerca del futuro de la Teoría y la Política Macroeconómica, dado el profundo cuestionamiento que han recibido a raíz de la crisis internacional de 2008-2009.

Keywords: Teoría Macroeconómica, estado actual de la Macroeconomía, síntesis neoclásica y nueva síntesis neoclásica.

Clasificación JEL: B22, E12 y E13.

ABSTRACT

The aim of this paper is to describe chronologically the evolution of macroeconomic theory since the publication of the General Theory of J. M. Keynes in 1936 until the most recent macroeconomic developments motivated by the global economic crisis of 2008-2009.

First, the developments made in the field of closed economies will be described, highlighting the contributions of Keynes and the Keynesians and monetarist's developments, as well as the consensus reached between these two schools in the neoclassical synthesis in the fifties and the sixties of the last century. Subsequently, the contributions of the New Classical and New Keynesian economics made in the last four decades and the consensus among them —the so-called New Neoclassical Synthesis— will be overviewed.

Then, given the decisive importance of the external sector to Latin America economies, a presentation of the progress made in the field of open economy macroeconomics will be conducted, with Mundell, Dornbusch, Krugman, Obstfeld and Rogoff as their leading characters.

At the end of the section we discuss the future of Macroeconomic Theory and Policy, given the sharp criticism it has received following the international crisis of 2008-2009.

Keywords: Macroeconomic theory, current state of Macroeconomics, neoclassical synthesis and new neoclassical synthesis.

JEL Classification: B22, E12 y E13.

J.M. KEYNES, NEOCLASSICAL SYNTHESIS, NEW NEOCLASSICAL SYNTHESIS AND THE CRISIS: THE CURRENT STATE OF MACROECONOMIC THEORY

Waldo Mendoza Bellido[1]

1. INTRODUCTION

Macroeconomics as a science was born with the publication of "The General Theory of Employment, Interest and Money" (GT) by J. M. Keynes, which gave rise to the so-called "Keynesian Revolution". The immediate acceptance of the GT was mainly due to the contrast between the postulates of the classical school, for which price flexibility and perfect competition automatically lead to full employment, and the Great Depression of 1929, marked by dramatic output losses and high unemployment.

The GT, in addition to propose the active use of fiscal policy to reduce unemployment, raised at the same time a general equilibrium analysis framework, substitute of the classical school's one, giving a significant boost to the development of macroeconomic theory. The GT emphasized the consumption function, the role of volatility of expectations in determining investment ("animal spirits"), the power of fiscal and monetary policy to affect the level of economic activity, and the multiplier mechanism, which amplifies the effect of changes in macroeconomic policy or investor expectations.

The publication of the GT created the conditions for an unusual development of macroeconomic theory. First, Hicks (1937), "translates" a complex book as the GT in an easy scheme, today called the IS-LM model, and Modigliani (1954, 1963), Friedman (1957) and Tobin (1969) developed the microeconomic foundations of the behavior functions presented in the GT such as consumption, investment and money demand. An alternative theory of inflation to the classic one was formulated and, finally, an attempt was made to reconcile the classical postulates with the Keynesians'. This is the stage of the Neoclassical Synthesis, a term coined by Samuelson in 1955, known as

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[1] Professor and researcher at the Department of Economics at the Pontificia Universidad Católica del Perú (PUCP).

the Golden Age of Macroeconomics. The essential message was that Keynesian tools are the best in a situation of widespread unemployment of factors of production, but once full employment is restored, the classic instrumental comes again into full force.

Thus, for almost three decades after World War II, the Keynesian view summarized in the IS-LM of John Hicks and the Phillips curve became orthodoxy in the field of macroeconomics.

But in the late fifties and sixties, Milton Friedman and his colleagues of the University of Chicago, during the hegemony of the neoclassical synthesis, continued to defend the tenets of classical economics, particularly in the field of monetary theory. Monetarism led by Milton Friedman (1968) redeems classical economics, vindicates the role of money in determining output in the short run under the IS-LM model combined with aggregate supply, questions the Phillips curve proposing an alternative theory where the variable that determines inflation is the money supply, and corrects the way of modeling expectations in macroeconomic analysis, by *endogenizing* them.

Keynesian hegemony was interrupted due to the confluence of two events, one theoretical and one empirical. In the theoretical field, the absence of micro foundations in macroeconomics led to the development of models with ad hoc assumptions. In the empirical field, the Philips curve, the tool used by Keynesians to explain inflation, became inadequate to explain the facts occurred in the early seventies, such as rising inflation along with falling economic activity.

Milton Friedman and Edmund Phelps, separately, had anticipated the shortcomings of the Phillips curve. According to them, there is no permanent tradeoff between inflation and unemployment. Instead, in a context where people have adaptive expectations about inflation, these adjust gradually and in the long run, and the unemployment rate tends to its natural level or full employment level so that the Phillips curve is vertical in the long run.

Opposition to Keynesian model and, in fact, the traditional way of doing macroeconomics, including the monetarist one, was consolidated under the

leadership of Robert Lucas, a disciple of Milton Friedman in Chicago, who introduced, the hypothesis of "Rational Expectations" based on the work of Muth (1961). This new paradigm, based on competitive markets and optimizing agents, popularized in the work of Sargent and Wallace (1975), has as one of its key findings the irrelevance of the routine use of monetary policy to affect output and employment. Thus, macroeconomic policy was declared ineffective.

Innovations continued, in line with Lucas. Until then, consensus established that economic cycles, namely, fluctuations of GDP around its long-term trend, were explained mainly by macroeconomic policy, fiscal policy as the Keynesians stated, or monetary policy, as monetarists claimed. However, real business cycles models were born in the eighties, whereby cycles are explained entirely by shocks arising from the real sector of the economy, and should not be attributed to monetary policy or fiscal policy.

Almost simultaneously, Keynesian economists reclaimed the relevance of price stickiness, but (by endogenizing it), presenting models based on rational expectations and the existence of optimizing agents, and adopting the technical instruments introduced by Robert Lucas and his followers.

Why is it that in the short term changes in aggregate demand result in changes in the level of economic activity, without any significant prices movements? Since the GT, the response to this event focused on the rigidity of prices and wages. The question that the new followers of Keynes (the New Keynesian Macroeconomics economists) attempt to answer is what are the factors that determine price and wage rigidity and, therefore, the nature of aggregate supply?

Within this framework, many models were developed in the attempt to give micro-foundations to the rigidity of wages and prices. In general, these models analyze particular markets and are not intended to explain the economy as a whole. So that, the reasons for the rigidity of prices of final goods (menu costs), the price of labor (staggered contracts and efficiency wages) and interest rates (market rationing credit) are analyzed individually.

Between late nineties and the early twenty-first century, a consensus began to consolidate between these two schools, reaching the "New Neoclassical Synthesis", term coined by Goodfriend and King (1997).

The literature outlined above assumes an institutional framework of a closed economy: these economies do not export, and neither are they connected to international financial capital markets. In these models, we could not simulate the effects on a small and open country of a rise in foreign interest rates, a decrease in terms of trade or a recession in developed countries, an analysis that is of upmost importance for most Latin-American economies. Consequently, in order to study the economies of today, we must refer to the literature on open economy macroeconomics.

Fortunately, this literature is vast and ancient. We can start recap with Hume (1752) who, in his controversy with mercantilists who stated that in order to increase the wealth of nations a permanent surplus in the trade balance was required, countered the argument of price flexibility for international adjustments, whereby if a country had a surplus in the balance of payments, domestic prices would rise, thus reducing their competitiveness and consequently worsening its trade balance.

Later, in the thirties, with the collapse of the fixed exchange rate regimes and widespread unemployment, the analytical framework of full employment and price flexibility turned to another of sticky prices and unemployment. Thus, it was proposed the option of devaluation to address simultaneously the problems of trade balance deficit and high unemployment, reviving ideas embedded in the mercantilist theory. The importance of money on external adjustments moved into the background and attention began to focus on the elasticity of exports and imports to exchange rates, and in the compliance or not of the "Marshall-Lerner" condition.

In the period immediately following World War II, when major economies were operating near full employment levels, the reactivating effect of devaluation was questioned and one of the alternatives than emerged in its place was the "Absorption Approach" postulated by S. Alexander. The main

argument of this approach lies in the fact that, if there is full employment, the positive effect of a devaluation on the trade balance occurs when the increase of local prices reduces domestic absorption compared to output.

It is, however, with the notable "The Balance of Payments" of Meade (1951), where it can be said for the first time that macroeconomic problems and policy options of open economies are shown in a systematic way, achieving the reconciliation between the absorption and elasticity approaches, among other objectives.

Furthermore, in the discussion of the advantages and disadvantages of exchange rate regimes, Milton Friedman (1971) presents a set of arguments in favor of a regime of flexible exchange rates, and, in the case of choosing between a fixed exchange rate regime and a regime of exchange rate *minidevaulations*, favored the first one.

In the context of international integration of capital markets and the choice between a fixed exchange rate or a floating exchange rate system, two papers which revolutionized macroeconomics of open economies appeared: Mundell (1963) and Fleming (1962). In these works, the IS-LM model for a closed economy developed by Hicks is extended to the context of an open economy, incorporating the trade balance as part of the aggregate demand and allowing the existence of free mobility of financial capitals flows.

In the fifties and sixties, the Research Department of the International Monetary Fund (IMF) and the Chicago University Department of Economics, with Jacques Polak, Harry Johnson and Robert Mundell, developed a particular way of analyzing the balance of payments, called the Monetary Approach to the Balance of Payments (MABP). In essence, according to this approach, the change in net international reserves of central banks may be interpreted as reflecting an imbalance in the monetary market. From this perspective, balance of payments problems are the direct result of imbalances in the monetary market and consequently, the healing must come from monetary policy.

In the early sixtees, Macroeconomics had settled as a valid approach to approximate an open economy. In the 70's, in the mid of floating exchange rates, and as a result of the work of Stanley Black (1973), rational expectations were soon introduced into open economies macroeconomics, while the asset market focus developed by Tobin (1969) came to challenge the Mundell's flow model.

The rational expectations hypothesis and of markets with different adjustment speeds reached its climax with the "overshooting" model by Dornbusch (1976). Three years after the breakdown of the fixed exchange rate system of Bretton Woods, Dornbusch's work was the first systematic attempt to explain why the exchange rate fluctuates abruptly after being left floating.

All this open economy literature of the sixties and seventies, and their own contributions to the open economy, gave rise to the new "Open Economy Macroeconomics" by Dornbusch (1980).

An extension of the work of Dornbusch was the proposition that an expectation of a future devaluation may lead to a balance of payments crisis, as a result of the loss of confidence in the ability of the central bank to maintain the exchange rate fixed in the future. Krugman (1979) took this first big step in this field.

In the early eighties, intertemporal analysis of the current account of the balance of payments began to gain importance, noting that savings and investment are derived from an optimal decision that considers the future expectations. This new approach contrasts with the Keynesian view where the trade balance is determined by the level of current income and relative prices.

The book by Obstfeld and Rogoff (1996) allows having on hand a textbook where the most important topics of modern macroeconomics for open economies can be read.

After the 2008-2009 crisis, with its epicenter in the United States, a strong challenge to both macroeconomic theory policy began. The challenge to macroeconomic theory came primarily from Nobel laureate Paul Krugman

(2009), for whom macroeconomic research conducted in the past three decades has been, in the best scenario, useless and, at worst, harmful. Moreover, the questioning of macroeconomic policy, curiously, originated in the International Monetary Fund (IMF), led by Olivier Blanchard.

This paper presents the development of macroeconomics, privileging the chronological aspect, in order to give economics' students a general and orderly overview of the evolution of macroeconomic theory. Section 2 will address the macroeconomics of closed economies, economies that do not export, do not import, and are not connected to international financial capital markets. The study of this type of economy is the most widespread in Macroeconomics. Its study begins with Keynes, through the Neoclassical Synthesis, Monetarism, the rational expectations revolution, culminating in the recent literature of Real Business Cycles, the New Keynesian Economics and the New Neoclassical Synthesis. Despite being the most widespread, closed economy models have the great deficiency of not being able to answer relevant and current questions such as the effects of a rise in foreign interest rates, the deterioration in the terms of trade or a recession in developed countries, on a small and open country as is the case for most economies in Latin American.

In section 3, the macroeconomics of open economies will be discussed. The review begins with the work of Hume, then the study the important contributions of Mundell and Fleming, the Monetary Approach to the Balance of Payments, the overshooting effect and the Open Economy Macroeconomics of Rudiger Dornbusch, culminating in the recent literature, condensed the Obstfeld and Rogoff book, "Foundations of International Macroeconomics."

In section 4, the deep questioning that has emerged on macroeconomic developments of the past three decades following the 2008-2009 global crisis and the Eurozone crisis started in 2011 will be summarized.

It should be noted that this presentation cannot and do not pretend to be, obviously, exhaustive. We are omitting a contemporary of Keynes as Kalecki who, among other contributions, rigorously explained the reasons for the

Great Depression. I am also omitting the important developments of not Anglo macroeconomics, such as Latin American Macroeconomics that developed in the sixties and seventies, basically around the Economic Commission for Latin America and the Caribbean (ECLAC). Finally, we are omitting macroeconomic theory that pretends to represent small, open and dollarized economies.

2. CLOSED ECONOMIES MACROECONOMICS

2.1 The pre-keynesian economics: classical economist

Classical economists, named that way by Keynes after the GT, represented by Adam Smith, Jean B. Say, David Ricardo, Alfred Marshall and John Stuart Mill, believed in price flexibility and perfect competition in goods and production factor markets as elements that produce auto-corrective forces of the economy that steer it quickly to its long term balance, with the full use of production factors. Imbalances (inflexible prices and unemployment) should be infrequent and temporary. Output was determined purely by supply factors and there was no possibility of under or over-production, thanks to the price adjustment mechanism which postulated Say's Law.

As postulated by Say, there is no theoretical possibility of excess supply or excess demand, given that in the first case, a reduction in the price of goods and, in the second case, as increase in these prices, guarantees the supply is always equal to demand, at any time: "supply creates its own demand".

The assumptions in which classical economics rests are the following:

- Flexibles prices and wages.
- Perfect information about prices and quantities.
- Production’s function with diminishing marginal returns.
- Competitive markets.

Essentially without departing from the principles of the classical school, this economy can be represented on the demand side with a standard IS-LM

model of a closed economy, with a goods market and a money market. On the supply side, perfect competition and flexible prices and wages ensure that the level of economic activity is at its full employment level. Consequently, given the level of economic activity, the variables to be determined in the IS-LM system are the price level, which is determined in the money market, and the interest rate, which is determined in the goods market. This approach differs from the IS-LM model from textbooks, which incorporates unemployment, where output is determined in the goods market and interest rates are determined in the money market.

a. The labor market and the determination of the output

On the side of labor supply, it is stated that a representative agent maximizes a utility function, which is increasing with respect to the real wage and leisure. From this optimization process, we obtain a labor supply function that increases with real wages.

Labor demand comes from firms, which are perfectly competitive, have a production function of diminishing marginal returns and hire workers to the point where the marginal product of labor equals real wages. A rise in real wages leads to a reduction of the employment level, so that the higher real wage may equal a similarly higher marginal productivity of labor. Consequently, the labor demand curve in terms of real wages and employment is downward sloping.

In the labor market, in terms of real wages and employment levels, labor demand (downward-sloping) and the supply of labor (upward-sloping) are combined to determine the levels of employment and real wages. The nominal wage flexibility, given the price level, will ensure that this market is always in equilibrium, through movements in real wages. Knowing the level of employment and the production function, the level of production can be determined.

A price increase reduces real wages, a fact that encourages firms to demand more workers and encourages workers to offer less work, generating an

excess demand for labor. This excess labor demand results in a rise in nominal wages in proportion to the price level, so that the real wage is unchanged and therefore neither output and employment. Thus, in terms of quantities and prices, the “classic” aggregate curve supply is perfectly inelastic.

b. The goods market and the determination of interest rates

In the classical world, the real interest rate is determined in the goods market, where savings are equal to investment or, what is equivalent, when supply and demand for loanable funds are matched.

On the side of the demand for loanable funds, namely, investment, interest rate represents the cost of borrowing to finance investment projects. Thus, a higher interest rate makes many projects unprofitable, and therefore investment decreases.

On the side of the supply of loanable funds, namely, savings (the difference between consumer income and spending in the private and public sector) is an increasing function the interest rates. Saving means postponing present consumption, and the interest rate is the price of consuming today; in this way, higher interest rates lead to less consumption and more savings in the present.

The balance between demand and supply of loanable funds, namely, between saving and investment, determines the real interest rate. Consequently, any mismatch occurred in the goods market, between savings and investment is eliminated through changes in the real interest rate.

c. The monetary market and the determination of price levels

In the classical world, in order to clarify the determination of price levels it is necessary to refer to the money market.

In the money market, on the demand side, the amount of money demanded (M^d) is a proportion (k) of nominal income (PY), where Y is the level of real

income and P is the general price level. On the supply side, the amount of money (M^s) can be considered as an exogenous variable, determined by the monetary authority.

In equilibrium, then, the equality between supply and demand for money must hold: $M^s = kPY$. If, in addition, it is stated that the coefficient k is stable and that output is determined solely by supply factors, in the labor market sub-system the identity above can become a theory of the determination of the price level, where prices are proportional to the amount of money.

d. Monetary policy and fiscal policy in the classic world

Suppose, for instance, an increase in the amount of money in the economy. In the monetary market, where the independent variable is the price level, there is excess supply that leads to a rise in the price level. In the labor market, the price level increase reduces real wages, generates excess demand in the labor market, which raises nominal wages, restoring real wages to their initial value and thus not affecting either output or employment. Finally, as in this presentation the price level does not appear in the goods market, there is no effect on the real interest rate.

If there is a rise in public spending[2], savings decrease in the goods markets as public savings decline, and, therefore, a rise in the interest rate ensues. As the interest rate is not present in the money market, there is no connection to the money market and, therefore, public spending does not affect the price level.

In summary, monetary policy and fiscal policy play no role in the determination of real variables such as output, employment and real wages. These policies only affect nominal variables; there is no connection between the monetary sector and the real sector of the economy: there is "classical dichotomy".

[2] It must be assumed that increased government spending is financed by public bonds. In this fashion, fiscal deficit has no effect on the amount of money.

2.2 The Keynesian revolution: the Great Depression and the effective demand theory

While the principles of classical economics postulated the theoretical impossibility of recession and unemployment, the Great Depression of 1929 showed that the level of economic activity, from its full employment level reached in 1929, was reduced by 40 percent through 1933, while unemployment was at a quarter of the workforce.

On the other hand, investment spending in 1932 was only one ninth the level observed three years ago, explained by an exorbitant rise of real interest rates, which in turn was due to persistent price deflation observed between 1929 and 1933, reaching 10 percent in 1931.

This inconsistency between the classical theory and the tough reality of the Great Depression explain the remarkable success of the publication of "The General Theory of Employment, Interest, and Money" by J. M. Keynes in 1936, whose essence is the layout of an analysis framework for a world in recession.

a. The goods market and the determination of output

Keynes's central idea is that recessions are due to insufficient demand, in opposition to the classics that believed that demand always fitted aggregate supply. Against the argument that "supply creates its own demand" Keynes imposed the following: "demand creates its own supply." Hence, one of the most important conclusions was the need for government intervention to drive economic activity near to its full employment level. For him, the error of the classical economists was to consider that the normal state of the economy is full employment.

The basic starting point is that the economy is operating at a level below full employment and that there are not natural forces to the market that lead the level of economic activity to its potential level. According to the principle of effective demand (aggregate demand in today's language), when the economy is operating below its full employment level, the underutilization of production factors allows that an increase in aggregate demand can lead into

an increase in the level of economic activity, without altering price levels. Demand, in turn, may rise because consumption, investment or government spending are rising.

Regarding investment, Keynes assumed that it depended on the expected productivity of new investments (or capital marginal efficiency) and the interest rate. A higher interest rate reduces investment demand, as in the classical approach. But for Keynes, uncertainty about the future profitability of the projects was the main of fluctuations in investment demand. That is, in presence of a negative belief about the future of the economy (expectations), investors would not carry out their projects no matter how reduced the levels of interest rates would be.

These fluctuations of investment, whose origin was considered exogenous, were amplified by the multiplier. Given an exogenous increase in investment, there is an increase of the same magnitude in aggregate demand which in turn generates increased production and income. The increase in income increases consumption and saving. As consumption is a component of aggregate demand, the latter increases again, leading to a further increase in output and income. The cycle is repeated until the effect is dissipated. Thus, output raises much more than the initial investment increase.

Given the volatility of the investment function which could casus severe fluctuations in output, in opposition to consumption which is stable, Keynes proposed that the government should use fiscal policy to offset the inevitable fluctuations of private investment, which now is known as counter-cyclical fiscal policy.

b. The money market and the determination of the interest rate

Regarding the interest rate, this variable is the one that balances the money market and is not determined in the goods market matching savings and investment as indicated by the classics. The money supply was considered exogenous and under the control of the monetary authority. The demand for money, or liquidity preference, is formed by the transaction, precautionary

and speculative components; the latter considered unstable. Therefore, given the money supply, variations in the interest rate follow changes in the money demand.

As explained in the previous paragraph, Keynes recognizes the link between the amount of money and the level of economic activity, through the interest rate. However, he considered that the most important factor in determining private investment were the expectations about the future, which he called "animal instincts" (animal spirits) rather than “interest rate”.

c. Monetary policy and fiscal policy in the Keynesian world

The work of Hicks (1937) allowed the GT to become more mathematically tangible, simplifying it and presenting it under a didactic model called IS-LL, IS-LM today, whose basic features are similar to the IS-LM model of a closed economy that is currently presented in textbooks.

In this presentation, the aggregate supply can be substracted as it is perfectly elastic; in terms of quantities and prices, given the assumption of unemployment of productive factors. That is, prices are exogenous. In the aggregate demand, there are two markets, goods, where output is determined, and the money market, where the interest rate is determined.

For a matter of comparison with the performance of the classical model, suppose a surge in the amount of money in the economy. In the money market, where the adjustable variable is the interest rate, there is excess supply that leads to a reduction in the interest rate. In the goods market, the falling interest rate raises investment, increasing demand and the ensuing excess demand is eliminated via rising output.

Since in this presentation the price level is fixed, labor market and aggregate supply dynamics can be subtracted.

Regarding fiscal policy, in Keynesian conditions of under-usage of production factors, a rise in public spending increases demand and consequently output.

The elevation of output is further amplified by the increase in private consumption.

In the money market, raising output increases the demand for money, and given the money supply, the interest rate rises affecting private investment, weakening, but not eliminating, the expansionary effect of the increased government spending on output.

In summary, in the Keynesian world, monetary policy and fiscal policy do play an important role in the determination of output and employment, in opposition to the tenets of classical economics, where these policies were irrelevant to the determination of the real variables. In this view, there is no dichotomy between the real sector and the financial sector.

2.3 The Neoclassical Synthesis

Developments of the GT blended the 45° diagram by Hansen, the IS-LM model of Hicks and the Phillips curve, which became part of the macroeconomic apparatus of that time, into a new stream of macroeconomic theory known as the neoclassical synthesis. The term was used by 1970 Nobel Laureate Paul Samuelson in his popular economics textbook to refer to the integration of many of Keynes's ideas with those of his predecessors:

> "In recent years, 90 percent of American economists have stopped being Keynesian or anti Keynesians. Instead, they have worked towards a synthesis of whatever is valuable in older economic theory and modern theories of income determination. This result can be called neoclassical economics and is accepted, to a larger extent, by all but five percent of writers of the extreme left wings and extreme right" (Samuelson, 1955, p. 212).

In the period between 1940 and 1970, there were major developments in macroeconomics and, according to Blanchard (2010), we can talk about this period as the "golden age" of Macroeconomics. Besides the development of the IS-LM model, there were made major advances in the study of the behavior functions that were behind this model: consumption, investment and

money demand. Also, macro-econometric models were developed in order to attempt to quantify the hypotheses derived from theoretical models. Moreover, at the same time, the neoclassical economic growth model of Solow was developed in order to study the determinants of economic growth.

a. The IS-LM model, the Phillips curve and empirical developments

The IS-LM model, developed by Hicks (1937), is a unit of analysis that attempts to summarize in a simple model of three markets, one of which is residual, a complex text such as the GT is. The IS curve represents equilibrium in the goods market taking as a exogenous variable the interest rate, while the LM curve shows the equilibrium in the money market and takes output as exogenously determined. The intersection of the IS and LM determine output and the interest rate[3].

Furthermore, Phillips (1958)[4] found as empirical regularity the existence of an inverse relationship between the growth rate of nominal wages and the unemployment rate. Later, this relationship was associated with the fact that a lower unemployment rates pushes up nominal wages and since they represent the labor costs of a typical business, higher wages are linked to rising prices. Furthermore, as wage negotiations between employers and employees inflation expectations of agents are taken into account, the notion of expectations on the inflation rate was introduced. Finally, recession and unemployment were considered short-lived and the notion of "natural rate of unemployment" was introduced. Thus, aggregate supply prevailed in the Keynesian analysis apparatus and also the notion that, in the short term, it could reduce unemployment at the cost of higher inflation.

With this basic equipment that combines the IS-LM model and the Phillips curve, it was possible to determine the main variables of interest for a macroeconomist: output, employment, interest and inflation rates.

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[3] For a modern presentation of the IS-LM model, see Blanchard (2010).

[4] Fisher (1926) had already shown the presence of a statistical relationship between inflation and unemployment.

After the IS-LM-Phillips curve model engrained in macroeconomic theory as the unit of analysis that enjoyed widespread consensus, a piece was still missing: assigning numerical values to the parameters such as the marginal propensity to consume, the propensity to invest or sensitivity of money demand with respect to the interest rate, to make macroeconomic forecasts, or to simulate economic policy mix. In short, they needed to test the main hypotheses derived from theoretical models.

This task was first developed by Klein, University of Pennsylvania, during the first years of the 1950s, followed later by Modigliani of MIT.

b. The microeconomic foundations of macroeconomics

Concurrently, other important developments took place in specialized journals in the fields of the theory of consumption, investment and liquidity preference.

The developments of Friedman (1957), with the theory of consumption based in permanent income, and Modigliani (1954, 1963), with the theory of consumption based on the life cycle hypothesis constituted a major advancement in the study of the determinants of consumption, given that Keynes had considered that this variable was associated only with current income.

Friedman's model indicates that a person plans a stable level of consumption as a function of permanent income, defined as an average between current income and future income that the agent expects to receive over his lifetime. Although future income is uncertain, the model includes the formation of expectations as an important feature for its application.

Modigliani proposes an application with emphasis on the behavior of income throughout the life of the agent. The individual wants a stable consumption level, therefore, when he is young and has a low income, usually borrows since he expects to have higher earnings in his productive stage of his life cycle. When he is old and his income lies below his consumption expenditure level, the individual “dis-saves”. For this system to operate, it must be

assumed the existence of a developed financial system where people have full access to it.

In the study of factors influencing investment, the work done by Tobin (1969) is outstanding since it introduced the famous concept of "Q Theory" based on the expected present value of future profits of capital[5].

The q's Tobin is the ratio of the cost of acquiring the company in the financial market (the stock market) and the value of capital stock at replacement cost. By monitoring the Tobin's Q, the company can assess the proper timing to finance a new investment project by issuing shares. If it is greater than 1, the stock price of capital in the financial market is greater than their replacement cost. So the company can issue shares to increase its investment in a profitable way.

Tobin's theory has served as a basis for the development of other contributions to understanding financial markets.

On the other hand, in the field of money demand, Tobin (1956) and Baumol (1952) contributed separately to the theory of money demand, from an inventory approach. The starting point of these theories is that money is basically a medium of exchange and bonds are a store of value. This theory holds that families make a portfolio decision, keeping a portion of wealth in cash and other portion in different assets that earn interest. This decision is based on liquidity, performance and risk.

When families need money for their transactions, they face a "trade-off" between the return they miss to earn and the transaction costs of converting other assets into money. In a given period, the family uses an amount of money for its expenses, when it runs out of money, returns to the bank for the same amount, the process of exchanging money for bonds and vice versa is permanent, and generates a transaction costs. The higher the cost, the greater the demand for money.

[5] Discounted value of future dividends that the company pays per unit of capital.

c. The economic growth model by Solow.

In 1956, Robert Solow, a Nobel Laureate in economics in 1987, and professor at MIT, published a paper to explain economic growth experienced after the Second World War. The basic assumptions of the model are:

- Production of a single homogeneous good, using a production function that uses two factors, capital and labor.
- Competitive economy.
- Full use of production factors.
- Closed economy, without government.

Output, given certain amounts of capital and labor, will depend on the state of technology. Moreover, when the capital stock grows faster than the number of workers, capital intensifies raising per capita production, the marginal product of labor and wages. Furthermore, if technology remains constant, capital shows diminishing returns, which makes the rate of return on capital decrease.

The Solow model is based on two basic equations. The first equation of the model is a production function with diminishing marginal returns, a Cobb-Douglas type, which links output per worker with capital per worker.

The second is the national accounts identity of a closed economy without government, where the net accumulation of physical capital equals gross investment minus depreciation. Gross investment, in turn, is funded by private savings, the disposable income of families do not intend for consumption. When investment per worker is greater than the depreciation of physical capital per worker, capital per worker rises; the opposite occurs when depreciation per worker is higher than investment per worker.

The production function in terms of output per worker (y), is neoclassical, Cobb-Douglas type, with exogenous technology (A), where $k = K / L$ is capital per worker[6].

$$\frac{Y}{L} = y = Ak^{\alpha}, \quad 0 < \alpha < 1 \tag{1.1}$$

On the other hand, the net accumulation of capital ($\dot{K}$) is equal to gross investment, which is equal, by the identity of the national accounts, to private saving (S), less depreciation of physical capital, which is assumed as a fixed proportion of capital stock (δK).

$$\dot{K} = S - \delta K \tag{1.2}$$

If private savings are, in turn, a constant proportion of output ($S = sY$), the preceding equation becomes,

$$\dot{K} = sY - \delta K \tag{1.3}$$

Using lowercase letters to identify the variables in per capita terms,

$$\dot{k} = sy - \delta k \tag{1.4}$$

Substituting equation (1.1), the production function in equation (1.4), we obtain the fundamental equation of the Solow model,

$$\dot{k} = sAk^{\alpha} - \delta k \tag{1.5}$$

According to this equation, capital per worker rises when gross investment per worker, sAk^{α}, is greater than the depreciation per worker (δk).

In the steady state, capital per worker must remain constant ($\dot{k} = 0$). Introducing this condition in the above equation renders:

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[6] Since we have assumed that the entire population is employed, output per worker is equal to output per capita. Therefore, we will use both terms interchangeably.

$$sAk^{\alpha} = \delta k \qquad (1.6)$$

In this summary of the Solow model, in which equation (1.3) stands out, given a level of capital (and output) per worker, an increase in the savings rates, by raising domestic savings, ceteris paribus, increases gross investment per worker and places it above depreciation. As investment is higher than what is necessary to replenish capital wear, capital stock per worker raises and, given the production function, output per worker also increases.

On the other hand, it may also be noted that another key conclusion of the Solow model is that the savings rate does not affect economic growth, but it does affect the level of output per capita in the long run.

Although the basic economic growth model is exogenous, the Solow model laid the foundations for greater developments in economic growth literature in recent years, the so called convergence literature, which explains why some countries grow at rates higher than others.

d. The monetarist counter-revolution.

Advances in macroeconomic theory between 1940 and 1970 led to the belief that predicting the future course of the economy could be done with relative accuracy, based on the IS-LM model and the Phillips curve with downward sloping in the short term.

However, in the 1970s, the main tenets of macroeconomic theory collided with reality again, as happened with the classical theory in the crisis of 29. While the theory affirmed that inflation was the result of an excess of demand and therefore was pro-cyclical, rising when the level of economic activity rose and falling when it fell, the facts showed that inflation rose, while activity levels decreased and unemployment increased: consensus began to crack.

Timing was propitious for the rise of monetarism led by Milton Friedman. This stream of economic thought stated that we were still far to understand the functioning of the economic system and focused its criticism on three aspects:

the effectiveness of monetary policy versus fiscal policy, the Phillips curve and the role of economic policy.

On the role of money, Keynes' rejection to the use of monetary policy to stabilize fluctuations had two origins. First, the belief in the existence of a "liquidity trap"[7]. Second, the belief that the supply of money indeed increased during the Great Depression proving to be ineffective in the recovery of the economy.

The framework of the neoclassical synthesis, namely the use of the IS-LM and the Phillips curve, provided a larger scope for money.

Friedman and Schwartz (1963) laid the grounds for the monetarist critique on the role of money in the Great Depression studying U.S. monetary performance over a period of 100 years. The most important discovery of the study was that the amount of money, instead of rising, had been reduced by about a third between 1929 and 1933. Therefore, the Great Depression was an example of the importance of money in the economy.

Moreover, Friedman believed that the demand for money was stable, as opposed to Keynes, which led him to believe in the validity of the quantity theory of money, but only in the long term. Thus, a rise in the amount of money make people have more money than they want and thus they would buy more, raising output and prices in the short term, while in the long run only prices would be affected.

Regarding the Phillips curve, Milton Friedman (1968) and Edward Phelps (1967) postulated that full employment was an ideal and the real economy there are always inevitable frictions explained by structural factors, such as job searching, which would lead to suggests the existence of a "natural" rate of unemployment.

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[7] The liquidity trap implies that a rise in the amount of money could originate an increase in the demand for money, which would keep interest rates from varying widely and, therefore, the effects on aggregate demand would not be significant.

For Friedman, expansionary monetary policy reduces unemployment in the short term but not in the long term. As far as agents anticipate increasing prices, the Phillips curve would shift upward reaching the level of natural unemployment with higher inflation. Thus, there is not a trade-off relationship between inflation and unemployment in the long term.

To illustrate the effect suppose that an expansionary monetary policy initially achieves an economic recovery: with higher sales, few people are unemployed and those who leave their jobs find another quickly, i.e. unemployment decreases. However, as times passes, money has effects on prices; people can expect a higher rate of inflation and a consequent deterioration in the expected real wage, lowering labor supply. As far as the high cost of living is eliminating the initial boom, unemployment will increase, reaching its initial level or natural level.

In short, if the authorities would try to exploit the trade-off between inflation and unemployment, this exchange would disappear since the Phillips curve is vertical in the long run.

The stagflation of the seventies bestowed some reason to the arguments proposed by Friedman and Phelps.

e. Rules versus discretion.

Finally, in the controversy over rules and discretion, the Keynesians are sympathetic to the possibility that governments can precisely manipulate the instruments of economic policy to achieve the desired results, hence the bet for an activist behavior of the state. Friedman, by contrast, relied less on the role of macroeconomic policy, largely because of the difficulty of predicting its impacts because, since the implementation of economic policy up to its impact on prices, there was a fluctuating and unpredictable delay.

According to his research, there were cases in which the authorities have acted in the wrong direction, as in the Great Depression; and in others, although they acted properly, intervened so late that the situation worsened.

Therefore, in terms of economic policy, suggested that money should grow at a constant rate. Although he believed in the effectiveness of monetary policy, he supported the use of simple rules, as opposed to the Keynesians who advocated a more discretionary[8] fiscal policy. Fixed rules would provide a framework for price stability and would favor agents' economic confidence.

2.4 The school of rational expectations[9]

Friedman's criticism was reinforced by Lucas by establishing that Keynesian economics failed to introduce expectations. In the mid-1970s, two events, one empirical and one theoretical[10], introduced to Macroeconomics in deep crisis.

First, as mentioned in the previous section, as opposed to the IS-LM-Phillips curve device from where an inverse correlation between the inflation rate and the unemployment rate was derived; the facts contradicted the prevailing theory postulates as occurred in the Great Depression: higher inflation coexisted with a higher level of unemployment[11].

Second, the divorce between Macroeconomics and Microeconomics, since the latter was rigorous in specifying the behavior of the agents, while the former only proposed equations in an arbitrary or "ad hoc" way. Also, since the time of Keynes and for many years, models considered expectations as exogenous or static.

Although Keynes had recognized expectations as an important factor in the determination of aggregate demand, he also acknowledged the difficulties that would appear in attempting to model them. Given its importance in explaining the volatility of investment demand, it was necessary to find a way to use them. Finally, Keynes chose to describe them as subjective states in the minds of individuals who, from time to time, received shocks of optimism

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8 For a summary of Friedman's monetary thought, see Friedman (1968).

9 The collection of classic articles on the subject can be seen in Miller (1994). See also Begg (1982) for a discussion of intermediate level.

10 For more details see Mankiw et. al.(1992).

11 Process that was called stagflation.

and pessimism. That is, he decided to consider them as exogenous in the short term.

Cagan (1956) introduced the concept of correction of expectations about the future, which allowed us to adjust expectations based on previous errors, known as the adaptive expectations hypothesis. So, it seemed correct to think that people's forecasts were based on past history[12].

Decades later, a critical analysis began on the relationship between inflation and unemployment. Lucas (1972) and Sargent (1972) made two important reviews about the wage adjustment mechanism for the Phillips curve and the assumption of adaptive expectations.

Lucas, on the basis of the work of Muth (1961), introduced with great success the rational expectations hypothesis. He indicated that economic agents formed their expectations considering all the relevant information available at the time of making his prediction; not only past information. Thus, agents did not incur in systematic errors. If they were wrong before, they would try to look for new information that will help them to improve their prediction.

These contributions contributed to the use of rational expectations in economic models that led to two important implications. The first was to reduce the power of macroeconomic policy, as governments could not systematically fool people since agents formed their expectations rationally. The second was that it laid the groundwork to start closing the methodological gap between Macroeconomics and Microeconomics.

a. Rational expectations.

The adaptive expectations hypothesis implies that agents make systematic errors and implies that agents do not learn from their bad predictions. To illustrate this concept consider the following example. Suppose that the prediction of a variable, say expected inflation, is exactly the value that it took in the previous period, of 5 percent annually. If the variable actually grows by

[12] Each past value was weighted by a coefficient, whose sum was equal to unity. This ensured that the prediction of a variable that has remained constant for a period of time is equal to the actually performed.

1 percent each period, in the first period predicted inflation will be 5 percent and the effective inflation rate will be 6 percent, which gives us a prediction error of 1 percent. For the next period, the predicted inflation will be 6 percent and the performed will be 7 percent, and the prediction error is 1 percent. This process is repeated period after period, agents make mistakes because his prediction in each period will underestimate the true value. That is, systematically prediction error in each period is 1 percent. After 1000 periods agents will continue making the same prediction error. So is it reasonable to assume adaptive expectations? The answer becomes another question: Is not it better to assume that the agent learns the rule governing the variable grows?

Lucas argues that a theory of expectations should be based on rational behavior of individuals. Agents exploit all available information at the time where they predict the course of a variable. One implication is that agents tend not to repeat their mistakes.

The agents' expectations about the future are important to their current decisions, in turn, the decisions made today affect the result of the economy. Given this circularity of causality, rational expectations lead us to think about how they might be affected agents' expectations by introducing a drastic change in the government's economic policy.

Thus, a macroeconomic model that considers all relevant information, takes into account the structure of the economy, the model parameters and past and present actions of those who decide economic policy. Of course, it also incorporates the various measures that may be taken by the government in the future[13], which corresponds to a training scheme of expectations for the economic model.

The procedure in models with rational expectations assumes that agents solve the model in which they operate. Lucas (1972a), Barro (1976) and Sargent

[13] For the reader with statistical knowledge, the rational expectations hypothesis can be defined as: the subjective probability distribution of the agent conditional on the information he has should be equal to the objective probability distribution, conditioned by the level of information. A mathematical explanation is in Argandoña, Gámez and Mochón (1997) Volume I, Chap. 3.

(1972) have developed operational methods to solve systems of general equilibrium with rational expectations.

b. The Lucas critique.

As noted above, under the consensus of the neoclassical synthesis, several macro econometric models had been developed to guide economic policy decision-making. Using the hypothesis of rational expectations, Lucas (1976) argued that these models could not be used to make decisions on governments[14].

The explanation is as follows. If we accept that the structure of econometric models tries to capture the behavior of agents who have rational expectations, model parameters correspond to the rules of economic policy implemented by the government. A policy regime change causes a shift in expectations of agents and these changes, and therefore, the model parameters do change too. Thus, evaluating a policy change from historical data can lead to invalid results. To address this deficiency, macro econometric models should be estimated using parameters that are independent of the policy regime.

Two points are important. First, as pointed out by Lucas, it should be clear that this review has nothing to do with the degree of fit of the model to historical data associated with a particular political regime. Second, in a strict sense, it is stated that the parameters will change, but we do not know if they change or not. Indeed, in case they change, the results of the prediction will be incorrect.

c. Ineffectiveness of economic policy, the Phillips curve and the theory of ricardian equivalence

In a controversial article, Sargent and Wallace (1975) argue that under the assumption of rational expectations, the expected changes in economic policy, both monetary and fiscal, have no effect on the level of production and

[14] In Lucas (1987) can be found its main contributions to macroeconomic theory.

employment, even in the short term. This has been called "the theorem of the irrelevance of economic policy."

This work was controversial, given that as a result of the review of Friedman and Phelps and the Phillips curve, the prevailing consensus was that this had a negative slope in the short term and was vertical in the long run. That is, it was firmly believed that there was room for economic stabilization policies, at least in the short term.

However, in the model of Sargent and Wallace, operators and the government have the same information about the policy rule. Once the public learns that rule, whether simple or complex, the effects on output and employment are null.

For example, a monetary expansion, in the traditional mechanism, reduces the interest rate, increases aggregate demand, output and prices. With rational expectations, this mechanism and results are expected by the agents. Higher prices expected are taken as an adverse supply shock and will cause a rise in prices and a drop in production, which returns to its original level[15].

In the discussion of the above paragraph there are two elements necessary for the fulfillment of the proposition of Sargent and Wallace: monetary policy has to be foreseen by agents and the announcement of the policy change has to be undertaken before you perform the negotiation wages.

On the fiscal policy side, the performance of the Ricardian equivalence theory, first raised in the early nineteenth century as a curiosity by the English economist David Ricardo and later developed by Barro (1974), leads to a similar result: fiscal policy is rendered ineffective.

The basic idea, which will be developed in Chapter 6 of this book, is that the government has to respect a budget constraint at all times: government expenditures are financed by taxes and the government cannot die indebted.

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[15] Stanley Fisher (1977) showed that with rational expectations and sticky wages the proposition of Sargent and Wallace failed.

When considering a long-term horizon, government spending will have to be financed ultimately with taxes. If, for example, public spending rises today, this expenditure can be financed with higher taxes or borrowing. In the latter case, to pay the principal and interest of the debt, the government will have to raise taxes in the future. Therefore, government spending is financed, in fact, with taxes today or taxes in the future: there is no other form of financing in the long term.

If economic agents have rational expectations, in its extreme version of perfect foresight, that is, think ahead and know the intertemporal budget constraint of the public sector, they will realize that the tax cut is temporary because, to comply with the payment of the debt generated by the tax cut, and related interest expenses, the government will raise taxes in the future. Accordingly, the present value of income (human capital) remains constant and so fiscal policy does not affect consumption or aggregate demand.

Macroeconomic policy, whether monetary or fiscal, in the presence of rational agents, has no effect on the level of economic activity. If ineffective, macroeconomic policy can be dispensed.

d. Game theory

As noted above, under the hypothesis of rational expectations, changes in expectations of economic agents facing a change of policy regime, affect the economic result. Therefore, it is convenient to use a theory that takes into account the strategic interaction between the government and other economic agents.

The pioneering work developed by Kydland and Prescott (1977) [16] traced the path to follow. In their work they indicate that economic policy is not a game against nature, but against rational agents. For this reason, the proper equipment for analysis should be game theory and optimal control theory, widely held at the time.

[16] Thanks to this work and that of 1982, to be discussed later, these authors have been awarded whit the 2004 Nobel Prize in Economics.

This work demonstrated that economic policy derived from optimal control was inconsistent, and also led to an undesirable economic result. To illustrate this point of view, we use the example of stabilization policy which assumes a downward-sloping Phillips curve in the short term and in the vertical curve in the long run.

At first the government announces a policy of zero inflation[17]. Based on this announcement, agents form their expectations of inflation and the economy reaches its long-run equilibrium with a level of zero inflation and unemployment at its natural rate. Once the agents have set their expectations and therefore their wage contracts, for example, the government may be tempted to reduce unemployment at the cost of inflation. Indeed, the government allowed an increase in inflation to the point where the marginal gain by reducing unemployment compensates the loss for inflation[18]. In this fashion, the government obtains an unemployment rate lower that the natural unemployment rate and a positive inflation rate.

But the story does not end here. Agents finally figure out this "move" and discover that inflation is higher than expected, adjust their expectations, shifting the short-term Phiillips curve to the right. The ultimate long-run equilibrium is obtained with positive inflation and the natural rate of unemployment. That is, a worse result than in the base case with zero inflation and the unemployment rate at its natural level.

Even worse, since agents anticipate this behavior of the government, whenever there is an announcement to maintain low inflation, it will not be credible, since agents know that sooner or later the government will act to break its promise, namely, there is dynamic inconsistency in economic policy.

The important lesson to be drawn from this is that governments should seek to make their promises credible, and thus perform better. Barro and Gordon (1983), Backus and Drifill (1985) and Tabellini (1985), among others, using

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17 To say that is zero or any positive number does not alter the conclusions.

18 We are assuming, as it is evident, that inflation and unemployment are undesirable for society.

the framework of the theory of repeated games, show that by generating reputation it is possible to eliminate the problem of dynamic inconsistency.

On the specific issue of monetary policy, in a widely cited article, Rogoff (1985) proposed ways to overcome this drawback. One of these is to choose a central banker with a great aversion to inflation[19] and who lead the institution independently from the government. This hypothesis is consistent with the data, as empirical work carried out by Cukierman (1992) and Alesina and Summers (1993).

2.5 The theory of Real Business Cycles

Economists, from Irving Fisher, and both keynesians and monetarists, note that there are two important elements to understanding business cycles. First, you need to specify the determinants of nominal aggregate demand. Second, it requires splitting these changes in aggregate demand between changes in output and changes in prices[20].

From the perspective of real business cycles, initiated by Lucas (1975) and popularized by Kydland and Prescott in 1982 winners in 2004 of the Nobel Prize in economics, this study path is wrong, as the changes in aggregate demand translate immediately in price changes; thereby, to understand fluctuations in the level of economic activity, it is necessary to look for a different explanatory angle.

What are the determinants of macroeconomic fluctuations? According to the prevailing theory, preceding the real business cycles, economic cycles are explained primarily by macroeconomic policy; fiscal policy —as the Keynesians proposed— and monetary policy -as monetarists declare-.

The fundamental assumption of the school of real business cycle is that it explains what happens to the level of economic activity in the long term, and economic growth theory can also be used to explain economic fluctuations, i.e. exaggerating the argument, it can be assumed that the actual level of economic

[19] The aversion must be greater than the rest of citizens.
[20] View Bradford DeLong (2003).

activity is always near its potential level: the classical dichotomy embedded to the short-term.

According to this new theory, neither fiscal policy nor monetary policy explains the business cycle. The latter has technological shocks as a main explanatory source, which are the driving force behind the economy: Technological factors affect the production function, the determinants of output and employment, nominal variables such as money supply play no role in explaining economic fluctuations[21].

Monetary policy has little impact on employment and output, and the observed association between the amount of money or the interest rate with employment or output is a reaction of to the amount of money or the interest rate to changes in the level of economic activity, and not in the opposite direction as postulated in the Keynesian or monetary conventional theory.

Economists of this school use the same framework developed to analyze economic growth, with two basic variants: the incorporation of leisure in the utility function and also productivity shocks. As noted by Barro (1986), these models are characterized by: (i) competitive markets (ii) the existence of a representative individual who maximizes an intertemporal utility function (iii) a neoclassical production function, subject to stochastic shocks. Given the absence of imperfections, it is not surprising that the results are Pareto-efficient[22].

According to this strand of thought, unemployment is a natural and efficient response of the economy to adverse shocks. To give us a simplified but useful idea of the operation of a basic model of real business cycles, we will use the Robinson Crusoe economy[23].

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21 This is to say that the aggregate supply curve is vertical, even in the short term.

22 Miller ob. cit., in part four, includes classic articles on this topic. You can also see Romer (2002) and Blanchard and Fisher (1989) Chapters 4 and 7, respectively.

23 The parable described below is taken from Mankiw (1997).

a. The Robinson Crusoe economy.

Robinson is the only inhabitant of the island and its only activities are fishing and leisure. We assume that he has a conventional utility function that depends positively on fish consumption and leisure.

In this framework, the individual will choose the level of hours of work when the welfare obtained by the number of fish caught in one hour equals the foregone profit per hour of leisure. If everything is held constant, it is expected that the number of hours worked will be the same every day.

Suppose that one day the number of fish increases exogenously, equivalent to a positive supply shock. The natural response of Robinson will be fishing more hours today, as the number of fish that we would obtain would compensate the disutility of leisure time sacrificed; leaving to the future more rest. As a result, this economy's GDP rises, along with employment.

Alternatively, when a negative shock, say because there was a temporary stream of hot water, Robinson would prefer to stay in his cabin, as it is very little the amount of fish that he would harvest. In this case, there is a recession and higher unemployment. An important point to note is that the decision not to work is voluntary, i.e., unemployment is voluntary.

Thus, fluctuations in GDP in Robinson's world are natural responses to exogenous shocks, employment fluctuations are also efficient responses to the economic environment; if it is true that in the case of negative shock there is a decrease in Robinson's utility, the result is a Pareto optimal because there are no imperfections in this economy.

This is, then, in essence, the theoretical explanation of the real business cycle (RBC) to fluctuations in the economy. As can be seen, in this framework of analysis, there is no room for monetary policy.

b. Calibration and simulation.

Economists of Real Business Cycle contrast their models through what is known as the method of calibration/simulation[24]. Calibration means the choice of model parameters based on economic data. With these parameters, the model is closed, in order to perform the simulations.

To be more explicit, suppose that the model has a Cobb-Douglas production function and a utility function expressed in logarithms, $F(k,l)=k^{\alpha}l^{1-\alpha}$, $u(c,1-l)=\phi\log(1-l)+(1-\phi)\log c$,where c denotes consumption, l denotes hours worked[25], and k the capital stock. For the exercise, it is necessary to have the value of the parameters α and ϕ. The first is obtained as the average observed in the share of capital in total output for a given number of periods, while the second is the average fraction of leisure time (those not engaged in labor issues) [26].

Once the values have been assigned to the parameters of the explicit forms of the model functions, and given the assumed probability distribution for random shocks, simulation proceeds. In the basic models, given an initial capital level, for each sequence of realizations of random shocks, the model generates an optimal equilibrium response of consumption, worked hours, investment and output levels.

From these series, the variances and correlations of the predictions of the theoretical model are calculated in order to compare them with the data actually observed[27]. The variances are used to see how far GDP fluctuations are explained by technological shocks, and correlations with GDP, to verify the cyclical or anti cyclical behavior of economic variables.

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[24] For a more detailed explanation, see Prescott (1986).

[25] Usual normalization in this type of models considers that the amount of leisure time and labor sum to unity.

[26] Note that the requirement of information is at the micro level.

[27] Here it should be noted that for each path of the simulation we obtain the variance of each variable and their respective correlation with GDP. For this reason, the data which is taken into account is the simple average of all simulations. For example, assume that only two paths are simulated. If the correlation between consumption and GDP in a path is 0.7 and the other simulated path is 0.8, the correlation will be taken as given by the model is 0.75.

c. Review to the basic model[28].

On the functioning of the labor market, as noted, theorists of this school believe that the number of hours worked is an optimal response to the state of the economy. When work has very low productivity individuals choose to work less, take a vacation and/or spend more time with the family.

Critics point out that when people stop working, is not because they have chosen not to do so but because they have lost their jobs. The high level of unemployment in recessions implies that the labor market is not in equilibrium, people are not voluntarily unemployed.

On the nature of technology shocks, as we saw Robinson's ability to fish depends on exogenous events affecting his production function, his technology. In this framework the theorists explain that recessions are the result of technological retrogression.

Critics point out that there are many persistent fluctuations in the economy. They accept that the rate of accumulation of technological progress may decrease, but there is not a technological setback. They also claim that the negative shocks on the supply side, as the oil shock, are an exception.

However, criticism is centered on the role of money in determining economic cycles. For theorists of Real Business Cycles, money supply is not important in determining output. They say that those who believe in money-output causality are wrong, because the amount of money responds endogenously to the higher level of activity.

Critics argue that the operation of the Federal Reserve with its impact on the American economy is concrete evidence that decisions about the amount of money, changing the interest rate, lead to changes in the level of output and employment.

In this controversy, it is important to consider the views of Robert Lucas who, in an interview with Usubiaga (2002), recognizes that the omission of money in the

[28] In this regard, see Summers (1986), King and Plosser (1984) and Mankiw (1989).

explanation of economic cycles is one of the most glaring errors of real business cycle theorists, originated in his article.

When asked about the latest developments in the field of Real Business Cycles, Robert Lucas responds that, in his 1975 article:

> "(...) was a dead end (....) I think the article by Kydland and Prescott (1982) was inspired by him. The price Kydland and Prescott had to pay is that they could not talk about money. To me, that's a very high price (laughs). I think money is a major source of economic cycles"(Own translation, Usubiaga, 2002, p. 242).

However, the current consensus revolves in that the main methodological contribution made by business cycle literature has been to provide an alternative way to study macroeconomic models starting from solid microeconomic foundations, incorporating stochastic and dynamic components, many of which were not present in traditional analysis. Indeed, the Royal Swedish Academy of Sciences (2004), documenting the work of the winners, said that

> "Kydland and Prescott showed how variations in technological development, the main source of economic growth, may cause long-term economic fluctuations. In this attempt, offered a new and operating paradigm for macroeconomic analysis based on microeconomic foundations. The work of Kydland and Prescott has transformed academic research in economics, as well as practice of macroeconomic analysis and of policy making "(Royal Swedish Academy of Sciences 2004, p. 2).

At this stage of development of Macroeconomics, new intellectual leaders felt that there was almost nothing to rescue from J.M. Keynes. When asked about the current status of Keynes' ideas, Robert Lucas responded bluntly:

> "I think the current influence of Keynes as an economist, at a technical level, is close to zero, and has been close to zero for fifty years. Keynes was not technically a good economist" (Own translation, Usabiaga 2002, p. 240).

Consequently, according to Lucas, it was not worth to continue teaching with Keynesian IS-LM type models. Asked about whether he considered appropriate to continue using this model, the Nobel laureate said:

> "No, it is an outdated model. It is a textbook model. If we want to talk to people who read outdated textbooks, then we should study it "(Own translation, Usabiaga 2002, p. 240).

2.6 The New Keynesian Economics

Why is it that changes in aggregate demand result, in the short term, in changes in the level of economic activity, without observing a significant movement in prices? From the GT, the response to this event focuses on the rigidity of prices and wages. The question that the new followers of Keynes —economists of the New Keynesian Macroeconomics— attempt to answer is: what are the factors that determine the inflexibility of prices and wages and, therefore, the nature of aggregate supply?

The New Keynesian Economics consists of a large group of economists, whose contributions were made between 1970 and 1990, who accept the rational expectations critique, but believe that fluctuations in the economy are a market failure, and not a Pareto-efficient response. The latter justifies state intervention in the economy.

Within this framework, models that attempt to give micro foundations to the rigidity of wages and prices were developed. In general, these models analyze particular markets and are not intended to explain the economy as a whole. The reasons for the rigidity of final good prices, wages and interest rates are analyzed individually.

Here, we present the main contributions of the new Keynesians[29], in the field of the imperfections in the goods market, the labor market and the credit market.

[29] See Argandoña (1997), Volume II, Sec. 2 to 6 and Mankiw and Romer (1992).

a. Imperfections in the goods market.

Menu costs.

According to this theory, given a change in demand prices do not adjust immediately, because the benefit of doing so is less than the menu costs[30]. Menu costs refer to those costs which are generated by changing prices. Examples include the time required to inform consumers, loss of customers (annoyed by the frequent changes in prices)[31], meetings to pass resolutions, possible price wars, reprint sales catalogs and forwarding them to the customers.

The original model proposed by Mankiw (1985) is of imperfect competition, and seeks to explain price rigidity. Firms have some market power to set prices, unlike traditional Keynesian models that assumed that the product market is perfectly competitive. The rationality of firm behavior implies that prices vary only to the extent to the benefit of doing so is greater than the cost generated. In the same token, Akerlof and Yellen (1985), using the idea of firms with incomplete rationality encounter a situation where firms may decide not to raise prices facing an increase in demand.

The basic idea behind these two approaches is the following. If firms choose an optimal price such as P, when facing a demand shock due to a rise in the amount of money, the new optimal price may remain at P due to the existence of menu costs or firms with incomplete rationality. Thus, firms decide not to increase prices, and respond by adjusting the amount they produce, causing fluctuations in output and employment[32].

Critics consider that if it is true that these costs exist, they are so small that they cannot help explain large recessions. They note that if by lowering prices firms may dampen the negative effects of a recession, why is it that firms do not do this in practice?

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30 The idea was originally raised by Mankiw (1985).

31 While consumers consider reasonable prices change to changes in costs, they would be too displeased when changes are due to changes in demand.

32 Empirically the existence of menu costs has had support in some industries. See Cechetti (1986) and Carlton (1986).

According to theorists, there is a demand externality that explains this behavior. If a firm lowers its price, it is unintentionally benefiting others. A price drop, by raising real balances shifts the LM curve to the right and increases the demand for goods of all firms in the market. However, the individual firm decides to lower its prices only to the extent where it compares the individual benefits of slashing prices against menu costs. By not considering the added benefit that it generates, it can decide to keep the price unchanged, although it might be better for the economy as a whole that the firm decides to reduce prices[33].

The staggered pricing.

A real fact is that firms do not set their prices simultaneously, but at different times; therefore, firms do not adjust prices in proportion to an increase in aggregate demand[34].

In this sense, Fischer (1977) and Phelps and Taylor (1977) showed that the existence of long-term staggered contracts can generate the fact that changes in demand that may have persistent effects via a slow adjustment process of prices, even in the presence of perfect foresight and rational agents.

Taylor (1979) shows that if contract negotiations are staggered and are valid for a period of time, firms would not want their prices to differ much from the rest of firms. The reason is that firms that adjust prices immediately after the increase in demand do not make a full adjustment to prevent that the relative price of their good increases, which would cause a subsequent loss of customers and market share, relative to companies which have not yet adjusted their prices. By the same reasoning, when the latter have to adjust prices, they do it slightly. Consequently, prices increase only gradually[35].

Despite how arbitrary the staggered pricing assumption seems to be; some authors have analyzed the possible causes that negotiations would be made in stages and not simultaneously. For example, Ball and Cecheti (1988) indicate

[33] Parkin (1986), Akerlof and Yellen (1985) and Mankiw (1985) show that small nominal rigidities can lead to significant fluctuations in real variables.
[34] See Taylor (1979).
[35] More information on the effects of scaling can be seen in Blanchard (1983).

that staggering may occur by the desire of firms to delay pricing adjustments in order to collect the information contained in the prices of other firms. In turn, Ball and Romer (1989) suggest that companies may suffer specific shocks that are not needed to coincide in time.

Coordination failures

The work of Cooper and John (1988) and Ball and Romer (1991) show a different mechanism to explain why firms do not low their prices to cope with recessions[36]. It is known that recessions are an undesirable outcome for society and yet happen, and these economists believe this is due to coordination failures of firms.

Suppose, for simplicity, that there are two firms and that a fall in the money supply took place, with a consequent drop in the aggregate demand. If both companies lowered the price, avoiding the falling real money supply, the benefit to each is 100, if a company lowers the price and the other not, the benefit is 50 for the first, since avoiding recession requires of both to lower the price, and 75 for the second, and if the two do not lower the price the benefit to each is 50, so the recession is triggered. This shows that the resulting benefits for a given firm depend on the behavior of the other.

In this context, there are two equilibrium outcomes. If a firm believes that the other will drop its price it will also drop its price and get a profit of 100 each. If, on the contrary, the firm believes that the other firm will not lower its price it will not lower its price either; thus each one make a profit equal to 50. In

[36] This literature on coordination failures has as a framework of analysis game theory and it is associated with the existence of multiple equilibriums which can be Pareto-inferior or Pareto-superior. To see other models in this line, see Diamond (1982), Shleiffer (1986), Durlauf (1993) and Lamont (1995). There is a literature prior to this that addresses the problem of coordination with a different conceptual framework, emphasizing the dynamic imbalance, i.e. a failure to find the balance of the "invisible hand" of Smith, in which markets clear, and total usage of resources is achieved. In this sense, Clower (1965) notes that transactions are organized not only in terms of market prices, but also in response to the quantities, excess supply in a market, generating less demand for those who could not place their product, can lead to excess supply in other markets. Thus, as Leiijonhufvud (1968) noted, a fall in effective demand could be triggered, with the subsequent lack of convergence of the system to equilibrium with full employment.

other words, in the first case, we have a result where recession is avoided and, in the second case, we have a recession situation. In terms of game theory, we have a game with multiple equilibrium, an equilibrium Pareto superior equilibrium and one Pareto inferior equilibrium, respectively.

The result of recession is due to a coordination failure. That is, if firms could coordinate their actions the result would be one in which both are better, in our example, with earnings of 100. This result may not be credible with only two firms, but in the real world where thousands of firms exist, coordination failures become quite important. As a lesson in politicy-making, some of these models proposed government intervention with actions to manage these coordination failures and bring the economy to a superior equilibrium.

b. Imperfections in the labor market.

Contracts in the labor market.

One feature that is observed in the labor market is that employment contracts are, in general, in countries with low inflation rates for an extended period of time. The explanation for this is that people skills required to fill a job position in some industries are specific and, in many cases, come from the "learning by doing". Thus, companies should have a long-term relationship with their workers; otherwise, they would have to invest in training the new worker they hire.

Meanwhile, workers are pleased that this relationship exists because it gives them job stability and future income certainty, instead of the uncertainty to start looking for work. Thus, are important future job-searching costs that make individuals remain in their jobs, even if the pay is below market average. It is therefore not necessary that the wages shall be adjusted from time to time to equilibrium. This is another reason why wages have a slow adjustment process.

Baily (1974), Gordon (1974), Azariadis (1975) and Hart (1983) justify the existence of long-term contracts, in the framework of firms that are risk-neutral and risk-adverse workers. In these models fixed contracts play the

role of an incentive for workers and also as an insurance policy against future job uncertainty.

Meanwhile Fischer (1977) presents the first formal work about wage contracts in a general equilibrium model. Fischer showed that monetary expansion has effects on production, in a model in which agents have long-term contracts and rational expectations.

Efficiency wages

Another flaw in the labor market comes from the possibility that the productivity of labor is associated directly with the level of real wages. Thus, a reduction in aggregate demand will not reduce the level of real wages due to fear of entrepreneurs of causing a significant drop in the productivity of workers[37].

The theory of efficiency wages has been proposed by Solow (1979), Stiglitz (1986) and Yellen (1984) and its central tenet is that the marginal productivity of labor is not independent from real wages, in fact they are positively correlated. In this context, the profit-maximizing firm determines the real wage that can pay to get the optimal effort, this wage is called real efficiency wage and may be higher than the equilibrium one. Specifically, the real wage level settled will be at the point at which the elasticity of effort with respect to the real salary is equal to 1.

In turn, Shapiro and Stiglitz (1984), in a principal-agent model, in which the supervision of the worker conducted by the company is incomplete and costly; firms would pay higher wages so workers make their utmost effort. The higher wage would act as a mechanism to discipline the worker, by making leisure more expensive, because in case of detection he could be fired and find a job with a lower salary. Meanwhile, Arnott et. al. (1988) stresses the role of an economy with unemployment. This lack of full employment makes the agent be fear of being discovered not working and as a result being fired, so in a full employment situation the employee would not have incentives to

[37] For a more comprehensive summary of this literature, see Katz (1988) and Yellen (1984).

give their best effort; so that the mobile of the worker is not the fear of being fired, but being fired and not finding another job.

There are other reasons why keeping a relatively high salary may be interesting to businesses. A high salary generates a higher level of consumption, better nutrition and health, implies an ethical response from the worker. It is assumed that the worker is aware of the effort the firm is displaying by paying a higher wage and he decides to reward this effort with greater efficiency. Also, a high salary may cause loyalty and prevent workers from leaving the job, resulting in a benefit to the firm since the company will not have to spend more money on training new staff.

This is the reason why some industries pay above-market wages. Proponents of this theory argue that wages in some industries do not need to be adjusted to equilibrate the labor market[38]. Thus, the classical mechanism that states that in case there is unemployment, falling wages would equalize supply and demand of labor and unemployment will be only voluntary, fails. According to the theory of efficiency wages, it may not be optimal for firms to lower salary because it can lead to a significant drop in the productivity of their workers.

c. Imperfections in the credit market.

Information asymmetries and credit rationing.

Addressing the credit market analysis, where the interest rate is the variable that eliminates imbalances between supply and demand, with traditional instrumental can lead to serious errors because credit markets are very particular: future promises are traded, and not precisely goods.

This difficulty was addressed in the pioneering work of Stiglitz and Weiss (1981). In this paper, the authors present a model where, although borrowers and lenders have rational expectations, the final result is that credit demand is constantly larger than the supply, which leads to the existence of credit rationing.

[38] According to Ruff and Summers(1987), in 1914 Henry Ford paid his workers 5 dollars a day when the market was paying only 2 to 3 dollars.

In this model there is a large number of competing lenders and they have resources at a determined cost. There is also a large number of borrowers who compete by seeking credit for their investment projects. All investment projects have the same return but different risk. Each borrower knows the risk of their project, but lenders cannot know and therefore unaware of the ability to pay of potential borrowers. This is known as asymmetric information.

There is an interest rate that maximizes the expected profits of lenders. Above this rate lenders refuse to lend more money because the elevation of this leads the expected benefits to fall for two reasons: (i) discourage borrowers that are good payers, (ii) Incentive to invest in riskier projects. That is, the gain from a higher interest rate cannot be compensated because of these effects. At the edge, the lender's customers are only those with high-risk projects, ostensibly making their portfolio worse.

From a macroeconomic perspective, these imperfections have been considered for their effects on aggregate demand, resulting in a monetary channel different to the conventional one. If monetary policy alters the availability of loanable funds, investment will be affected, not by the interest rate, but by the availability of credit. In this sense, Bernanke and Blinder (1988) show that in the presence of asymmetric information, in front of changes in the money supply banks do not always respond by lowering interest rates, but via credit rationing[39].

2.7 The New Neoclassical Synthesis

Between the late nineteenth century and the early twenty-first century, a consensus between the New Classical and New Keynesian Economics began to consolidate. To this process of understanding and consensus between the two schools that had staged a hard and open confrontation particularly during the

[39] The work of Bernanke (1983), Greenwald and Stiglitz (1988), Bernanke and Gertler (1989, 1990) and Williamson (1987) analyzes the role played by credit imperfections as amplifying mechanisms of real economic shocks.

eighties, Goodfriend and King (1997) called the "New Neoclassical Synthesis", deploying the term used by Samuelson half century ago.

> "It is common that Macroeconomics is presented as a messy intellectual field, and with significant and persistent disagreements on methodology and substance between the researchers' fields of competence (...).
>
> Intellectual *corrientes* of the last ten years, however, are subject to a very different interpretation: Macroeconomics is moving toward a New Neoclassical Synthesis" (Goodfriend and King 1997, p. 231.)

This consensus would be analogous to the neoclassical synthesis promoted by Samuelson, which embodied the most important impulse produced in Macroeconomic Theory after Keynes. Chari and Kehoe (2006) are the most enthusiastic expression of the New Neoclassical Synthesis, which they call the "Modern Macroeconomics":

> "In the last three decades, macroeconomic theory and practice have changed significantly, for the better. Macroeconomics is firmly based on the principles of economic theory. These advances have not been confined to the ivory tower. In recent decades, the United States and other countries have undertaken a variety of policy changes that are precisely what macroeconomic theory of the last 30 years suggests" (Chari and Kehoe 2006, p.1) .

The "representative" model of the New Neoclassical Synthesis is the dynamic stochastic general equilibrium (DSGE) model. This type of model originated in works on real business cycles by Lucas (1975), Kydland and Prescott (1982) and Long and Plosser (1983), and to which elements of the New Keynesian Economics were incorporated. In Dickens (2011), there is a complete and updated presentation of DSGE models:

> "Modern Macroeconomics seeks to explain the aggregate economy using solid microeconomic foundations. This is in contrast to the traditional Keynesian approach to macroeconomics, which is based on

> ad hoc theorizations on macroeconomic aggregates. In modern macroeconomics, economics are portrayed as a dynamic stochastic general equilibrium (DSGE), which reflects the collective decisions of rational individuals on a range of variables concerning both the present and the future. These individual decisions are then coordinated through markets to produce macroeconomics" (Dickens 2011, p.1).

We will address the New Neoclassical Synthesis á propos of the questioning that this synthesis began to suffer as a result of the international crisis of 2008-2009.

3. OPEN ECONOMY MACROECONOMICS

The whole literature body analyzed above assumes that economies are closed, i.e. economies that do not export nor import goods and services, and do not have links with international capital markets. However, economies today are economies which have an increasing weight of foreign trade in overall GDP and they are also entrenched in international capital markets. Consequently, in the context of globalization, the abstraction of the external sector to conduct macroeconomic analysis of, for instance, Latin-American economies can have serious consequences and, therefore, we are forced to resort to the open economies macroeconomics literature.

Fortunately, the literature to address the case of these economies is ancient and vast. Arbitrarily, in order to focus on the macroeconomic approach of open economies, we can begin this literature review with the remarkable work of David Hume. Hume (1752), in his controversy with the mercantilists, introduced in a systematic and analytical way the first elements for open-economy macroeconomics highlighting the role of money and the adjustment mechanism of the imbalances in the balance of payments.

Maurice Obstfled, an important figure on open economy macroeconomics, makes a comprehensive overview of the evolution of this branch of

Macroeconomics since the post-war era to the latest developments within the so-called open economies New Macroeconomics (Obstfeld, 2001).

3.1 The pre-mundell macroeconomics

According to the mercantilist doctrine, welfare of nations could be measured by the availability of wealth, such as the availability of precious metals. Under a gold standard, the accumulation of wealth can be achieved by generating a continuous surplus of the balance of payments, through a trade surplus, which implies a net inflow of precious metals that raises the stock of wealth of a country. Thus, according to the mercantilists, to raise the wealth of nations the necessary policies that allow for a permanent surplus of the trade balance[40] should be implemented.

Hume countered the argument of price flexibility for international adjustments, as an alternative hypothesis to the ideas of the mercantilists. According to Hume, it is wrong to think that a country can have a permanent surplus in its balance of payments. Extending the quantity theory of money for the case of open economies, Hume argues that if a country has a surplus in the balance of payments, international reserves (gold) rise and consequently also the money supply increases. The rise in the money supply, as part of the quantity theory of money, raises the domestic price level for a given level of economic activity. The rise in domestic prices, assuming constant foreign prices, makes the country with surplus in its balance of payments less competitive, worsening the trade balance, which deteriorates until reserves are reduced and domestic prices reach their original level.

This mechanism can accelerate if the country initially presents a deficit in its balance of payments, a similar process begins, reducing prices and increasing domestic competitiveness. This analytical perspective outlines a vision for a world open economy with flexible prices and the consequent full employment.

[40] See in this regard Johnson (1976) and Rojas (2004). We should not be underestimated, as Keynes noted in the GT, the role of effective demand that also produces a surplus in the trade balance.

In the thirties, with the collapse of the regime of fixed exchange rates and widespread unemployment, the analytical perspective of the world turned from full employment and price flexibility to a world with sticky prices and unemployment.

> "Finding that their profits were decreasing and unemployment was increasing, each country sought to ensure, in one way or another, with tariffs, import quotes, subsidies, depreciation and counter-depreciation of the exchange rate, ##a larger portion of total reduced global activity##. Each exported, as stated in the sentence, their unemployment to the rest of the world "(Joan Robinson, 1976, p. 16).

In this context, according to Joan Robinson, "When Keynes attacked the prevailing orthodoxy, one of the things that offended my teachers the most was his attempt to rehabilitate the mercantilists, thus laying to the ground the claims of supreme benevolence and wisdom of the free traders" (Robinson, 1976, p. 13).

Thus, using the exchange rate as a tool to fight trade deficits and unemployment became a common option for policy-makers.

Devaluations, by raising demand for domestic goods vis-a-vis a decrease in demand for imported goods, can simultaneously cope with the problems of trade balance deficit and unemployment, fulfilling an old dream of the mercantilists. The importance of money on external adjustments faded into the background and attention began to focus on the elasticities of exports and imports, and in the compliance of the "Marshall-Lerner" condition.

In a context of unemployed productive factors, devaluation raises domestic demand and therefore the level of economic activity through two channels. On one hand, by reducing the price expressed in foreign currency of exported goods, export products increases its competitiveness thus giving a boost to the volume of exports. On the other hand, by making domestic price of imports more expensive, the volume of imports is reduced and demand moves towards the purchase of domestic goods. Finally, devaluation, by

raising the unit price of imported goods, could raise the total value of imports, creating a tendency to deterioration of the trade balance.

If the Marshall-Lerner condition is met, devaluation should improve the trade balance and as a result increase aggregate demand and the level of economic activity and employment, only if there was slack in the usage of productive factors.

However, immediately following the Second World War, when major economies were operating with economic activity levels close to full employment, the reactivating effect of devaluation began to be questioned and the "Elasticities Approach" was replaced by "Absorption Approach" postulated by S. Alexander. Under this approach, if there is full employment, the favorable effect of devaluation does not lie in the argument of elasticities but in the fact that devaluation, by raising the domestic price level, reduces domestic absorption in relation to productive capacity and thus improves the trade balance.

According to Alexander (1971), in a world with full employment, devaluation will affect the trade balance because it modifies the production of goods and services or by modifying the amount of real absorption.

Nonetheless, with the remarkable work of Meade (1951), *The Balance of Payments*, where it can be said that it presented for the first time in a systematic way the problems and policy options of open economy macroeconomics, achieving the reconciliation between the absorption approach and the elasticity approach, among other objectives. In this perspective, in a world with full employment, devaluation cannot be the unique instrument to correct balance of payments deficits. Devaluation should be used to change the composition of demand ("expenditure-switching"), but also should be used to achieve deflation in order to balance aggregate demand with aggregate supply ("expenditure-reducing").

According to Dornbusch (1980), Meade's work is an extraordinary example of the usefulness of the discussion of the typical issues of an open economy, from tariffs to capital controls, with a great deal of formal macroeconomics.

Meade's work also made an important contribution choosing the right policies at every moment in the context of open economy macroeconomics, and the concepts of internal and external equilibrium were used to identify the potential of the various policies and the possibility of resolving the dilemmas that arose around their choice. "Meade's theory pointed toward macroeconomics distancing from partial equilibrium and informal analysis. The change of emphasis included modeling and recognition of the existence of budget constraints, identities, balance and interdependent equilibrium conditions, all in the aggregate, in short, everything that we take for granted today. Meade is the first example of this new trend, but undoubtedly the work of Trevor Swan and Harry Johnson should also be mentioned, as both contributed significantly to the integration of open economy macroeconomics with a closed economy" (Dornbusch, 1980, p. 4).

Furthermore, in the discussion of the advantages and disadvantages of exchange rate regimes, Milton Friedman (1971) presents a set of arguments for favoring a regime of flexible exchange rates. When choosing between a fixed exchange rate and one comprising mini-devaluations, Friedman leans for the former.

According to Friedman, when the exchange rate is flexible, "the exchange rate is… potentially an extremely sensitive price. Changes affect it quickly, automatically and continuously, tending to produce corrective movements before tensions accumulate producing a crisis"(p. 448).

> "The system of sporadic changes in a temporarily rigid exchange rate seems the worst thing in the world to me: it does not provides stability in expectations, something that a genuine rigid exchange rate could provide in a world of unrestricted trade and with will and ability to adjust the internal price structure to external conditions, nor does provide the continued sensitivity of a flexible exchange rate (...). If internal prices were as flexible as exchange rates, there would be little difference, from an economic standpoint, between the settings generated by changes in exchange rates and those originated in equivalent variations in domestic prices. But this condition, of course, is

not met. The exchange rate is potentially flexible in the absence of administrative actions that freeze it. At least in the modern world, internal prices are little flexible; its upward flexibility is greater than the downward one, but still on the rise, it is not the same for all prices. In some sectors the adjustment mainly takes the form of changes in prices, in others, changes in output "(Friedman 1971, p. 449 and 450).

3.2 Mundell's Macroeconomics

In the context of international integration of capital markets and the choice between adopting a system of fixed exchange rate or a floating one[41], two papers which revolutionized macroeconomics of open economies appeared: Mundell (1963) and Fleming (1962). In these works, the IS-LM model for a closed economy developed by Hicks is extended to the context of an open economy, incorporating the trade balance as part of aggregate demand and allowing the existence of free mobility of financial capital flows.

We will focus on the work of Mundell (1963), Nobel Prize in Economics in 1999, which provides an excellent framework for macroeconomic analysis of open economies. In this field, the main assumptions of his work are:

- There is perfect mobility of capital, which implies that domestic and foreign financial assets are perfect substitutes for each other.
- The current exchange rates and the future ones are identical, i.e. the expected devaluation is zero[42].
- There are idle resources, constant returns to scale and fixed monetary wages. That is, prices are given, as in Hicks, and therefore aggregate supply is perfectly elastic. This supposition allows us to "ignore" aggregate supply.
- The economy is small in the sense that it cannot affect the interest rate or foreign output.

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41 In the sixties, most countries had fixed exchange or controlled under the Bretton Woods agreement systems. Later systems became floating or free exchange rate.

42 This assumption is controversial, as we shall see later.

- The trade balance depends only on income and the exchange rate.

The system of equations presented below reflects the original model of Mundell. In the first equation, output (Y) is determined by demand, and this one, by consumption (C), investment (I), public spending (G) and the trade balance ($X - eM$). In the second equation, the equilibrium in the money market, the nominal money supply (H^s), composed of international reserves (B^{*bcr}) and the stock of government bonds (B^b), is equal to the demand for money (Ph^d). Finally, the third equation shows that the performance of domestic assets, the interest rate(r), is identical to the external assets(r^*), in the absence of expected devaluation.

$$Y = C(Y) + I(r) + G + X(e) - eM(e,Y) \quad (1.6)$$

$$H^s = B^{*bcr} + B^b = Ph^d(Y,r) \quad (1.7)$$

$$r = r^* \quad (1.8)$$

Where:

E : *Nominal exchange rate.*

P : *Domestic price level.*

$e = E/P$: *Real exchange rate.*

h^d : *Real money demand.*

If these equations accurately reflect the essence of Mundell's model, under a fixed exchange rate, output (Y) is determined in equation (1.7), the goods market equilibrium; net international reserves of the central bank (B^{*bcr}) are determined in equation (1.8), the equilibrium of the money market; and the domestic interest rate (r) in equation (1.9), the equation of interest rate arbitrage, which reflects the free movement of capital flows.

On the other hand, if the scheme is of a flexible exchange rate one, the exchange rate should be determined in the goods market, output in the

money market and interest rates would continue to be determined in the arbitrage equation[43].

Mundell's presentation assumes that the expected exchange rate does not differ from the effective exchange rate so that, in a way it is a long-term model, while assuming that prices are fixed, makes the model a short-term one. For the model to be effectively one of short term, the expected exchange rate and the actual exchange rate should be different, so that there may be expectations of devaluation (or revaluation) of the exchange rate. Thus, in equation (1.3), to match the performance of domestic assets, which are denominated in local currency, with external assets, which are denominated in foreign currency, we introduce the expectations of change in the exchange rate. This, as will be seen later, has important implications in determining the potency of fiscal policy and monetary policy.

$$Y = C(Y) + I(r) + G + X(e) - eM(e,Y) \tag{1.7}$$

$$H^s = B^{*bcr} + B^b = Ph^d(Y,r) \tag{1.8}$$

$$r = r^* + \frac{E^e - E}{E} \tag{1.9}$$

Where:

$\frac{E^e - E}{E}$: *Expected devaluation rate.*

E^e : *Expected exchange rate.*

In this presentation, markets where output, reserves and interest rates are determined are the same under a fixed exchange rate. However, under a flexible exchange rate, the allocation made in the Mundell model is modified. As seen in this system of equations, output is determined in the goods

[43] Given the system of equations presented, where the exchange rate is not present in the money market nor in the arbitrage equation, the exchange rate must necessarily be determined in the goods market.

market, the interest rate on the money market and the exchange rate in the arbitrage equation.

What are the effects of monetary policy or fiscal policy on interest rates, the level of economic activity and international reserves (or the exchange rate under a flexible exchange rate)? What are the transmission channels through which fiscal policy and monetary policy act? Is fiscal policy more or less effective than monetary policy? These are the main questions, fully contemporary, which Mundell tried to answer.

In a world operating with fixed exchange rate, according to Mundell, an expansionary monetary policy exerts a downward pressure on the interest rate that is prevented by capital flight, worsening the balance of payments. To prevent a decrease in the exchange rate, the central bank intervenes in the market, selling dollars and buying domestic currency, until the accumulated deficit of foreign currency equals the open market purchase, and the money supply is restored to its original level. Therefore, monetary policy does not affect the interest rate or the level of economic activity. In the words of Mundell (1963):

> "This shows that monetary policy under fixed exchange rates, has nule effects on the level of income" (Mundell, 1963, p. 534).

On the other hand, under a fixed exchange rate, when government spending rises, demand always rises and consequently the level of activity does. Increased income will boost demand for money, which produces an upward pressure on interest rates, attracting foreign capital which, in turn, generates a temporary improvement in the balance of payments that forces the central bank to intervene by buying foreign currency. Foreign reserves are accumulated for the total amount of increased reserves that the banking system needs to meet the increased demand for money from the public, due to increased income.

Under a flexible exchange rate, according to Mundell, an expansionary monetary policy (open market purchases of domestic securities) increases the money supply and pressure interest rates downward. However, this pressure

does not result in a reduction of the interest rate because it is produced a devaluation that improves the trade balance, raise the level of economic activity, which increases the demand for money to equilibrate the supply of money created. "Monetary policy, therefore, has a strong effect on the level of income and employment, not because it alters the rate of interest, but because it leads to a capital outflow, and therefore the exchange rate depreciates, causing a trade balance surplus "(Mundell, 1963, p. 532).

Still within the world with a flexible exchange rate, if government spending increases, according to Mundell, the biggest expense generates excess demand, and accordingly, income rises. But this increase in income would raise the demand for money, raising interest rates, boosting capital inflows and revaluating the exchange rate, which, in turn, would diminish income.

> "(...) In fact, therefore, the negative effect on income that has the currency revaluation must exactly offset the positive multiplier effect on income of the initial increase in government spending. Income cannot change unless you change the money supply or interest rates, and since the former is constant when there is no central bank intervention and the second is set by the global interest rates, the income remains fixed (....) Fiscal policy completely lost, thus, its strength as internal stabilizer, allowing the exchange rate to fluctuate and that the money supply remains constant "(Mundell, 1963, p. 533).

In short, according to Mundell, "monetary policy has no effect on output under fixed exchange rates, while fiscal policy does not have them under flexible exchange rates. Moreover, fiscal policy has a greater effect on output with fixed exchange rates (Keynes' conclusions are met), while monetary policy has a great effect on output with flexible exchange rates (the conclusions of the classical quantity theory are met)" (Mundell, 1963, p. 541).

With the introduction of the expected devaluation (equation 1.10), the results and the transmission channels are different from those described by Mundell, particularly in the regime of flexible exchange rates.

In the case of expansive monetary policy, using the system of equations where devaluation expectations are introduced, we can see that the increase in the money supply creates an excess supply in the money market, which reduces the domestic interest rate. The reduction in the interest rate raises investment and therefore the level of economic activity and, at the same time produces a capital outflow that raises the exchange rate, which contributes to raising the level of economic activity. That is, the power of monetary policy may be greater than that presented by Mundell, since, besides the increase in the exchange rate, which favorably affects the trade balance, interest rates decline, which increases private investment.

In the case of expansionary public spending, along with the case of a system of flexible exchange rates, rising demand in the goods market reactivates the level of economic activity. The increase in output raises domestic interest rates, and this increase causes an appreciation of the exchange rate, weakening, but not eliminating, the reactivating effect of increased government spending. That is, unlike Mundell's model, public spending may have an expansionary effect in the short term.

Beyond this remarkable contribution to macroeconomics of open economies, Mundell also raised the idea of the optimal policy mix to achieve external balance (balance of payments in equilibrium) and internal balance (full employment). Mundell (1963) showed that under free capital mobility and fixed exchange rate, monetary policy should focus on external balance, while fiscal policy must pursue the objective of full employment. For example, if a country experiences simultaneously balance of payments deficit and unemployment, it should expand public spending and implement a contractionary monetary policy. With free capital mobility and fixed exchange rates, the policy mix should assign fiscal policy the objective of internal balance and monetary policy the target of external balance.

3.3 Monetary approach of the balance of payments

In the fifties and sixties, the Research Department of the International Monetary Fund (IMF) and the University Of Chicago Department Of

Economics, with Jacques Polak, Harry Johnson and Robert Mundell, developed a particular way of analyzing the balance of payments, called the monetary approach to the balance of payments (MABP)[44]. In essence, this approach, applicable to economies with fixed exchange rates, states that the variation of net international reserves of the central banks may be interpreted as a reflection of the imbalance in the money market. In essence, it is an extension of the analysis of Hume with the difference that it emphasizes the effects of monetary imbalances in relative prices and competitiveness, while MABP emphasizes income and expenses, and the in balance of payments as a whole, not only in the trade balance.

For example, when the monetary authority applies an expansionary monetary policy, there is excess money supply. Under certain conditions (level of activity in its full employment level, small open economy in the markets for goods and financial markets, compliance with the law of one price and validity of a system of fixed exchange rates), this imbalance manifests itself in an excess demand in the goods market that adjusts itself through higher imports, lower exports and therefore a loss of international reserves.

From this perspective, the problems of the balance of payments are the direct result of imbalances in the money market and, consequently, enough healing can come from monetary policy:

> "The main features of the monetary approach of the balance of payments can be summarized in the statement that the balance of payments is essentially a monetary phenomenon" (Own translation, Frenkel and Johnson 1976, p. 21).

Polak (1957), who worked at the IMF for 33 years, was a pioneer in incorporating the MABP in this institution, by integrating monetary and credit factors in the analysis of the balance of payments and deriving a formal relationship between policy measures and results on the balance of payments. In Polack's analysis, the endogeneity of the money supply in an open economy with fixed exchange rate is stressed, and the transmission

[44] See Frenkel and Johnson (1976).

mechanism between money supply and national income through the interest rate is eliminated, and replaced by the credit channel.

To illustrate the Polak model, consider that there is a temporary expansion in the volume of domestic credit. This rise in credit increases money supply, and according to the quantity theory of money, nominal income rises. The expansion in nominal income increases imports, and given the level of exports and capital flows, the balance of payments worsens, international reserves fall, therefore dampening the money supply. In the long run, the result is a loss of international reserves equivalent to the increase in domestic credit. This one-to-one relationship between the change in domestic credit and international reserves is, of course, the fundamental equation of the monetary approach to the balance of payments. Polak's contribution was to also have a short-term solution and the explanation of the transmission channels through which domestic credit affects the balance of payments.

The Polak model then provides analytical justification (under a regime of fixed exchange rate) for the use of credit ceilings by the IMF. Monitoring domestic credit expansion, one can determine if the program is in the "right direction" to achieve the goal level of net international reserves.

After almost 50 years since the publication of its documents, virtually all adjustment programs supported by the IMF still exploit the link between domestic credit and the balance of payments made by Polak and even today credit ceilings are used as a criterion performance of the programs sponsored by the IMF[45].

3.4 The "overshooting" and macroeconomics of open economies of Rudiger Dornbusch

In the early '60s, macroeconomics was already established as a valid approach to approximate an open economy.

In the '70s, the existence of floating exchange rates suddenly rekindled the interest in economic modeling, old ideas were placed in new clothes and some

[45] See Polak (1995).

new concepts were developed. Tobin (1969) offers an impressive contribution to macroeconomics of open economies with a macroeconomic model whose real sector is similar to that of Mundell-Fleming, but with a more diversified portfolio of assets. Furthermore, following the work of Black (1973), rational expectations were soon introduced into macroeconomics of open economies.

Finally, the rational expectations hypothesis and the hypothesis of different speeds of adjustment climaxed with Dornbusch (1976), who presents a model that incorporates the dynamics of the exchange rate and prices, and gives rise to the "overshooting "of the exchange rate.

Dornbusch, Mundell's student in Chicago, contributed decisively in enriching and disseminating the analytical framework of Mundell and Fleming. Three years after the breakdown of the fixed exchange rate system of Bretton Woods, the work of Dornbusch is the first systematic attempt to explain why the exchange rate fluctuates sharply after being left to float.

The Dornbusch analysis framework, whose main innovation is to assume that asset markets adjust faster than the goods market, has the following characteristics:

- Small and open country, which means that foreign prices and interest rates are given.
- The money market is always in equilibrium.
- The uncovered interest parity is met, i.e. the differential of nominal interest rates of domestic and foreign assets is equal to the expected rate of depreciation (or appreciation) of the domestic currency[46].
- The adjustment of prices in the goods market is slow and inflation is determined according to the Phillips curve.
- The purchasing power parity holds in the long term, not the short term.
- The exchange rate regime is one of a flexible exchange rate.

$$Y^d = \beta_0 + \beta_1(e - p)\beta_3 r \qquad (1.10)$$

[46] Domestic and foreign assets are perfect substitutes.

$$m - p = \psi \bar{y} - \sigma r \tag{1.11}$$

$$r = r^* + \overset{\circ}{e}^e \tag{1.12}$$

$$\overset{\circ}{e}^e = v(\bar{e} - e) \tag{1.13}$$

$$\overset{\circ}{p} = q(y^d - \bar{y}) \tag{1.14}$$

Equation (1.10) describes the demand for goods (y^d), which directly depends on an exogenous component that embodies fiscal spending or exports (β_0), and also directly on the real exchange rate ($e - p$) and inversely with respect to the interest rate(r).

In equation (1.11), which represents the equilibrium in the money market, the real money supply ($m - p$) equals demand, which depends on output (full employment, $\bar{y}$) and the interest rate.

Equation (1.12) describes the uncovered parity of interest rates, according to which the domestic interest rate equals the foreign interest rate (r^*) adjusted for expected depreciation ($\overset{\circ}{e}^e$). Equation (1.13) defines the expected depreciation rate as the difference between the long term expected exchange rate ($\bar{e}$) and the effective exchange rate (e).

Finally, equation (1.14) represents the Phillips curve, whereby inflation ($\overset{\circ}{p}$) directly responds to excess demand in the goods market ($y^d - \bar{y}$).

Suppose that in this economy, there is an unanticipated rise the amount of money (m). In the money market, equation (1.12), as prices are sticky in the short run, the real money supply of money ($m - p$) rises above the demand for money, causing a reduction in the domestic interest rate (r). The reduction in domestic interest rate increases the relative attractiveness of foreign currency assets, increasing their demand and raising, therefore, the effective exchange rate (e) in equations (1.12) and (1.13). Those are the

immediate effects on asset markets. The exchange rate fluctuates above and the rate of interest below their respective long-term levels: *overshooting* of the exchange rate and *undershoting* of the domestic interest rate.

Subsequently, transmission mechanisms acting on the demand for goods and the inflation rate activate, equations (1.10) and (1.14). In the goods market, the reduction in domestic interest rates and the rising real exchange rate raise the demand for goods, which is placed above the potential output, and, through the mechanism involved in the Phillips curve, raises the price level. The rise in the price level, in turn, exerts downward pressure on real money supply, raising domestic interest rates and reduces exchange rate, starting adjustments that, in the new steady state, they mean elevation of the exchange rate, but at a lower level than the period of impact.

In short, in front of an exogenous shock, such as the one producing a rise in the money supply, the exchange rate will "jump" in the short term over its long-term level.

Another key contribution of Rudiger Dornbusch was to deliver a text that incorporated the stock of accumulated knowledge about the macroeconomics of open economies until the late seventies, a task in which he had been a major player: the Open Economy Macroeconomics (1980).

This book has three major sections. The first section thoroughly presents the integration of an economy to the world through trade along with the theory of income determination in line with the development of the foreign trade multiplier, and the integration of relative prices to income determination. Relative prices, tariffs, export subsidies -whose modeling had been anchored in partial equilibrium models- are presented in an original way.

Subsequently, money and the determination of exchange rates in the context of international monetary economics are introduced, enriching the Mundell-Fleming and the overshooting model. Finally, in the Tobin's tradition, in the latter part of the book, assets different from cash are introduced in the analysis, connecting the asset markets with the analysis of the current account of the balance of payments.

3.5 The models of balance of payments crises

The models outlined with fixed exchange rate assume that participants in foreign exchange markets expect that the exchange rate set by the monetary authority will remain at its current level indefinitely. However, under certain conditions such as a very expansionary monetary policy, a sharp increase of foreign interest rates or a sudden deterioration in the current account of the balance of payments might be perceived by the public as a sign that the monetary authority does not have the resources to maintain the fixed exchange rate and, consequently, public expectations point towards an imminent change in the exchange rate that can lead to a balance of payments crisis, i.e. a rapid reduction of international reserves of the monetary authority.

Literature on balance of payments crisis is vast and was born with "first generation" models[47], or "canonical crises models", in the terminology of Krugman (1998), where it is assumed the existence of purchasing power parity, uncovered interest arbitrage and perfect foresight. Literature on balance of payments crisis based on "first generation" models emphasizes poor domestic macroeconomic policy as a determinant of the balance of payments crisis. With a fixed exchange rate and free capital mobility, an expansionary monetary policy necessarily leads to a balance of payments crisis.

These models allow us to calculate first, how long it takes for international reserves to be depleted in the absence of speculation; that is, when the public expects the exchange rate will remain fixed. Then, we can calculate the time in which international reserves will be depleted in the presence of speculation, that is, when the public expects a collapse of the exchange rate. In these presentations, crises occur by internal factors, because the central bank maintains an expansive monetary policy, by maintaining a constant rate of credit expansion.

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[47] See Esquivel and Larrain (1998), and Flood and Garber (1994).

Using the equations representing the equilibrium in the money market and the arbitrage equation from the Mundell-Fleming model, assuming that output is at its potential level, as in the MABP, we can anticipate the intuition of a crisis in the balance payments.

$$H^s = B^{*bcr} + B^b = Ph^d(Y, r) \tag{1.8}$$

$$r = r^* + \frac{E^e - E}{E} \tag{1.9}$$

Imagine an expansionary monetary policy in this model, supposing that the exchange rate is fixed. Further bond buying by the central bank (a rise of B^b in the money market), since neither the interest rate nor production have changed, implies a fall in international reserves (B^{*bcr}). If the level of international reserves fell to a level considered critical by the participants in the foreign exchange market, the exchange rate expected by the public, E^e, could rise, and whit that the external asset profitability, adjusted for the higher rate of expected devaluation, $r = r^* + \frac{E^e - E}{E}$, is put above the rate of return on domestic assets, r. Consequently, the domestic interest rate should rise, thus the demand for real balances is reduced, amplifying the excess supply in the money market and exacerbating the fall in the international reserves of the central bank.

As the stock of international reserves of the central bank may have declined even more, the loss of confidence in the central bank to maintain the fixed exchange rate can be heightened, and the speculative attack may be repeated until the central bank finally decides to let the exchange rate float, as occurred in multiple episodes of balance of payments crises.

3.6 The New Macroeconomics for Open Economies

In the early nineties of the last century, the New Neoclassical Synthesis achieved in the field of closed economies began to pierce into the field of open economies. This development was called the New Open Economy Macroeconomics.

Lane's article (2001) made a comprehensive review of the literature of the New Open Economy Macroeconomics. The unifying feature of this literature, which is in line with the New Neoclassical Synthesis of closed economies, is the introduction of nominal rigidities and market imperfections in a general equilibrium framework with well-specified microfoundations.

Imperfect competition, either in the goods market or the factors market, allows us to introduce monopolistic power to price fixing. As prices are above marginal costs, output can be determined by demand in the short term because companies can maximize their profits by producing more. In addition, as equilibrium with monopolistic power implies an output level lower than the optimal one, there is room for policy intervention. Additionally, the presence of utility functions and profit maximization problems allow us to make explicit welfare analysis. Finally, nominal rigidities and market imperfections alter the transmission mechanisms of shocks and provide a more powerful role for monetary policy.

This development, according to Lane, would be far superior to that offered by traditional models of the Mundell-Fleming type. Thus, also in this field of macroeconomics, a sort of New Neoclassical Synthesis of open economies is being reached:

> "(...) The research program described is closely linked to the evolution of the Macroeconomics of closed economies. There is a sensation that macroeconomists are converging on a common modeling framework that integrates imperfect competition and nominal rigidities within dynamic general equilibrium models. This recent development has been called "Neomonetarism" by Kimball (1995) and the "New Neoclassical Synthesis" by Goodfriend and King (1997). "(Lane 1999, p.2)

A pioneering contribution in this field was that of Svensson and van Wijnbergen (1989), who proposed intertemporal treatment with microeconomic foundations and price rigidities in the field of open economies, both of which have been adopted by later literature.

But it was the article of Obstfeld and Rogoff (1994) which led to the outbreak of publications of the New Open Economy Macroeconomics. This paper extends the absorption view recognizing that savings and investment decisions, and sometimes decisions made by government, are the result of a forward-looking calculus based on expectations about productivity growth, demand for government spending, real interest rates, etc. Consequently, the current account of the balance of payments would be a result of the decisions of economic agents. This overview summarizes the views of absorption and elasticities, also taking into account the macroeconomic determinants of relative prices and analyzing the impact of current and future prices on savings and investment.

These developments, as also noted by Lane (2001), went hand in hand with the ones that Robert Lucas had introduced in the field for closed economies:

> "As usual, this new focus in open-economy macroeconomics resulted both from theoretical advances in other parts of economics and from economic events that existing open-economy models seemed ill equipped to examine.
>
> Lucas's (1976) influential critique of econometric policy evaluation was one important theoretical motivation for an intertemporal approach. His insistence on grounding policy analysis in the actual forward-looking decision rules of economic agents suggested that open-economy models might yield more reliable policy conclusions if demand and supply functions were derived from the optimization problems of households and firms rather than specified to match reduced-form estimates based on ad hoc econometric specifications" (Obstfeld and Rogoff 1994, p. 4).

Contemporary literature on the macroeconomics of open economies, intertemporal and with solid microeconomic foundations has been consolidated in the book of Obstfled and Rogoff (1996), which has already become a classic. One of the basic objectives of the book is to present the role of international asset markets in allowing consumption and investment

over time, covering excess supply or demand for loans: it is the inter-temporal view of the deficit in the current account of the balance of payments.

The first 7 chapters of the book are devoted to the real sector of the open economy and it is only in Chapter 8 where money is introduced. Chapter 9 presents a very rigorous development of Mundell, Fleming and Dornbusch's models, in one of the few chapters that present models without microeconomic foundations[48]. The starting point of this chapter is the proof that it is rigidity of goods prices which can lead to an overshooting of the exchange rate, from the global stylized fact that exchange rate volatility is higher than the one of domestic prices. The shortcomings of this model, expressed in Chapter 10, are the lack of microfoundations for intertemporal decisions, so that the model has little to say about the current account or the fiscal deficit.

This was the state of the Macroeconomics of closed and open economies, before the outbreak of the global crisis of 2007-2009.

4. THE MACROECONOMICS OF THE XXI CENTURY: ISSUES AND PROSPECTS

4.1 State of Macroeconomic Theory in the early XXI century

Early in the first decade of the century, it seemed that a consensus had been reached in the field of macroeconomic theory. The academic environment looked similar to that observed during the neoclassical synthesis, in the "Golden Age of Macroeconomics", a term coined by Blanchard (2010) to refer to the period from the early forties and early seventies of the last century.

The intellectual struggle in the United States among macroeconomists from the "Saltwater" School (universities of the coast of the United States) —where the New Keynesians were seated— and macroeconomists from the "freshwater" School (universities located close to the Great Rivers of the US) —which were headed by the New Classics— seemed to have dimmed and

[48] See also, for this topic, Obstfeld (2001).

consensus were greater than differences. According to Goodfriend and King (1997), a New Neoclassical Synthesis had emerged.

Robert Lucas Jr., 1995 Nobel Laureate in Economics, proclaimed his optimism in 2003:

> "Macroeconomics was born as a distinct field in the 1940s, as a part of the intellectual response to the Great Depression. The term then referred to the body of knowledge and expertise that we hoped would prevent the recurrence of that economic disaster. My thesis in this lecture is that macroeconomics in this original sense has succeeded: Its central problem of depression-prevention has been solved, for all practical purposes, and has in fact been solved for many decades. There remain important gains in welfare from better fiscal policies, but I argue that these are gains from providing people with better incentives to work and to save, not from better fine tuning of spending flows". (Lucas 2003, p.1)

Olivier Blanchard (2008) believed too, that Macroeconomics was following an encouraging path. In his opinion:

> "For a long while after the explosion of macroeconomics in the 1970s, the field looked like a battlefield. Over time however, largely because facts do not go away, a largely shared vision both of fluctuations and of methodology has emerged. Not everything is fine. Like all revolutions, this one has come with the destruction of some knowledge, and suffers from extremism and herding. None of this deadly however. The state of macro is good."(Blanchard 2008, p.1)

At first, Blanchard describes that the relationship among saltwater economists and freshwater was tense and often unpleasant. The latter accused the former of being bad economists, who used outdated and discredited theories. And the latter were accused of building irrelevant models that used to ignore the facts.

But in the end the facts made some theories become irrelevant. The new techniques developed by New Classics started to be dominant and commonly

used, and the facts emphasized by the New Keynesians forced economists to introduce market imperfections in models. According to Blanchard, a common macroeconomic view had emerged.

The structure of the new articles on Macroeconomics published in the most prestigious journals in the world looks very similar, regardless of whether they are written by the New Classics or New Keynesians, and is very different from four decades ago. Examples of this extraordinary convergence, according to Blanchard, are the dynamic and stochastic general equilibrium models (DSGE). The DSGE model is the most representative face of the New Neoclassical Synthesis.

These models are microfundated, workers-consumers maximize a utility function, firms maximize profits, all agents have rational expectations and some imperfection in markets are introduced (for instance, some nominal rigidity). These models seek to explain economic phenomena as diverse as economic growth, business cycles and the effects of monetary policy and fiscal policy. As these models are derived from microeconomic principles, unlike more traditional econometric forecasting models, are invulnerable to the "Lucas critique". As the microfoundations are based on the preferences of the relevant economic agents, this device is also used to evaluate the effects of policies on welfare. These models, finally, cover the likes of the two schools of macroeconomists.

A great actor of this convergence, Woodford (2009), fully shares the view of Blanchard (2008).

> “While macroeconomics is often thought of as a deeply divided field, with less of a shared core and correspondingly less cumulative progress than in other areas of economics, in fact, there are fewer fundamental disagreements among macroeconomists now than in the past decades. This is due to important progress in resolving seemingly intractable debates (...) I believe that there has been a considerable convergence of opinion among macroeconomists over the past 10 or 15 years. While the problems of the field have not all been resolved, there are no longer

> such fundamental disagreements among leading macroeconomists about what kind of questions one might reasonably seek to answer, or what kinds of theoretical analyses or empirical studies should be admitted as contributions to knowledge." (Woodford 2009, pp. 1 y 2).

The New Neoclassical Synthesis was brewing. Woodford's book (2003), as Mankiw (2006), is an important example that this synthesis was being achieved:

> "Like the neoclassical-Keynesian synthesis of an earlier generation, the new synthesis attempts to merge the strengths of the competing approaches that preceded it. From the new classical models, it takes the tools of dynamic stochastic general equilibrium theory. Preferences, constraints, and optimization are the starting point, and the analysis builds up from these microeconomic foundations. From the new Keynesian models, it takes nominal rigidities and uses them to explain why monetary policy has real effects in the short run. The most common approach is to assume monopolistically competitive firms that change prices only intermittently, resulting in price dynamics sometimes called the new Keynesian Phillips curve. The heart of the synthesis is the view that the economy is a dynamic general equilibrium system that deviates from a Pareto optimum because of sticky prices (and perhaps a variety of other market imperfections). (Mankiw 2006, p. 15).

In summary, the key elements of this convergence, this New Neoclassical Synthesis, would be, according to Woodford (2009):

i) The models are built with foundations consistent with intertemporal general equilibrium.

ii) The policy analysis is necessarily quantitative.

iii) Expectations are endogenous in order to capture changes that occur in economic policy.

iv) Real shocks are considered as an important source of economic fluctuations.

v) Monetary policy is effective, especially for inflation control.

In this context, Lucas (2003) insisted that it was not worth investing much time in the study of business cycles, including efforts to seek sophisticated countercyclical fiscal policy rules or monetary policy rules in order to mitigate these cycles, and that effort should be devoted to understanding the mechanisms of economic growth.

However, early on, Mankiw (1990) had warned that these important theoretical advances had almost no influence on the design of macroeconomic policy, which was guided by the traditional tools of the neoclassical synthesis. In Mankiw (2006) this position is confirmed.

> "The sad truth is that the macroeconomic research of the past three decades has had only minor impact on the practical analysis of monetary or fiscal policy. The explanation is not that economists in the policy arena are ignorant of recent developments. Quite the contrary: The staff of the Federal Reserve includes some of the best young Ph.D.'s, and the Council of Economic Advisers under both Democratic and Republican administrations draws talent from the nation's top research universities. The fact that modern macroeconomic research is not widely used in practical policymaking is prima facie evidence that it is of little use for this purpose. The research may have been successful as a matter of science, but it has not contributed significantly to macroeconomic engineering. (Mankiw 2006, p. 19).

The influence has not reached yet the field of macroeconomics taught in universities around the world.

> "A generation ago, the three leading texts for this course were those by Robert Gordon, Robert Hall and John Taylor, and Rudiger Dornbusch and Stanley Fischer. Today, the top three sellers are those written by Olivier Blanchard, Andrew Abel and Ben Bernanke, and myself. The common thread is that each of these six books was written by at least one economist with graduate training from MIT, a prominent engineering school where the dominant macroeconomic traditions were

> that of Samuelson and Solow. In all these books, the basic theory taught to undergraduates is some version of aggregate demand and aggregate supply, and the basic theory of aggregate demand is the IS-LM model. (…)This lack of revolution in macroeconomic pedagogy stands in stark contrast to what occurred half a century ago. When the Samuelson text was first published in 1948 with the aim of introducing undergraduates to the Keynesian revolution, the world's teachers rapidly and heartily embraced the new approach. By contrast, the ideas of new classicals and new Keynesians have not fundamentally changed how undergraduate macroeconomics is taught" (Mankiw 2006, pp. 20 y 21).

Finally:

> "The leading developments in academic macroeconomics of the past several decades bear little resemblance to dentistry. New classical and new Keynesian research has had little impact on practical macroeconomists who are charged with the messy task of conducting actual monetary and fiscal policy. It has also had little impact on what teachers tell future voters about macroeconomic policy when they enter the undergraduate classroom. From the standpoint of macroeconomic engineering, the work of the past several decades looks like an unfortunate wrong turn." (Mankiw 2006, p. 22).

Likewise, to Robert Solow, 1987 Nobel Prize, Modern Macroeconomics or New Neoclassical Synthesis fail to convince him. On the Chari and Kehoe phrase quoted above, Solow (2008) has an entirely opposite position:

> "The first sentence of the article by V. V. Chari and Patrick Kehoe in the Fall 2006 reads: "Over the last three decades, macroeconomic theory and the practice of macroeconomics by economists have changed—for the better." I think that the last phrase is a little too self-congratulatory, and the last three decades have produced rather a mixed bag. But that is ultimately a matter of opinion. The second sentence then reads: "Macroeconomics is now firmly grounded in the

> principles of economic theory." I think this sentence is simply false, but this time as a matter of fact, not opinion. If I am right about the second sentence, the case for the first sentence partly evaporates" (Solow 2008, p. 243).

Finally, DSGE models also have important detractors who burst before the international crisis of 2008-2009 appeared. For example, Howitt, Kirman, Leijonhufvud, Mehrling and Colander (2008) state:

> "It is time for the science of macro to step beyond representative agent, DSGE models and focus more on alternative heterogeneous agent macro models that take agent interaction, complexity, coordination problems and endogenous learning seriously (…)what makes macroeconomics a separate field of study is the complex properties of aggregate behavior that emerge from the interaction among agents. Since in a complex system aggregate behavior cannot be deduced from an analysis of individuals alone, representative agent models fail to address the most basic questions of macroeconomics. *Any meaningful model of the macro economy must analyze not only the characteristics of the individuals but also the structure of their interactions.* Such a view is commonplace in other disciplines from biology to physics and sociology. They recognize that the aggregate behavior of systems of particles, molecules, neurons, and social insects cannot be deduced from the characteristics of a "representative" of the population. The same is true for economic systems; the fallacy of composition exists, and must be dealt with" (Howitt, Kirman, Leijonhufvud, Mehrling y Colander, pp. 1 y 2).

Robert Solow is not convinced of DSGE models either, and rather sympathizes with narrower models:

> "I have no objection to the assumption, at least as a firs approximation, that individual agents optimize as best they can. That does not imply—or even suggest—that the whole economy acts like a single optimizer under the simplest possible constraints. So in what sense is this

> "dynamic stochastic general equilibrium" model firmly grounded in the principles of economic theory? (..)
>
> My general preference is for small, transparent, tailored models, often partial equilibrium, usually aimed at understanding some little piece of the macroeconomic mechanism." (Solow 2008, pp. 244 y 246)

4.2 The global crisis and its impacts on Macroeconomic Theory and Policy

But it was the international crisis of 2008-2009, with its epicenter in the United States, and the most recent 2011-2012 crisis whose focus was on the Eurozone, which have exacerbated disagreements among macroeconomists, both on the theoretical ground, as on the macroeconomic policy one.

An important group of macroeconomists, such as the 2008 Nobel Prize Paul Krugman, Willem Buiter, Bradford De Long, Alan Blinder, Richard Koo and Paul De Grauwe, among others, believe that there has been no development in macroeconomic theory last three decades and that there is the need to return to traditional Keynesianism if they want the Macroeconomics to be a useful device to understand the current international macroeconomic environment. Caballero (2010), Solow (2008) and Howitt, Kirman, Leijonhufvud, Mehrling and Colander (2008) are in an intermediate position and their demands point to a development of Macroeconomics that takes as a starting point the "mainstream" development (The New Neoclassical Synthesis) and that incorporates the essential problems of the contemporary world.

The phrase of De Grauwe (2012b) clearly reflects the concern of a the group of macroeconomists who do not find in the core of macroeconomics theory an explanation of why we experienced the most important macroeconomic phenomenon since the Great Depression, the global crisis of 2008-2009 :

> "Then, why did the world enter into a recession in 2008-09? The response of the builders of the new Keynesian models with rational expectations is that in 2007 a large external shock came in the form of a sudden and unexpected increase in risk aversion. This change in risk

> perception then, like a hurricane, made its way through the economy and caused a deep recession. Thus, conventional macroeconomics has produced a "theory of hurricanes" of the economic cycle. "(De Grauwe 2012b, p. 124)

Meanwhile, in the wake of these crises, in the International Monetary Fund (IMF), which accounts the design for the world macroeconomic policy, there has been a discreet revolution led by the institution's chief economist, Olivier Blanchard, in the direction to resume the life of the traditional instruments of Keynesian macroeconomic stabilization.

a. Objections to Macroeconomics Theory

Objections to macroeconomics theory developed in the last four decades under the leadership of Robert Lucas have been very strong. According to Willem Buiter, chief economist at Citigroup:

> “Most mainstream macroeconomic theoretical innovations since the 1970s (the New Classical rational expectations revolution associated with such names as Robert E. Lucas Jr., Edward Prescott, Thomas Sargent, Robert Barro etc, and the New Keynesian theorizing of Michael Woodford and many others) have turned out to be self-referential, inward-looking distractions at best. Research tended to be motivated by the internal logic, intellectual sunk capital and esthetic puzzles of established research programs rather than by a powerful desire to understand how the economy works —let alone how the economy works during times of stress and financial instability.” (Buiter 2009, p.1).

Krugman has been even tougher:

> “Much of the last 30 years of macroeconomics has been spectacularly useless at best, and positively harmful at worst” (Krugman 2009, Lionel Robbins Lectures, LSE).

In an article widely reported after the 2008-2009 crisis, Krugman (2009) made a ruthless diagnosis of current Macroeconomics:

> “As I see it, the economics profession went astray because economists, as a group, mistook beauty, clad in impressive-looking mathematics, for truth (…) They turned a blind eye to the limitations of human rationality that often lead to bubbles and busts, (…) to the imperfections of markets —especially financial markets— that can cause the economy’s operating system to undergo sudden, unpredictable crashes; and to the dangers created when regulators don’t believe in regulation.” (Krugman 2009, NYT, September).

His attack was also headed towards the New Keynesians who had also fallen under the charms of rational individuals and perfect markets, and sought that their departure from the prevailing orthodoxy were the smallest possible. In their models, there was no room for bubbles or financial crises. The prevailing theory was immune to the basic facts of the Asian crisis of 1997-1998, or the 2002 depression in Argentina.

According to Krugman major disputes between these "freshwater" and "saltwater" macroeconomists did not refer to those who explained the best the facts but on those with used better techniques. Furthermore, in the New Keynesian models, within the instruments of monetary policy it was only considered monetary policy, which would be enough for macroeconomic stabilization and fiscal policy had been abandoned as a necessary tool to deal with recessions. Finally, these models assume that financial markets are efficient.

On the latter issue, Krugman also directs his attack on Eugene Fama, the father of the efficient markets hypothesis, according to which financial asset prices reflect all available information and immediately adjust to the new data that may arise. Consequently, in an efficient market, prices of financial assets are perfectly valued and there is no such thing as overvaluation or undervaluation of these assets because these prices reflect information known and investor expectations about the future.

In these models there is no room for bubbles (financial asset prices being well above their fundamental values). Krugman (2009) says that Fama, in an

interview in 2007 said "the word 'bubble' drives me crazy" and that there was no reason to distrust the housing market, because people are very careful when buying a house, look around carefully and compare prices.

Given these imperfections, Krugman, reaching the opposite standpoint to Blanchard (2008), concludes:

> “The state of macro, in short, is not good. So where does the profession go from here?” (Krugman 2009, NYT, September)

What are the tasks of macroeconomists in the future? According to Krugman:

> “First, they have to face up to the inconvenient reality that financial markets fall far short of perfection, that they are subject to extraordinary delusions and the madness of crowds. Second, they have to admit —and this will be very hard for the people who giggled and whispered over Keynes— that Keynesian economics remains the best framework we have for making sense of recessions and depressions. Third, they’ll have to do their best to incorporate the realities of finance into macroeconomics. (Krugman 2009, NYT, September).

In the spirit of Krugman, Keynes's famous phrase referring to the excessive concern over the long term, when there are urgent unresolved problems in the short term, would be fully valid nowadays:

> “Long run is a misleading guide to current affairs. In the long run we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is long past the ocean is flat again.” (J.M. Keynes, 1992, p. 95).

In the same position of Krugman, with an even greater forcefulness, Gordon (2009) expressed the need to return to the Macroeconomics previous of 1978. That Macroeconomics, according to Gordon, contains the elements to explained both the Great Depression, and the global crisis of 2008-2009, in a much more comprehensive way than contemporary macroeconomics.

> “Modern Macroeconomics have to flip the board and recognize that the time of the integrated vision of the world that offered the Macroeconomics of 1978 has been present and has been proven for over 30 years and can no longer be ignored "(Gordon, p. 26).

Of course, not everyone believes as Krugman or Gordon, that we've been living the "dark age of macroeconomics" because of ignoring the wisdom of ancients macroeconomists.

Cochrane (2011), from the University of Chicago, has responded to Krugman’s article (2009), and has defended the progress made in the last three decades. He argues that looking back is not worth.

> “Krugman argues that “a more or less Keynesian view is the only plausible game in town,” and “Keynesian economics remains the best framework we have for making sense of recessions and depressions.” One thing is pretty clear by now, that when economics incorporates flaws and frictions, the result will not be to rehabilitate an 80-year-old book. As Paul bemoans, the “new Keynesians” who did just what he asks, putting Keynes inspired price-stickiness into logically coherent models, ended up with something that looked a lot more like monetarism. (Actually, though this is the consensus, my own work finds that new-Keynesian economics ended up with something much different and more radical than monetarism.) A science that moves forward almost never ends up back where it started. Einstein revises Newton, but does not send you back to Aristotle.” (Cochrane 2011, p. 4)

Caballero (2010), from MIT, and Howitt, Kirman, Leijonhufvud, Mehrling and Colnader (2008), have an intermediate position between those who believe that everything goes well in Macro, and those who believe that we must change everything and/or return to the Macro before Lucas and his followers.

According to Caballero, in Macroeconomics there is currently a "core" and a "periphery", which are basically divorced. This distinction between core and periphery has nothing to do with the distinction between the fresh water economists or the salt water economists, or between the school of real

business cycle or the new Keynesians. They all belong to the core of macroeconomics. The core corresponds to the New Neoclassical Synthesis.

The current core is largely dominated by dynamic and stochastic general equilibrium models (DSGE), described above. The core problem with the Macro is that:

> "(…)has become so mesmerized with its own internal logic that it has begun to confuse the precision it has achieved about its own world with the precision that it has about the real one" (Caballero 2010, p.2).

But certainly, according to Caballero, for quite some time, the periphery of the Macro has proved to be more useful than the core helping to understand important macroeconomic events. For example, in the context of the financial crisis of 2008-2009, it is the periphery of the Macro who provided analytical frameworks for understanding phenomena such as speculative bubbles, the leverage cycle and bank runs for liquidity shortages, which had brought the world to the brink of a severe depression. This literature, located on the border between macroeconomics and corporate finance, was the one that provided the minimum analytical base that served to launch, in the world, macroeconomic policies to combat the crisis.

In the same vein, Howitt, Kirman, Leijonhufvud, Mehrling and Colnader (2008) note that:

> "While the standard DSGE representative models may look daunting, it is the mathematical sophistication of the analysis and not the models themselves which are difficult. Conceptually, their technical difficulty pales in comparison to models with more realistic specifications: heterogeneous agents, statistical dynamics, multiple equilibria (or no equilibria), and endogenous learning. Yet, it is precisely such models that are needed if we are to start to capture the relevant intricacies of the macro economy" (Howitt, Kirman, Leijonhufvud, Mehrling y Colnader 2008, p.5).

Meanwhile, the 2007 Nobel Laureate in Economics, Eric Maskin, notes that ancient literature, that in Caballero's terms would belong to the periphery among which stand out the classic work of Diamond and Dybvig (1983) and Holmstrom and Tirole (1993) about banks, bank runs and moral hazard problems, offer a persuasive explanation of the reasons that led to the global crisis of 2008-2009.

In Diamond and Dybvig (1983), for example, the role of banks and the notion of liquidity, and how the lack of the latter may cause a bank run, and the options for that not to happen, and the role played by regulation and deposit insurance, is very clear. What was not present in this article was the danger of moral hazard produced by deposit insurance.

Holmstrom and Tirole (1993) incorporated moral hazard into the framework of Diamond and Dybgig. To eliminate moral hazard, or significantly reduce it, those who invest in risky projects should be able to pay the consequences of that risky investment. Banks invest their depositors' money in these risky projects. Unless the bankers do not face the danger of breaking with these odds, they do not have incentives to make wise investments. In this context, Holmstrom and Tirole identify an important role for the government, beyond providing deposit insurance. In the model, riskier projects should be required to have a higher capital backing.

With this state of knowledge of Macroeconomics in the periphery, in theory, according to Maskin, the 2008-2009 crisis should not have occurred.

> “I think that the pieces to understand the current financial disaster were in their place a long time ago the crisis started. It is just that they were ignored. We are not going to completely eliminate financial crises, but we can make a better prevention and contention job” (Maskin 2009, p. 6)

Therefore, in clear opposition to the Nobel Krugman, who argues that the Macroeconomics of recent decades was not able to foresee the crisis, Maskin (2009) states categorically that that was not the problem:

> "I do not accept the criticism that economic theory did not provide a framework for understanding the crisis. In fact, documents we are discussing today show quite clearly why the crisis occurred and what we can do with it. The type of economy that deserves attack is the idealized world of Alan Greenspan, in which financial markets work perfectly well on their own and do not require government action. There are still, of course, economists-probably less than before-who believe in that world. But that is an extreme position and cannot be held by those who understand the items we are talking about "(Maskin 2009, p. 3 and 4).

The main problem therefore is the one pointed out by Caballero (2010):

> “The dynamic stochastic general equilibrium strategy is so attractive, and even plain addictive, because it allows one to generate impulse responses that can be fully described in terms of seemingly scientific statements. The model is an irresistible snake-charmer. In contrast, the periphery is not nearly as ambitious, and it provides mostly qualitative insights. So we are left with the tension between a type of answer to which we aspire but that has limited connection with reality (the core) and more sensible but incomplete answers (the periphery).” (Caballero 2010, pp. 2 y 3).

Caballero identifies the problem but is skeptical on its solution:

> “The ultimate goal of macroeconomics is to explain and model the (simultaneous) aggregate outcomes that arise from the decisions made by multiple and heterogeneous economic agents interacting through complex relationships and markets. Neither the core nor the periphery is able to address this incredibly ambitious goal very satisfactorily. The periphery has focused on the details of the sub problems and mechanisms but has downplayed distant and complex general equilibrium interactions. The core has focused on (extremely stylized) versions of the general equilibrium interactions and has downplayed the sub problems.

> The natural next step for the core, many would argue, is to add the insights of the periphery gradually into its dynamic stochastic general equilibrium structure. I am much less optimistic about this strategy, as I think it is plagued by internal inconsistencies and pretense-of-knowledge problems." (Caballero 2010 p.4)

In any case, according to Caballero, although challenges are great, the alternative of leaving all the important things of macroeconomic policy to informal commentators and characters cannot be the right approach.

Furthermore, since 2011, with the deepening of the crisis in the Euro zone, a renewed interest for macroeconomics on monetary zone reignited. The literature is rich and fascinating. The highlight of this literature is, certainly, what Belgian economist Paul De Grauwe (2008, 2011 and 2012a), ex-professor at the Catholic University of Leuven and current professor at the London School of Economics (LSE), and Nobel Laureate Paul Krugman (2012a and 2012b) have written.

According to these authors, with the introduction of the Euro (as a unit of account in January of 1999 and as banknotes and coins in January 2002), vanishes, by definition, the expected depreciation of financial assets from the periphery of the Eurozone and occurs a significant reduction in the risk premiums of these assets. At this stage, around the period of 1999-2008, there is a massive inflow of capitals that gradually lowers interest rates in the Eurozone periphery. Banks are full of liquidity; loans to the private sector explode and generate a housing bubble. Loans are also made to the public sector, so the price of sovereign bonds is inflated (interest rates on public debt fall to the floor). The low interest rate increases private spending and reactive economies. Reactivation raises tax revenues. This reactivation also boosts employment, wages and prices, and reduces the competitiveness of these economies, because it reduces the real exchange rate. Falling unemployment reduced government spending intended to unemployment insurance. The reduction in the interest rate and unemployment insurance spending, and the elevation of fiscal funding reduce the fiscal deficit and the public debt ratio as a percentage of GDP.

As banks are the main holders of government bonds, the rise of the price of these bonds, the value of banks' assets grow and banks are liquid and are solvent. As housing prices grew steadily, mortgage loans were paid without a hitch, delinquent portfolio were small, increasing the supply of loans. On the side of households, higher housing prices raised the value of collateral for future loans, increasing loan demand. European banks were never better than in the year prior to the global crisis of 2008-2009.

On the public sector side, it is cheaper for governments funding its financial requirements. There is no liquidity problem; its resources are above their financial requirements.

And since interest rates are very low, growth is high, and the debt/GDP ratio is in full decline, it is easy to generate the primary surplus needed to maintain constant the government debt/GDP ratio. Public debt is clearly sustainable.

It is the, short, golden age of the Euro. The Golden stage was interrupted by the global crisis of 2008-2009 with its epicenter in the United States. That was the exogenous variable or the trigger for the crisis in Europe. However, given the institutional framework of the Euro area (lack of labor mobility, fiscal integration and a lender of last resort), the trigger may have been another, even endogenous to the Eurozone (De Grauwe, 2008 and 2011).

The first effect of the global crisis was the bursting of the housing bubble that large capital inflows had generated in the periphery of the Eurozone. That episode, to which must be added, probably, the discovery that the Greek public debt was higher than shown by official figures and the animal spirits of investors, began a sudden spike in risk premiums thus generating a growing differential in interest rates between the assets of counties in the core vs the periphery. Animal spirits (De Grauwe 2008) are defined as waves of optimism and pessimism that take over consumers and investors, who have prophetic self-fulfilling properties that influence output and investment.

With the rise in the risk premium in the periphery investors found that financial assets of the periphery, such as Greek’s assets, were not the same as German assets. The interest rate differential caused a violent capital flight

from the periphery. Banks turned illiquid, loan supply disappeared and the housing bubble burst. On the public side, sovereign bond prices began to plummet (interest rates on public debt began to rise).

Higher interest rates bring down private spending and the economy enters into a recession. Tax revenue falls with the recession. The recession also reduces employment, wages and prices, and increases the competitiveness of these economies (raises the real exchange rate) but, given the lowering low elasticity of wages and prices, to an extent nothing compared to the loss of competitiveness in the previous stage of the boom. Higher unemployment raises government spending intended to unemployment insurance. Rising interest rates and spending on unemployment insurance, and the decrease in revenues, increase fiscal deficit and the public debt ratio as a percentage of GDP.

As banks are the main holders of sovereign bonds, falling government bond prices reduce the value of bank assets and many banks become illiquid and/or insolvent. As the price of houses falls systematically, mortgage loans that were being paid without a hitch, began to become a part of the non-performing portfolio, reducing the supply of loans. On the side of households, lower housing prices reduced the value of collateral for future loans, driving down demand for loans. European banks were never worse than in the period 2011-2012.

On the public sector side, with low prices of sovereign bonds (high interest rates), it was very difficult for governments to finance the public sector borrowing requirements. There is an obvious problem of liquidity, which is what caused the default in several European countries.

And as interest had risen in the periphery and economic growth rates were reduced, the expected primary surplus is below the level needed to maintain public debt as a percentage of GDP constant. Added to the liquidity problem then there is a solvency problem.

And given that there is not a lender of last resort, as in the case of the United States, who could put a limit to the decrease in the price of government bonds; the European crisis may last longer.

The institutional framework of the Eurozone makes it inherently fragile. The fragility comes from the lack of mobility of labor, lack of fiscal integration among its members and the lack of a lender of last resort to end bank runs and runs against sovereign bonds.

The solution should come, basically, from any policy that could reduce interest rates in the Eurozone periphery. If the higher risk premium is the cause of rising interest rates, the recipe has to be necessarily with policies that counteract the effects of the higher risk premium and could reduce the interest rate

That goal can only be achieved in the short term if the European Central Bank (ECB) decides to implement a policy aggressively expansionary that injects liquidity to banks, so that they reduce their interest rates and raise the demand for bonds, in order to raise prices, to reduce interest rates and government could fund its financial requirements and not fall into default as was the case of Greece or Portugal.

The expansionary monetary policy launched by the ECB in late 2011 and early 2012 has worked. By mid-2013 risk premiums in countries with serious fiscal problems such as Spain and Italy have been significantly reduced and Europe all seems to be coming out, finally, from the worst phase of the crisis.

This does not mean that the fiscal situation is a minor issue. In the short term the ECB helps to solve the problem of liquidity, helping governments to reach their financial requirements. In perspective we must solve the problem of fiscal solvency with contractionary fiscal policies scheduled for the next 10 or 20 years.

The European crisis has also served to evaluate the contributions of Richard Koo (2008) to the understanding of global crises. Koo, chief economist at a research institute linked to the largest financial firm in Tokyo, Nomura

Securities, has an original vision of the European crisis and the crisis of 2008-2009, from his studies of the Japanese "lost decade" of the nineties. His hypothesis is that the Japanese, as the 1929, and the 2008-2009 crises and the recent European crisis are "recessions of balances" for deleveraging or debt reduction ("balance sheet recession").

This kind of recessions are preceded by financial and real estate bubbles that burst and lead to sudden and violent falls in prices of financial assets, land and buildings. When this occurs, the priority and obsession of businesses and families who suddenly see their wealth destroyed becomes making their balance sheets stronger as quickly as possible.

The problem is that if businesses and families save all they can to pay their debts, the investment of the former and the consumption of the latter are reduced, thus private spending falls, causing Keynesian recession and unemployment. The usual response of macroeconomic policy against recessions is the reduction of the interest rate (monetary policy) and the raising of public spending or reducing taxes (fiscal policy)

Koo argues that monetary policy does not work to end this special kind of recessions by debt reduction since although the interest rate is zero credit does not increase because the private sector does not want any more debt. When a drastic loss of value of assets financed with debt is produced, firms and households make all necessary efforts to reduce their level of debt and new debt claim. Credit availability is not the problem, but the lack of demand.

Under these conditions, the only tool of macroeconomic policy is government spending (not taxes because agents would use it to pay debts and not spending). As long as the private sector saves and does not spend, the public sector must dis-save (borrow) and spend.

A key implication of the Koo hypothesis is that recessions by deleveraging are long-lasting until firms and households reach a financial position that allows them to go back to the credit markets again. Crises can be even longer if in this context the government tries to save, to pursue a contractionary fiscal policy.

b. The International Monetary Fund (IMF) and the objections to macroeconomic policy

The macroeconomic policy regime propped from the IMF over the past four decades has undergone a substantial shift in the last five years. The reasons are, I think, basically, two. First, the international crisis of 2008-2009, the most severe since 1929, has forced the agency to advocate for new targets and new macroeconomic policy instruments. Secondly, there was the divine coincidence that the worst of the crisis came just when they had just appointed Olivier Blanchard, in September 2008, as the IMF's chief economist. Blanchard, French economist, professor at the prestigious Massachusetts Institute of Technology (MIT), one of the world's top macroeconomists had the precise profile to lead a revolution in the design of macroeconomic policies sponsored by the IMF.

Major changes have occurred in the fields of short-term capital flows, the role of countercyclical fiscal policy and the relevance of the intervention in the exchange market. In terms of Caballero (2010), it seems that all these changes have as origin the periphery of macroeconomics. Another example of the existence of a problem with the current core of macroeconomics.

<u>The capital flows controls</u>

In Ostry, Ghosh and Korinek (2012) it is presented the IMF's institutional vision regarding liberalization and managing capital flows. In direct opposition to the traditional view of the IMF, of unrestricted sympathy for the openness to the free movement of short-term capitals, the current position is more pragmatic and less ideological, a clear reflection of the personality of Blanchard:

> "Pragmatism is of the essence (…) we have to test carefully and see how they work" (Blanchard 2011 p. 1).

Although the IMF recognizes the significant benefits that capital inflows can provide to countries, in this paper he warns about all its potential risks. Capital flows, inflows or outflows, since they essentially respond to the

differential between the domestic interest rate and the international interest rate adjusted for a risk premium, are transitory flows that can be quickly reversed as the differential rate changes, usually when interest rates in advanced economies return to normal levels.

A massive capital inflow can produce an *undershooting* of the exchange rate, a fall in the exchange rate below its long-term value, which may put in risk the tradable sector of the local economy. Also, capital inflows make bank credits cheaper and plentiful, which can produce a bubble, an *overshooting*, in prices of financial and non-financial assets. The credit boom also boosts consumption and private investment, and consequently, growth rates of the economy above its long term trend.

When the international financial situation is modified, when capitals stop going in and start leaving, everything described is reversed, and economies can enter in the phase of a sudden stop: overshooting of the exchange rate, plummeting of asset prices and recession.

Capital flows, then, can increase the volatility of economies and the objective of capital controls is to reduce the size of that volatility.

Given these risks, unrestricted liberalization of the capital account may not be the right policy for all countries at all times, and control of these flows may be necessary to safeguard macroeconomic stability and health of the local financial system in the presence of sudden entrances or runs of capitals.

A key question is, of course, if capital controls have worked in practice. The evidence that IMF shows for the cases of Chile and Colombia is that while controls did not significantly affect the aggregate volume of capital, appear to have a significant effect on its composition, in favor of long-term capital.

On the other hand, resuming an old idea from J.M. Keynes, of monitoring the movement of capital "at both sides of the transaction," the IMF document also expresses the shared responsibility of countries of origin, whose policies can contribute to excessive and risky capital outflows.

Countercyclical fiscal policy

After the golden age of Keynesianism of the 50s and 60s of last century, and the jump in the inflation rate in the developed world in the 70's, the role of fiscal policy became secondary in the last two or three decades. Skepticism about the effects of fiscal policy, largely due to arguments in favor of Ricardian equivalence, concerns about delays and political influence in its design and implementation, and the need to reduce generally high public debt levels, eventually reduce the role of fiscal policy as an instrument of macroeconomic policy, at least in the developed world.

However, in its relationship with developing countries, the IMF did believe strongly in the effectiveness of fiscal policy. Traditionally, the IMF, used to deal with developing countries with some sort fiscal problem, operated with a single recipe: cutting spending and/or raising taxes. Never mind that the economy in question is going through a deep recession, fiscal austerity was always the recipe. In the eighties of the last century, during the public debt crisis, in the midst of the recession which in some cases became depression, almost all Latin American countries applied the contractionary fiscal policies which were dictated in the not so dearly "Intention letters" signed with the IMF.

With the international crisis of 2008-2009, and especially with the European crisis of 2011-2012, fiscal problems have ceased to be a monopoly of under-developed countries and began to strongly affect a large set of developed countries such as Japan, United States, Spain, Italy and France, among others. The IMF's recipe for these countries, as seen in Spilimbergo, Symansky, Blanchard y Cottarelli (2008) y Blanchard, Dell'Ariccia y Mauro (2010), differs radically from that applied to Latin-Americans.

According to the new position of the IMF, with these crises, advanced economies face the difficult task of implementing fiscal adjustment strategies while being careful not to undermine the economic recovery still fragile. It is recognized that fiscal adjustment is key to private investment and long-term economic growth. Fiscal adjustment can also be important in some countries

to prevent the crisis in the financial markets that could affect growth through its effects on confidence and credit. But excessive fiscal tightening could hinder growth and that is not a trivial risk.

For a few countries, bringing forward fiscal adjustment may be necessary to maintain access to markets and finance the deficit at a reasonable price, but in general, a slower pace of adjustment could be better than a drastic adjustment that could undermine or reverse recovery. It should be a long-term objective reducing the public debt ratio to GDP, but that goal cannot be achieved immediately.

The crisis has meant the abandonment of the Ricardian equivalence theory, which postulated the futility of fiscal policy, and has restored the stabilizing, counter-cyclical role of fiscal policy. According to the IMF, the crisis has returned attention to fiscal policy for two main reasons. First, monetary policy has reached its limits. Interest rates cannot be reduced more and in some countries there is a "liquidity trap", in the sense that the extraordinary increase of the monetary base has not implied, as in other episodes, a recovery of bank credit, because businesses and households do not demand new loans since they are immersed in a process of balance sheet repair.

Second, given that the current recession is long-lasting, the problem of delays in fiscal policy has moved to the background, so it was clear that fiscal stimulus would have ample time to produce a positive impact on the economy.

As the 2008-2009 crisis began, the IMF, in the paper of Spilimbergo, Symansky, Blanchard and Cottarelli (2008) advocated an aggressive expansionary fiscal policy that should have the following characteristics:

i) Must be applied immediately, so that the crisis does not become acute;

ii) The fiscal stimulus should be large, in line with the fall in demand caused by the collapse of consumption and private investment;

iii) Given the expected duration of the crisis, fiscal stimulus should be durable;

iv) As there is uncertainty as to which measures are effective stimulus, the stimulus should be diversified;

v) Given the severity of the global recession, fiscal stimulus should be applied globally; and finally,

vi) The fiscal stimulus should be sustainable, to avoid the explosion of public debt and its short-term adverse effects.

Regarding of fiscal policy effectiveness, the existence of significant fiscal multipliers that justify tax intervention has been documented in one of the latest publications of the IMF (IMF 2012, Ch 1, Box 1.1).

The crisis has also shown the importance of having a "fiscal margin", as some economies that entered the crisis with high levels of public debt had limited ability to use fiscal policy. A key lesson from the crisis is the convenience of generating a large fiscal margin in the expansionary phase of the economic cycle in order to finance larger fiscal deficits in the downturn of the economic cycle.

In the future, when the economic recovery is assured, the necessary degree of fiscal adjustment will be very large, in light of the need to reduce the massive public debt that will leave the current international crisis, and the financing challenges related to aging on pensions and health care.

The role of intervention in the exchange market

Even before the global crisis, the IMF's official position was that of non-intervention in the exchange market. In particular, it was stated that a natural component of the new monetary policy framework based on the Inflation Targeting (IT) was a floating exchange rate. Since the only purpose of the scheme was price stability, and given that we counted with only one policy instrument, the interest rate on short-term, there was no room for the control or management of the exchange rate. The IT scheme was incompatible with the intervention in the exchange market. With free capital mobility, the

attempt to control the exchange rate was absurd because it would clash with the "impossible trinity": with free capital mobility, it is not possible to control the interest rate and the exchange rate, simultaneously.

But in the real world, on one hand, capital mobility is far from being perfect and, on the other hand, in certain circumstances, it may be good for the economy the intervention in the exchange market to prevent excessive volatility in that market.

That is the position that the IMF currently expresses through the work of Ostry, Ghosh and Chamon (2012) which states the case where a central bank may have two goals, to keep inflation low and stable and avoid substantial deviations of the exchange rate from its long-term average, which can be achieved through two instruments: the interest rate and sterilized intervention in the foreign exchange market.

According to that IMF paper, in countries with large currency mismatches in internal balances, with important transfer effects of the exchange rate on inflation and with limited inter-sectoral mobility of factors, ignoring the high volatility of the exchange rate can be very expensive for the economy.

If, for example, there is a sudden increase in capital inflows which leads to a large decrease in the exchange rate below its long term average value, and produces distortions in the financial market (credit in foreign currency becomes cheaper than what is expected in the long term) and in the goods market (the Dutch disease), then, in these conditions, intervention in the foreign exchange market may be the best option, even in a IT scheme.

Such intervention should be carried out only against shocks that move the exchange rate out of its long-term average. Therefore, interventions should be symmetrical, both in front of a reduction of the exchange rate below its long-run level as its elevation above the long-term level.

Thus, the IMF has shifted in the direction of recognizing the importance of controlling the flow of financial capitals, of counter-cyclical fiscal policy and interventions in the exchange market as macroeconomic stabilization tools.

4.3 The future of Macroeconomics

What will be the development of macroeconomic theory in the coming years?

It seems clear to me that this development will not be on the itinerary that Krugman (2009) and Gordon (2009) are proposing, which consists on the restoration of macroeconomic theory prevalent in the seventies of the last century. In exception from undergraduate courses, in any master or doctoral degree with prestige in the world that Macroeconomics is taught. In the top ranked universities in the world, where great theoretical revolutions have sprouted, such as the Massachusetts Institute of Technology (MIT), Harvard, Chicago, Cambridge, Berkeley (California) or Stanford, core Macroeconomics are taught: the New Neoclassical Synthesis. In all these universities the heart of the Macro is the DSGE model. It is unrealistic to expect, then, the DSGE to be left and to return to the IS-LM and the Phillips curve.

Alan Blinder, a member of the Council of Economic Advisers of President Bill Clinton and Vice President of the Board of Governors of the Federal Reserve System of the United States between 1994 and 1996, raised three proposals to improve macroeconomic theory, especially the addressed to teaching in undergraduate levels (Blinder 2010). First, within Macroeconomics, more space should be given to the study of business cycles; a room that had been reduced in recent decades, to put emphasis on economic growth. Second, it must be increased the space allocated to Keynesian macroeconomics since without it, it is impossible to explain events such as those of 2008-2009. Third, in both simple models as in the complex ones, we have to leave those with "a unique rate of interest." The financial system has become so sophisticated that it is impossible to analyze an economy with existing models where there is only a financial asset.

The healthiest and yet complicated solution will probably be to meet the demand of Caballero (2010) or Howitt, Kirman, Leijonhufvud, Mehrling and Colnader (2008), of maintaining the technology of the core of macroeconomics, but incorporating relevant issues of the real world, which until now have only been seen by the Macroeconomics of the periphery. The

models pointed out by Askin (2009), which allow us to fully understand of the financial aspect of the international crisis of 2008-2009, for example, should be incorporated in the core of macroeconomic theory. The challenge, of New Neoclassical Synthesis incorporating these new elements is, of course, huge.

So far, in my opinion, the only move in the direction of incorporating in the New Neoclassical Synthesis the essential aspects of what is observed in the world economy is the one exhibited by the Belgian economist Paul De Grauwe. He, unlike the other reviewers, apart from noting the limitations of current macroeconomic theory, has advanced proposing an alternative that appears to be appropriate: in terms of form, he uses the modern "technology" of modern macroeconomics, and in background aspects, allows answering relevant questions to the current global macroeconomic environment. That is what we see in the book of De Grauwe (2012b). This books is an answer, to some extent, to the demands of Caballero (2010), but from the periphery of macroeconomic theory.

The questioning of De Grauwe the current Macroeconomic Theory revolves around the rationality of economic agents and the exogenous nature of economic cycles in the DSGE models.

On the rationality of economic agents, the general perception that the U.S. crisis of 2008-2009 and the 2011-2012 European crisis left is that financial crises occurred as a result of inefficiencies in the financial markets and poor risk perception of economic agents. However,

> "(...) the main macroeconomic models, as shown by the model of dynamic stochastic general equilibrium (DSGE), are populated by agents that maximize profits in an intertemporal framework using all available information, including the model structure (...). In other words, agents in these models have incredible cognitive abilities. They are able to understand the complexities of the world, and can figure out the probability distributions of all disturbances that can affect the economy. These are extraordinary circumstances that perplex the

> outside world about what macroeconomists have been doing for decades "(De Grauwe, 2009, p.1).

De Grauwe (2009, 2010) points out that the direction that macroeconomics has taken, assuming that agents clearly understand the structure of the models, is surprising, since other branches of science, such as psychology and neurology, have exposed the cognitive limitations of individuals. Of these sciences we have learned that agents understand only bits and pieces of the world they live in, and instead of maximizing (utility or profits) taking into account all available information, optimize with limited information, and continually correcting their errors.

The second issue, related to the first, is that in these models (as the DSGE) fluctuations in the level of economic activity and prices occur because agents with rational expectations cannot adjust their optimal plans instantaneously after an exogenous shock, because there are some sticky prices and wages. Cycles in these models are from a fully exogenous origin. For example, the financial crisis of 2008-2009 would have had its origin in an unpredictable exogenous elevation of the risk premium in the United States in August 2007. There is no way, in these models, to produce endogenous business cycles.

Therefore, according to De Grauwe (2009, 2010), there are two types of macroeconomic models,

> "The first type are *top-down models* in which some or all agents are capable of understanding the whole picture and use this superior information to determine their optimal plans. The second type are *bottom-up models* in which all agents experience cognitive limitations. As a result, these agents are only capable of understanding and using small bits of information. These are models in which agents use simple rules of behavior. These models are not devoid of rationality. Agents in these models behave rationally in that they are willing to learn from their mistakes. These two types of models produce a radically different macroeconomic dynamics. I analyze these differences." (De Grauwe, 2010, p.1).

In the top-down models economic agents can use the model they know to optimize their private welfare. These models with rational expectations are very similar to centralized planning models in the sense that, the representative individual, like the central planner, believes that he understands the entire world. It is in this sense that they are top-down models.

In the bottom-up models, individuals comprise only a very small part of the world and apply simple rules to achieve their goals. In these models, economic agents use simple rules of behavior, and gradually learn the world, by "trial and error". In these models there is room for beliefs or assumptions that generate waves of optimism and pessimism, similar to the "animal spirits" of Keynes, producing endogenous business cycles, as those described by Akerlof and Shiller (2009).

Although there has been a development of the literature of imperfect information models, these models are based primarily on a statistical learning approach which, according to De Grauwe, still supposes individuals with very sophisticated cognitive abilities in relation to the real world. These models can also be classified as "*top-down models"* because agent's ambition is to achieve perfect information that is reached at the edge.

In contrast to the DGSE models, in the *bottom-up model* individuals do not have rational expectations, they have information problems, they do not fully understand the nature of the disturbance and neither their transmission mechanisms. In the process of learning by trial and error waves of optimism and pessimism will be generated, which produce economic fluctuations.

Putting aside the powerful rational expectations hypothesis is not a simple task.

> "Trying to get out of the model of rationality and rational expectations has, of course, a risk. Paradigm advocators of the fully informed rational agent told us that there are millions of different ways one can deviate from rationality. Thus, there would be no hope of reaching any meaningful conclusion once one enters into the world of irrationality.

> My argument has been very strong (...). My argument is that one can depart from this particular formulation of rationality, without having to wander the dark world of irrationality.
>
> My intention is to show that once we accept the idea that individuals have cognitive limitations, and therefore are not able to fully understand the complexity of the world (...), it is possible to develop models based on a different notion of rationality. Also I have the intention to show a richer macroeconomic dynamics that is closer to the observed dynamics of output and inflation that the one produced by conventional macroeconomic models. "(De Grauwe 2012b, p. vii and viii).

In this alternative, the business cycle, then, has an important endogenous component, as in the models developed by Minsky. In this approach, the 2008-2009 crisis may stem from the economic boom in the years before and the business cycle cannot be interpreted, as in DSGE models, as a theory of hurricanes or tornadoes:

> "In the world of DSGE, the financial crisis that began in August 2007 and the deep recession that followed it, was caused by unexpected exogenous shock in 2007 that, as a tornado, created chaos in the financial markets and the macroeconomics. In fact, it is now standard practice among those who make the type DSGE models to simulate the consequences of the financial crisis on the economy by introducing an exogenous increase in risk aversion (the risk premium). In contrast, the behavioral model developed in this chapter is able to generate endogenous cycles of boom and bust. This model guides the view that the crisis of 2007-08 was the result of the boom generated by the previous excessive optimism "(own translation, De Grauwe 2012B, p. 35).

We will see if Macroeconomics moves forward in the coming years in the pioneer path initiated by De Grauwe, or departs and deepens the in the path suggested by the Nobel prize Maskin (2009).

This is, briefly, the current state of macroeconomic theory and policy.

In the following decades we will be the witnesses of the direction taken by macroeconomic theory. Hopefully, Macroeconomics in future will develop in the direction of using all the "technology" newly discovered in recent decades, that from the New Neoclassical Synthesis, and hoping that this technology be rendered to service the understanding of relevant global economic problems.

In the field of macroeconomic policy, let us trust that the IMF and the institutions in charge of fiscal policy and monetary policy in the world, central banks and finance ministries, further progress in line to have the correct answers for old problems and new macroeconomic challenges that will probably appear in the future.

For Latin American macroeconomists the challenge is far greater. It is necessary to keep up with relevant contemporary literature and work with it to modify it or adapt it to our particularities.

REFERENCES

Akerlof, George y Janet Yellen
1985 *A Near-Rational Model of the Business Cycle with Wage and Price Inertia*, *Quarterly Journal of Economics*, 100.

Akerloff, George y Robert Schiller
2009 *Animal Spirits: Cómo influye la psicología humana en la economía*, Editorial Planeta DeAgostini, Barcelona.

Alesina, Alberto y Lawrence Summers
1993 *"Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence*, Journal of Money, Credit and Banking, N° 25, pp. 151-162.

Alexander, Sidney
1971 Efectos de una devaluación sobre la balanza comercial, en Caves Richard y Harry Johnson (compiladores), *Ensayos de Economía Internacional*, Amorrortu editores, Buenos Aires.

Argandoña, Antonio, Gámez, Consuelo y Francisco Mochón.
1997 *"Macroeconomía Avanzada*", Tomos I y II, McGraw Hill. España.

Arnott, Richard; Hosios, Arthur y Joseph Stiglitz
1988 *Implicit Contracts, Labor Mobility and Unemployment*, American Economic Review, Vol. 78, pp. 1046-1066.

Attfield Clifford; Demery, David y Nigel Duck.
1991 *Rational Expectations in Macroeconomics. An introduction to Theory and Evidence*, Oxford: Blackwell, 2ª Ed.

Azariadis, Costas
1975 *Implicit Contracts and Underemployment Equilibria*", Journal of Political Economy, *N*° 83, pp. 1183-1202.

Backus, David y John Driffil
1983 *Rational Expectations and Policy Credibility Following a Change in Regime*", Review of Economic Studies, N° 52, pp. 211-221.
1985 *Inflation and Reputation,* American Economic Review*,* 75.

Baily, Martin
1974 *Wages and Employment under Uncertain Demand*, Review of Economic Studies, Vol. 41, pp. 37 - 50.

Ball, Lawrence y Stephen Cecchetti
1988 *Imperfect information and Staggered Price Setting*, American Economic Review, N° 78, pp. 999-1018.

Ball, Lawrence y David Romer
1989 *Are Prices too Sticky*?, Quarterly Journal of Economics, N° 104, pp. 507-524.
1991 *Sticky Prices as Coordination Failure*, American Economic Review, N° 81, pp. 539-552.

Barro, Robert
1974 *Are Government Bonds Net Wealth?,* The Journal of Political Economy, Vol. 82, N°6 pp 1095 - 1117
1976 *Rational Expectations and the Role of Monetary Policy*, Journal of Monetary Economics, 2, pp 1-32
1986 *Reputation in a Model of Monetary Policy with Incomplete Information*, Journal of Monetary Economics, 17, pp 3-20

Barro, Robert y David Gordon.
1983 *Rules, Discretion and Reputation in a Model of Monetary Policy*, Journal of Monetary Economics, N° 12, pp. 101-121.

Baumol, William.
1952 *The Transactions Demand for Cash: An Inventory Approach*, Quarterly Journal of Economics, Vol. 66, pp. 545-556.

Begg, David
1982 *The Rational Expectations Revolution in Macroeconomics. Theories & Evidence,* Oxford, Philip Allan Publishers Ltd.
1989 *La Revolución de las Expectativas Racionales en la Macroeconomía*, Fondo de Cultura Económica, México.

Bernanke, Ben.
1983 *Non-Monetary Effects of the Financial Crisis in the Propagation of the Great Depresion*, American Economic Review, N° 73, pp. 257-276.

Bernanke, Ben y Alan Blinder
1988 *Credit, Money, and Aggregate Demand*, American Economic Review, N° 78, pp. 435-439.

Bernanke, Ben y Mark Gertler
1989 *Agency Costs, Net Worth, and Business Fluctuations*", American Economic Review, N° 79, pp. 14-31.
1990 *Financial Fragility and Economic Performance*, Quaterly Journal of Economics, N° 105, pp. 87-114.

Black, Stanley
1973 *International Money Markets and Flexible Exchange Rates*, Princeton Studies in International Finance, N° 32.

Blanchard, Olivier
1983 "Price Asychronization and Price Level Inertia", en *Inflation, Debt, and Indexation* por R. Dornsbuch y M. Simonsen (editores), MIT Press Cambridge.
2008 *The State of the Macro*, NBER Working Paper Series N° 14259.

2011 *The future of macroeconomic policy: Nine tentative conclusions*, VOX, March 23.

Blanchard, Olivier; Dell'Ariccia, Giovanni y Paolo Mauro
2010 *Rethinking Macroeconomic Policy*, IMF Staff Position Note, SPN/10/03, February 12.

Blinder, Alan
2010 *Teaching Macro Principles after the Financial Crisis*, Working Paper N° 1222, Princeton University, Department of Economics, Center for Economic Policy Studies.

Buiter, Willem
2009 *The unfortunate uselessness of most 'state of the art' academic monetary economics*, Blog de Financial Times, 3 de marzo.

Caballero, Ricardo
2010 *Macroeconomics after the Crisis: Time to Deal with the Pretense-of-Knowledge Syndrome*, NBER Working Paper Series N° 16429.

Carlton, Dennis
1986 *The Rigidity of Prices*, American Economic Review, Vol. 76, N°. 4, pp. 637-658.

Chari, Varadajan y Patrick Kehoe
2006 *Modern Macroeconomics in Practice: How Theory Is Shaping Policy*, Journal of Economic Perspectives, Vol. 20, N° 4, pp. 3-28.

Cechetti, Stephen
1986 *The Frecuency of Price Adjustment: a Study of the Newsstand Prices of Magazines, 1953 to 1979*, Journal of Econometrics, vol. 31, pp 255-274.

Clarida, Richard; Galí, Jordi, y Mark Gertler
1999 *The Science of Monetary Policy: A New Keynesian Perspective.* Journal of Economic Literature. Vol. XXXVII, diciembre, pp 1661-1707.

Cooley, Thomas (editor)
1995 *Frontier of Business Cycle Research*, Princeton University Press: Princeton.

Cooper, Russell y Andrew John
1988 *Coordinating Failures in Keynesian Models,* Quaterly Journal of Economics, N° 103, pp. 441-463.

Cochrane, John
2011 *How did Paul Krugman Get it so wrong?*, Institute of Economic Affairs, Oxford.

Cukierman, Alex; Webb, Steven y Neyapti Bilin
1992 *Measuring the Independence of Central Banks and its Effect on Policy Outcomes*. The World Bank Review, Vol. 6, No 3, pp. 353-398.

De Grauwe, Paul
2008 *Animal Spirits and Monetary Policy*, CESifo Working Paper N° 2418
2009 *Top-Down Versus Bottom-Up Macroeconomics,* VOX, noviembre.
2010 *Top-Down Versus Bottom-Up Macroeconomics*, CESifo Economic Studies Vol. 56, N° 4, 465-497.
2011 *Managing a Fragile Eurozone*, CESifo, forum 12 (2), pp. 40-45.
2012a *Lessons from the Eurocrisis for East Asian Monetary Relations*, The World Economy.
2012b *Lectures on Behavioral Macroeconomics*, Princeton University Press, Princeton.

Diamond, Peter
1982 *Aggregate Demand Management in Search Equilibrium"*, Journal of Political Economy, N° 90, pp. 881-894.

Diamond, Peter y Philip Dybvig
1983 *Bank Runs, Deposit Insurance, and Liquidity*, The Journal of Political Economy, Vol. 91, N°. 3, pp. 401-419.

Dornbusch, Rudiger
1976 *Expectations and Exchange Rate Dynamics*, Journal of Political Economy, Vol. 84, N° 6, pp. 1161-76.
1980 *Open Economy Macroeconomics*, New York, Basic Books.

Esquivel, G. y F. Larrain
1998 "Explaining Currency Crises," mimeo.

Fisher, Irving
1926 *A Statistical Relation between Unemployment and Price Changes*, International Labor Review, junio. Reimpresa en Journal of Political Economy, marzo/abril 1973.

Fischer, Stanley
1977 *Long-term Contracts, Rational Expectations and the Optimal Money Supply Rule*, Journal of Political Economy, N° 85, pp. 163-190.

Fleming, Marcus
1962 *Domestic Financial Policies Under Fixed and Under Floating Exchange Rates*, International Monetary Fund Staff Papers N° 9, pp. 369-379.

Flood Robert y Peter Garber
1994 "Collapsing Exchange-Rate Regimen: Some Linear Examples," en Flood y Garber, *Speculative Bubbles, Speculative Attacks, and Policy Switching*, The MIT Press.

Frenkel, Jacob y Harry Johnson
1976 "The Monetary Approach to the Balance of Payments. Essential Concepts and Historical Origins", en Frenkel y Johnson (Edits.), *The Monetary Approach to the Balance of Payments*, George Allen & Unwin Ltd.

Friedman, Milton
1957 *A Theory of the Consumption Function*, Princeton Univesity Press, Princeton, New Jersey.
1968 *The Role of Monetary Policy*, American Economic Review N° 58.
1971 "Aspectos favorables de los tipos de cambio flexibles", en Caves Richard y Harry Johnson (compiladores), *Ensayos de Economía Internacional*, Amorrortu editores, Buenos Aires.

Friedman, Milton y Ana Schwartz
1963 *A Monetary History of the Unites States, 1867-1960*, Princeton University Press, Princeton, New Jersey.

Goodfriend, Marving y Robert King
1997 "The New Neoclassical Synthesis and the Role of Monetary Policy", en Bernanke y Rotemberg (editores), *NBER Macroeconomics Annual 1997*, Volume 12, MIT Press, USA.

Goodfriend, Marving
2002 *Monetary Policy in the New Neoclassical Synthesis: A Primer*, International Finance, Vol. 5, N° 2, pp. 165-191.

Gordon, Robert.
1974 *A Neoclassical Theory of Keynesian Unemployment*, Economic Inquiry, Vol. 12, pp. 431-459.
2009 *Is Modern Macro or 1978-era Macro More Relevant to the Understanding of the Current Economic Crisis?*, versión revisada del documento presentado en el International Colloquium on the History of Economic Though, realizado en Sao Paolo en agosto de 2009..

Greenwald, Bruce y Josephs Stiglitz
1988 *Financial Market Imperfections and Business Cycles*, NBER Working Paper N°. 2494.

Hansen, Gary
1985 *Indivisible Labor in Business Cycle*, Journal of Monetary Economics, N° 6, pp. 309-327.

Hart, Oliver
1983 *Optimal Labor Contracts under Asymmetric Information: And Introduction*", Review of Economic Studies, Vol. 50, pp. 3-35.

Hicks, John
1937 *Mr. Keynes and the Classics: A Suggested Interpretation*, Econométrica, Vol. 5, pp. 147-159.

Holmstrom, Bengt y Jean Tirole
1993 *Market Liquidity and Performance Monitoring*, The Journal of Political Economy, Vol. 101, N° 4, pp. 678-709

Howit, Peter; Kirman, Alan; Leijonhufvud, Axel; Mehrling, Perry y David Colander
2008 *Beyond DSGE Models: Towards an Empirically Based Macroeconomics*, Middlebury College Economics Discussion Paper N° 08.

Hume, David
1752 "On the Balance of Trade", en *Essays, Moral, Political and Literary*, Vol. I, Longmans Green, Londres, 1898.

Johnson, Harry
1976 "The Monetary Approach to Balance-of-Payments Theory", en Frenkel y Johnson (editores), *The Monetary Approach to the Balance of Payments*, George Allen & Unwin Ltd.

Katz, Lawrence
1988 *Some Recent Developments in Labor Economics and Their Implications for Macroeconomics*, Journal of Money Credit and Banking, Vol. 20, pp. 507-522.

Keane, Michael y D. E. Runkle
1990 *Testing the Rationality of Price Forecasts: New Evidence from Panel Data*, American Economic Review, N° 80, pp 714 - 735

Keynes, John Maynard.
1936 *The General Theory of Employment Interest and Money*, Royal Economic Society, Londres.
1996 *Breve Tratado Sobre la Reforma Monetaria,* Fondo de Cultura Económica, México.

King, Robert y Charlkes Plosser
1984 *Money, Credit, and Prices in a Real Business Cycle*, American Economic Review, 74, pp 363-380

King, Robert y Sergio Rebelo
2000 "Resuscitating Real Business Cycle", en J. Taylor and M. Woodford (editores), *Handbook of Macroeconomics*, North-Holland: Amsterdam, pp. 927-1007.

Krugman, Paul
1979 "*Model of Balance-of-Payments Crises*", *Journal of Money, Credit, and Banking*, Vol. 11, N°. 3, pp 311-325.
1998 *Currency Crises*, mímeo, MIT.
2009 *How did Economists Get It So Wrong?,* New York Times, 2 de setiembre
2012a *End this Depression Now¡*, W.W. Norton Company, New York.
2012b *Revenge of the Optimum Currency Area,* blog NYTimes.

Kydland, Finn y Edward Prescott
1977 *Rules Rather than Discretion: The Inconsistency of Optimal Plans*, Journal of Political Economy, N° 85, pp 473 – 491.
1982 *Time to build and aggregate fluctuations*, Econométrica N° 50, pp. 1345-70.

Koo, Richard
2008 *El Santo Grial de la Macroeconomía - Lecciones de la Gran Recesión de Japón*, John Wiley & Sons.

Lane, Philip
2001 *The New Open Economy Macroeconomics: a Survey*, Journal of International Economy, Vol. 54, N° 2001, pp.235-266.

Long, John y Charles Plosser
1983 *Real Business Cycles*, Journal of Political Economy, N° 91, pp 31-69

Lucas, Robert.
1972 *Expectations and the Neutrality of Money*, Journal of Economic Theory, N° 4, pp.103-124.
1975 *An Equilibrium Model of the Business Cycle*, Journal of Political Economy
Vol. 83, N°. 6, pp. 1113-1144.
1976 *Econometric Policy Evaluation: A Critique",* Carnegie-Rochester Conference Series on Public Policy, Vol. 1, pp. 19-46.
1987 *Studies in Business-Cycle Theory*, MIT Press.
1988 *On the Mechanics of Economic Development*, Journal of Monetary Economics No. 22, pp. 3-42.
2003 *Macroeconomic Priorities*, American Economic Review vol. 93, N° 1, pp 1-14

Lucas, Robert y Nancy Stokey
1983 *Optimal Fiscal and Monetary Policy in an Economy Without Capital*", Journal of Monetary Economics, N° 12, pp 55 – 93.

Mankiw, Gregory
1985 *Small Menu Costs and Large Business Cycles: A Macroeconomic Model of Monopoly*, Quarterly Journal of Economics, 100, pp 529 – 537.
1989 *Real Business Cycle: A New Keynesian Perspective*, Journal of Economic Perspectives, 3, pp 79-90
1990 *A Quick Refresher Course in Macroeconomics*, Journal of Economic Literature Vol. XXVIII, pp. 1645-1 660
1991 *New Keynesian Economics*, Cambridge, Massachusetts: MIT. Press.
1995 *The Growth of Nations*, Brookings Papers on Economic Activity No. 1, pp. 275-310.
2006 *The Macroeconomist as Scientist and Engineer*, Journal of Economic Perspectives, Vol. 20, N° 4, pp. 29-46.

Mankiw, Gregory, Romer, David y David Weil
1992 *A Contribution to the Empirics of Economic Growth*, The Quarterly Journal of Economics, N° 107, pp. 401-437.

Martin, Philippe y Carol Rogers
2000 *Long-Term Growth and Short-Term Economic Instability*, European Economic Review N° 44, pp. 359-381.

Maskin, Eric
2009 *Eric Maskin on Economic Theory and the financial crisis*, entrevista a Eric Maskin en The Browser, octubre.

Meade, James.
1951 *The Balance of Payments*, Oxford University Press.

Mendoza, Waldo y Pedro Herrera
2006 *Macroeconomía. Una marco de análisis para una economía pequeña y abierta*, Fondo Editorial de la PUCP, Lima.

Miller, Preston
1994 *The Rational Expectations Revolution: Readings from the Front Line*, Cambridge, MA: MIT Press.

Modigliani, Franco y Richard Brumberg
1954 "Utility Analysis and the Consumption Function: an Interpretation of Cross-Section Data"*,* en *Post-Keynesian Economics*, Rutgers University Press.

Modigliani, Franco y Albert Ando
1963 *The Life Cycle Hypothesis of Saving: Aggregate Implications and Tests*, American Economic Review, Vol. 53, Nº 1, pp 55-84.

Mundell, Robert
1960 *The Monetary Dynamics of International Adjustment under Fixed and Flexible Exchange Rates,* Quarterly Journal of Economics, N° 74, pp 227- 257.
1961 *A Theory of Optimum Currency Areas*, American Economic Review 51, pp. 657-665.
1963 *Capital Mobility and Stabilization Policy Under Fixed and Flexible Exchange Rates*, Canadian Journal of Economics and Political Science, Vol. 29, pp. 475-485.
1968 *International Economics,* Macmillan, New York.
1971 "Movilidad de capital y política de estabilización con tipos de cambio fijos y con tipos de cambio flexibles", en Caves Richard y Harry Johnson (compiladores), *Ensayos de Economía Internacional*, Amorrortu editores, Buenos Aires.

Muth, John
1961 *Rational Expectations and the Theory of Price Movements*, Econométrica, N° 39, pp. 315-334.

Obstfeld, Maurice.
1992 *International Capital Mobility in the 1990s,* NBER Working Paper Series N°. 4534.

1999 "Foreign Resource Inflows, Saving, and Growth", en Schmidt-Hebbel and Serven (editores), *The Economics of Saving and Growth. Theory, Evidence, and Implications for Policy* pp 107-146.
2001 *International Macroeconomics: Beyond the Mundell-Fleming Model*, NBER Working Paper Series N°. 8369.

Obstfeld, Maurice y Kenneth Rogoff
1994 *The Intertemporal Approach to the Current Account*, NBER Working Paper N° 4893.
1996 *Foundations of International Macroeconomics*, The MIT Press.

Obstfeld, Maurice y Alan Taylor
1999 *The Great Depression as a Watershed: International Capital Mobility Over the Long Run*, NBER Working Paper Series N° 5960.

Ostry, Jonathan; Ghosh, Atish y Anton Korinek
2012 *The Liberalization and Management of Capital Flows: An Institutional View*, IMF Staff Discussion Note, SDN/12/10, September 7.

Ostry, Jonathan; Ghosh, Atish y Marcos Chamon
2012 *Two Targets, Two Instruments: Monetary and Exchange Rate Policies in Emerging Market Economies,* IMF Staff Discussion Note SDN/12/01, February 29.

Phillips, William
1958 *The Relation between Unemployment and the Rate of Change of Money Wages Rates in the United Kingdom, 1861-1957,* Economica, Vol. 25, N° 100.

Parkin, Michael
1986 *The Output-Inflation Trade-off when Prices are Costly to Change*, Journal of Political Economy, N° 94, pp 200-224.

Phelps, Edmund
1967 *"Phillips Curves, Expectations of Inflation and Optimal Unemployment Over the Time*", Economica, 34, pp 254-281.

Phelps, Edmund y John Taylor.
1977 *Stabilizing Powers of Monetary Policy under Rational Expectations*", Journal of Political Economy, N° 85, pp. 163-190.

Phillips, Alban.
1958 *The Relation Between Unemployment and the Rate of Change of Money Wages in the United Kingdom*, *1861-1897*, Económica, pp 283 – 299.

Polak, Jacques
1957 *Monetary Analysis of Income Formation and Payments Problems*", Staff Papers, International Monetary Fund, Vol. 6, pp 1 – 50.

1995 *Fifty Years of Exchange Rate Research and Policy at the International Monetary Fund*, Staff Papers, International Monetary Fund, N° 42, pp 734-761.

Prescott, Edward
1986 *Theory Ahead of Business Cycle Measurement*, Federal Reserve Bank of Minneapolis Quarterly Review: 1986, No 102.

Real Academia Sueca de Ciencias
2004 *Finn Kydland and Edward Prescott's Contribution to Dynamic Macroeconomics: The Time Consistency of Economic Policy and the Driving Forces Behind Business Cycles*, Advanced information on the Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel.

Ricardo, David.
1973 *Principios de Economía Política y Tributación*, Segunda Reimpresión, Fondo de Cultura Económica, México.
1981 "On The Principles of Political Economy and Taxation"*, en* Sraffa, P. *The works and correspondence of David Ricardo*. Cambridge: Cambridge University Press.

Rogerson, Richard
1988 *Indivisible Labor, Lotteries and Equilibrium*, Journal of Monetary Economics, Vol. 21, pp 3 -16.

Rogoff, K.enneth
1985 *The Optimal Degree of Precommitment to an Intermediate Monetary Target*", Journal of International Economics, N° 18, pp. 1169-1190.

Romer, Paul.
1990 *Endogenous Technological Change*, Journal of Political Economy Vol. 98, N° 5, pp S71 – S102.

Ruff, Daniel y Lawrence Summers
1987 *Did Henry Ford Pay Efficiency Wages?*, Journal of Labor Economics, Vol. 5, pp S57 – S86.

Samuelson, Paul
1955 *Economics*, tercera edición, McGraw-Hill, USA.

Samuelson, Paul y Robert Solow
1960 *Analytical aspects of anti-inflation policy*. American Economic Review, May 1960, N° 50, pp. 174-84.

Sargent, Thomas
1972 *Rational Expectations and the Term Structure of Interest Rates*, Journal of Money Credit and Banking, N° 4, pp 74-97.

Sargent, Thomas y Neil Wallace
1975 *Rational Expectations, the Optimal Monetary Instrument and the Optimal Money Supply Rule"*, Journal of Political Economy, N° 83, pp 241 – 254.

Shapiro, Carl y Joseph Stiglitz
1984 *Equilibrium Unemployment as a Worker Discipline Device*, American Economic Review, N° 74, pp. 433-444.

Shleifer, Andrei
1986 *Implementation Cycles*, Journal of Political Economy, N° 94, pp. 1163-1190.

Spilimbergo, Antonio; Symansky, Steve; Blanchard, Olivier y Carlo Cottarelli
2008 *Fiscal Policy for the Crisis*, IMF Staff Position Note SPN/08/01, December 29.

Stiglitz, J. E.
1986 "Theories of Wage Rigidities", *Keynes´ Economic Legacy: Contemporary Classic Theories*, editado por J.L. Butkiewicz, Praeger, New York.

Stiglitz J. y Weiss, A.
1981 *Credit Rationing in Markets with Imperfect Information*, American Economic Review, N° 69, pp. 793-410.

Solow, Robert
1956 *A Contribution to the Theory of Economic Growth*, Quarterly Journal of Economics, Vol. 70, N° 1 pp. 65-94.
1956 *Technical Change and the Aggregate Production Function*, Review of Economic and Statistics N°. 39, pp. 312-20.
1979 *Another Possible Source of Wage Stickness*, Journal of Macroeconomics, Vol. 1, pp. 79-82.
2008 *Comments*, Journal of Economic Perspectives, Vol. 22, N° 1, pp.243-249.

Summers, Lawrence
1986 *Some Skeptical Observations on Real Business Cycle Theory*, Federal Reserve Bank of Minneapolis, Quarterly Review, N° 10.

Svensson, Lars y Sweder van Wijnbergen
1989 *Excess capacity, monopolistic competition and international transmission of monetary disturbances*, Economic Journal N° 99, pp. 785–805.

Tabellini, Guido
1985 *Accommodative Monetary Policy and Central Bank Reputation*, Giornali degli Economistie Annali di Economia, N° 44, pp. 389-425.

Taylor, John
1979 *Staggered Wage Setting in a Macro Model*, American Economic Review, N° 69, pp. 108-113.
1993 *Discretion Versus Policy Rules in Practice,* Carnegie-Rochester Conference Series on Public Policy N°. 39, pp. 195-214.

Tobin, James
1956 *The Interest-Elasticity of the Transactions Demand for Cash*, Review of Economics and Statistics Statistics pp 241 – 247.
1969 *A General Equilibrium Approach to Monetary Theory*, Journal of Money, Credit and Banking N° 1, pp. 15-29.

Usubiaga, Carlos
2002 *El Estado actual de la Macroeconomía*, Prensas Universitarias de Zaragoza, Madrid.

Wickens, Michael
2011 *Macroeconomic Theory. A Dynamic General Equilibrium Approach*, segunda edición, Princeton University Press, Princeton.

Woodford, Michael
2003 *Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton University Press, Princeton
2009 *Convergence in Macroeconomics: Elements of the New Synthesis*, American Economic Journal: Macroeconomics, Vol. 1, N° 1, pp 267-279

Yellen, Janet
1984 *Efficiency Wage Models of Unemployment*, American Economic Review, N° 74, pp 200-205.

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Libros

Cecilia Garavito e Ismael Muñoz (Eds.)
2012 *Empleo y protección social.* Lima, Fondo Editorial, Pontificia Universidad Católica del Perú.

Félix Jiménez
2012 *Elementos de teoría y política macroeconómica para una economía abierta* (Tomos I y II). Lima, Fondo Editorial, Pontificia Universidad Católica del Perú.

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2012 *Crecimiento económico: enfoques y modelos.* Lima, Fondo Editorial, Pontificia Universidad Católica del Perú.

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2010 Biocomercio en el Perú: Experiencias y propuestas. Lima, Escuela de Posgrado, Maestría en Biocomercio y Desarrollo Sostenible, PUCP; IDEA, PUCP; y, LATN.

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