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ne@face.ufmg.br

Universidade Federal de Minas Gerais  
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Pedrosa, Ítalo; Farhi, Maryse  
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# Macroeconomic theory in the aftermath of the crisis:

mainstream and new Keynesianism

Ítalo Pedrosa\*

Maryse Farhi\*\*

## Palavras-chave

Novos keynesianos,  
Teoria Macroeconômica,  
Mainstream, Política  
macroeconômica,  
Novo Consenso  
Macroeconômico

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B22, E60, E61

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*New Keynesians,  
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\*Doutorando do Instituto de  
Economia da Universidade  
Estadual de Campinas (UNICAMP),  
Campinas. Bolsista do CNPq – Brasil.

\*\*Professora Doutora do Instituto  
de Economia da Universidade  
Estadual de Campinas  
(UNICAMP), Campinas.

## Resumo

A falha do mainstream da teoria macroeconômica em fornecer um conjunto adequado de instrumentos para entender e combater a crise econômica desencadeou um debate entre os teóricos da tendência dominante sobre os próprios fundamentos e sobre as políticas macroeconômicas adequadas. O objetivo deste trabalho é investigar em que medida a crise teve consequências para as teorias e as recomendações de políticas macroeconômicas do mainstream. Argumentamos que os novos keynesianos não passaram incólumes pela crise, eles próprios reconhecendo a necessidade de adaptar seus modelos para a realidade observada. A principal mudança é o reconhecimento da não neutralidade do sistema financeiro, que coloca em questão a política monetária guiada por um instrumento, a taxa de juros de curto prazo, uma meta, a taxa de inflação, que seriam insuficientes para simultaneamente levar a um crescimento estável e próximo do potencial e manter a estabilidade do sistema financeiro.

## Abstract

*The failure of mainstream macroeconomics to provide a suitable set of instruments to understand and fight against the economic crisis has triggered a debate among the dominant theoretical tendency, on its own foundations and on the macroeconomic policy that should be implemented after the crisis. The aim of this paper is to investigate to what extent the crisis affected mainstream macroeconomic theory and policy guidelines. We argue that new Keynesians did not pass unharmed by the crisis, themselves acknowledging the need to adapt their models through the incorporation of new variables and ideas. The main change is the recognition of the non-neutrality of the financial system, which calls into question monetary policy guided by one instrument, the short-term interest rate, and by one target, the inflation rate, which would be insufficient to simultaneously lead to a stable and near potential output growth while maintaining the stability of the financial system.*

## 1\_ Introduction

Throughout the economic crisis that started in the United States in 2007, governments have had to use various policy instruments that, until recently, were considered unsuitable by mainstream economists. As a secondary effect of the crisis, a debate about macroeconomic theory and policy was triggered within the mainstream. In February 2010, the IMF published a paper entitled “*Rethinking Macroeconomic Policy*” (Blanchard *et al.*, 2010), signed by the chief economist (at the time of writing, July 2012) of the institution and two other IMF staff members, which stated that several of the pre-crisis policy guidelines, usually recommended as solid macroeconomic policy, had significant flaws or even were not correct. This paper intends to investigate to what extent the crisis has had consequences for mainstream theory and its normative aspect, that is, the recommended macroeconomic policies.

We argue that, more than just discussions, there is evidence that a change is occurring within mainstream theory, driven primarily by new Keynesians. That is, they, who were already the dominant school within New Consensus Macroeconomics, have led the reform process of their own models and have already incorporated some new dimensions into their core research. The financial and banking system is being considered in various forms in the dynamic stochastic general equilibrium models and some discussion on fiscal policy has come back to their research agenda. The explicit incorporation of financial systems opens room for the possibility of regulatory policies, somehow changing the macroeconomic policies framework in vogue prior to the crisis. On fiscal policy, despite the revival of the discussion, there are methodological problems and less convergence on theory.

We are less concerned here with explaining the origins of the crisis, as our focus is on the changes brought by it within mainstream macroeconomics. Nonetheless, as these changes are a result of the interaction between the facts and the way one interprets them, we will, whenever needed, discuss aspects of the crisis interpreted from a new Keynesian perspective. Additionally, we are focusing on theoretical changes triggered by the crisis, not on policies that were actually enacted in response to it.

Besides this introduction, this paper is composed of four sections. In section 2, we present the macroeconomic theoretical framework and the derived policies which constitute a standard model for policy makers in the pre-crisis context. We start with a brief description of the ideas of New Consensus Macroeconomics, arguing that new Keynesians provide the final form of its models. The description will cover mainstream monetary policy, within an inflation targeting regime, and fiscal policy.

In section 3, we review some papers published by important new Keynesians after the worsening of the crisis, in which flaws in the new Keynesian normative model were recognized and the new dimensions of macroeconomic theory in the mainstream framework were proposed. In section 4, an overview of the changes in the dominant thinking will be made so that, in the conclusion, we may discuss the hypothesis that there is ongoing change within mainstream theory and that the dominant thinking in this new framework will continue to be new Keynesian.

## 2\_ New Keynesian policies framework before the crisis

Since the 80s, mainstream research has moved towards a compromise between new classical and new Keynesian economics, based on the use of some new classical theoretical concepts and methodology by the new Keynesians, adding alternative hypotheses and market failures into the models. With this theoretical framework, a set of essentially new Keynesian macroeconomic ideas has been composed, from which some “optimal” macroeconomic policies have resulted. They were usually recommended by a great number of economists and by a variety of institutions that are part of the economic establishment. The resultant set of ideas that have become today’s mainstream is usually called New Consensus Macroeconomics (NCM)<sup>1</sup>.

NCM is the macroeconomic mainstream<sup>2</sup> as it dominates the research, is taught in most of the top universities, receives funding from many important research foundations and has been recently awarded the Nobel Prize. The new Keynesians, in turn, are the most recent dominant school of thought within the mainstream. As a consequence, much of the research and the operational practice of central banks and governments is based on the principles propagated by them, particularly since the 90s. In this paper, we consider as new Keynesians those who have made some contribution with a particular set of methodologies that characterize this school, as defined below.

In general, the new Keynesian models are the final form in which models appear within NCM. They were developed from the basic real business cycle (RBC) model into a Walrasian general equilibrium, in a representative agent and rational expectations framework<sup>3</sup>, but under some alternative assumptions. Instead of starting from

a model with perfect competition, with complete and freely available information, without externalities and other market imperfections, such as the RBC models, there are versions of new Keynesian models adopting monopolistic competition, asymmetric information, nominal prices (and wages) stickiness, also considering the possibility of other market imperfections. So, the new Keynesians<sup>4</sup> reject the idea of continuous market clearing, through the incorporation of some market frictions, showing that Sargent and Wallace’s (1975, 1976) conclusion about the ineffectiveness of macroeconomic policies comes from the adoption of this hypothesis, not from the incorporation of rational expectations.

According to Clarida *et al.* (1999) and Blanchard (2008), the canonical new Keynesian model is composed of three equations:

- an aggregate demand relation, as follows

$$y_t - y_n = -\varphi(i_t - E_t \pi_{t+1}) + E_t(y_{t+1} - y_n) + g_t \quad (1)$$

where  $y_t - y_n$  is the output gap,  $E_t$  represents the expected value in period  $t$  for the period  $t+1$ ,  $i_t$  is the nominal interest rates in  $t$ ,  $\pi_{t+1}$  is the inflation in  $t+1$ ,  $y_{t+1} - y_n$  is the output gap expected for  $t+1$  and  $g_t$  is a disturbance term. In this relation, the output depends on the demand and the demand depends on the anticipation of future output and on the future real interest rate. The real interest rate is important to determine present consumption due to representative agents’ intertemporal utility maximization which, in turn, reflects an expected opportunity cost of present consumption in terms of future consumption.

- a Phillips curve

$$\pi_t = \lambda(y_t - y_n) + \beta E_t \pi_{t+1} + u_t \quad (2)$$

where  $(y_t - y_n)$ ,  $E_t$  and  $\pi_{t+1}$  are defined as in equation 1,  $\pi_t$  is the current inflation and  $u_t$  is a disturbance term. Thus, the present inflation depends both on the current output and the expected inflation. This relation is valid only for the short-term since, in the long-term, the output depends on supply conditions.

- a monetary policy relation (Taylor rule), which should be used to find the appropriate interest rate to keep inflation on target, given a particular output gap. The first version of the Taylor rule can be described as

$$r - r^* = a(\pi - \pi_M) + b(y_t - y_n) \quad (3)$$

where  $r$  is the real interest to be pursued,  $r^*$  is the neutral real interest rate,  $(\pi - \pi_M)$  is the deviation of current inflation relative to the target inflation,  $a$  is the coefficient that reflects the sensibility of interest to inflation variations and  $b$  is the coefficient that reflects the sensibility of interest to variations in the output gap. The neutral real interest rate and the natural output, which are actually estimated variables, are assumed to be known. From the Taylor rule, the inflation targeting regime emerged and imposed itself as a means to manage the agents' expectation of inflation.

Although there are a variety of new Keynesian models, the main normative aspects are captured in this simplified model. Explicitly and implicitly, the main conclusions about the best macroeconomic policy that should be adopted are included within.

After this brief statement on the theoretical basis that led to NCM, backed by a model which uses the RBC methodology with alternative hypotheses, namely, the possibility of market frictions, the mainstream policy recommendations will be discussed.

## 2.1\_ Monetary policy

Assuming that inflation has many costs<sup>5</sup> and that, through the Phillips curve, its stability is a condition to keep output growing by its potential in the long-term, the inflation targeting regime was developed. This theoretical framework leads to the belief that central banks' main target when formulating monetary policy is to keep prices relatively stable. With that purpose, central banks need to have autonomy in the conduction of monetary policy.

Inflation stability, in this model, is more than a condition of existence: it guarantees an output growth very near to its potential<sup>6</sup>. For the purpose of keeping inflation low and stable, the monetary authorities must act in order to create a nominal anchor, i.e., looking for convergence in agents' expectations of inflation to a determined point, band or target. As the inflation targeting regime supposes both the independence of the central bank and its focus on price stability, eventually the inflation expectation of the agents will be the target itself, if the central bank has a history of credible policies. The desirable preconditions to adopt this policy framework are, as reported by Farhi (2007): institutional independence of central banks; well-developed technical infrastructure; totally unregulated prices, as well as low sensitivity to commodity prices and exchange rate shocks; the financial system should be healthy; and, there can be no fiscal dominance.

This model has been adopted in several countries, explicitly in some and implicitly in others. Inflation

targeting's degree of rigidity, which increases or reduces the potential impact on other macroeconomic variables, depends on how the model is implemented, as suggested by Bernanke and Mishkin (1997): the definition of the target as a band and not a fixed point; the kind of price index used as a target; and the time horizon to reach the desired level of inflation.

The short-term interest rate (usually the overnight rate) was considered the only monetary policy instrument. Its transmission occurs, as argued by the inflation targeting theorists, through the interest rates of the banks and financial markets and through the asset prices, not by the monetary aggregates (Blanchard *et al.*, 2010). In theory, the assets were linked through arbitrage, so the risk remuneration was negotiated in each contract. In this case, because of the arbitrage, it makes sense to have a short-term interest rate as the sole instrument of monetary policy, assuming a key feature of the new Keynesian models, the money endogeneity.

## 2.2\_ Financial Markets and Regulation

Financial markets were treated like a veil that covered the real economy, taking no central role in NCM modeling, with few papers addressing the subject<sup>7</sup>. Under the assumption that the short-term interest rate is linked with other asset prices through the principle of arbitrage and that the real effects of monetary policy take place through interest rates and asset prices, financial intermediation would have no macroeconomic relevance except for the credit channel of commercial banks (Blanchard *et al.*, 2010). Some aspects, such as the agents' leverage or excessive exposure to one type of market, should not be considered when managing monetary policy.

Therefore, financial regulation was not considered a macroeconomic policy tool, and was focused on banking

institutions (micro-prudential) rather than on the markets (macro-prudential), with the aim of correcting flaws that arise from information asymmetry or other imperfections. In other words, as stated by Borio (2011), the risks were treated as “*exogenous with respect to the behavior of each individual institution and of all institutions taken as a group*”, as the “*asset prices, credit conditions and the macroeconomy are regarded as independent of the collective behavior of financial firms*”.

## 2.3\_ Fiscal policy

Solow (2002) affirms that

*serious discussion on fiscal policy has almost disappeared. A reading of the literature on macroeconomic theory and policy would lead you to believe that [...] fiscal policy is either impossible or undesirable or both.*

There are several reasons why this specific treatment has emerged: first, one feature of the new classical revolution consisted of denying the discretionary fine-tuning defended by the neoclassical synthesis until the mid-70s, at that time the mainstream of economics. There is no doubt that this historical element contributed to today's virtual absence of fiscal policy in NCM. Second, unlike monetary policy, about which it is possible to create a technical rule to theoretically free the policy makers from political constraints, it is much harder to develop a mechanism for fiscal policy that meets the need to break the discretionary character prevalent in public spending. Third, as stated by Blanchard (2008), the dynamic stochastic general equilibrium (DSGE) model's structure makes it difficult to work with fiscal policy without stepping outside of this specific kind of model. Some of the reasons for that may be, for example, the fact

that because the model is designed from a representative household perspective without differentiating public and private spending, and includes only monetary policy variables such as short-term interest rates, it cannot adequately deal with fiscal policy issues.

Regarding the theoretical arguments about fiscal policy, there is less convergence in the NCM framework compared with monetary policy, even though we can find some common elements. In a broader sense, the norm was to defend a neutral fiscal policy, trying not to interfere in monetary policy (which would reduce its effectiveness) and avoiding fiscal dominance. For Blanchard *et al.* (2010), there are a number of arguments used to justify neglecting its role as a central policy instrument. The main ones are:

- skepticism about its effectiveness based on Ricardian equivalence arguments. This hypothesis states that fiscal policy is not able to produce effects on economic activity in the short-term, as it does not affect the households' permanent income. A tax reduction financed by debt does not affect households' permanent income, as the debt payment flows present a value that is expected to be equal to the value of the bond, which is, in turn, the same value as the tax reduction (there is no change in income)(Blinder, 2006, p. 9);
- monetary policy is able to keep output growth stable, so there is no reason to use another instrument;
- the time gap before fiscal policy can be put in place is high compared to the short duration of recessions (long internal lag);
- fiscal policy, much more than the monetary policy, is subject to political distortions.

Based on these arguments, NCM ignored fiscal policy as a convenient instrument of countercyclical policy. On the one hand, they accepted the possibility of creation and operation of mechanisms within the public account, which could work as a countercyclical tool – as automatic stabilizers. On the other, they found it useful to turn to expansionary fiscal policy in case of a great shock, when monetary policy reaches its limits, in economies with difficulties in growing and escaping from deflationary risks.

### **3\_ Crisis' lessons and the post-crisis new Keynesian policy framework**

The subprime crisis allowed the serious flaws within the NCM architecture models to become clearer and to be criticized, as they could not provide proper policy tools to react to the Global Financial Crisis. More than a statement of historically critical schools of thought, new Keynesians themselves recognized many flaws in their ideas, intensifying the search for answers to the new questions. In this section, we intend to show, from a meaningful sample of new Keynesian standpoints, that for them, with few (but not necessarily easy) incremental changes, their models can be fixed. We develop this discussion through the revision of recent new Keynesian publications about the aspects in which the models failed and what lessons could be learned, and we discuss whether and how these lessons are being incorporated into macroeconomic theory.

The crisis began in mid-2007 after the increase in subprime mortgage defaults in the United States, in particular after the Lehman Brothers' bankruptcy, and spread around the world causing restrictions in the interbank market and a sharp increase in risk aversion in global financial markets. The productive sector was

suddenly affected due to the deterioration in expectations, the credit crunch, the demand contraction and the rise in unemployment. From then on, the crisis acquired systemic features and policy makers used more creative and incisive measures, exposing a more cleanly cut rift between mainstream theories and macro policy.

From a theoretical perspective, Blanchard *et al.* (2010) assert that, although many flaws could be found, the main elements and conclusions of the pre-crisis consensus still hold. Thus, the natural rate notion should remain and policy makers should not assume a long-term trade-off between inflation and unemployment. Nevertheless, they recognize that inflation (or core inflation) stability, as well as the output gap, should remain as final targets of macro policy, though they are insufficient to design monetary policy.

Otherwise, the crisis has shown three essential problems within new Keynesian macroeconomics. First, with inflation established at around 2% in developed countries, nominal short-term interest rates are settled at a very low level. In this case, if there is a need to ease monetary policy, as in the recent crisis, the nominal interest rate rapidly meets its zero lower bound, a liquidity trap<sup>8</sup> situation. If the inflation and nominal interest rate levels were raised, the scope of monetary policy would be increased. So, a solution would be to set up a higher inflation target, of around 4%, as a way to keep nominal interest rates higher. However, this new framework would potentially bring a new kind of problem, namely, a higher volatility of inflation and wage indexation (Blanchard *et al.*, 2010, p. 11); this, in turn would increase output growth and reduce the power of monetary policy.

Secondly, in reference to the potential relevance of fiscal policy as a countercyclical tool, from the moment

that monetary policy and quantitative easing reach their limits, the crisis is expected to be prolonged. In this circumstance, the internal lag of fiscal policy would not be a barrier to public spending expansion. On the other hand, another fiscal question that arose after the States' actions to avoid a meltdown of the financial markets is linked with the strong rise both in public deficit and debt. The lack of fiscal space prevented the expansionary measures from going further, so it would be largely desirable to address this problem after the crisis in order to create fiscal space. That means that fiscal policy should be countercyclical over both expansion and contraction, creating room to use this anti-crisis tool without excessive deterioration of public accounts.

The third problem that became clear is the assumption of non-neutrality of financial markets and regulation in macroeconomic terms. The removal of legal limitations on the actions of financial institutions offered incentives to regulatory arbitrage, the creation of Special Investment Vehicles and other financial conduits (seemingly independent companies with off-balance sheet results), allowing them to avoid some prudential rules and leading to excessive risk taking and leverage. Based on that experience, Blanchard *et al.* (2010) admit that non-commercial banks and financial institutions are relevant agents for determining or spreading the financial crisis. This opens room for central banks to act as a lender of last resort in case of lack of liquidity, in order to avoid a deflationary spiral or infection of the financial system.

Thus, to deal with problems such as agents' leverage and deviations of prices of assets' from fundamentals, the short-term interest rate is not the most appropriate instrument, as it negatively affects the output gap. Whereas regulation should no longer be seen as

macroeconomically neutral, the solution would be to combine interest rate policy with regulatory policy, the former addressing aggregate variables and the latter specific problems. This combination would increase the typical monetary policy range with the flexibility of regulation.

In this potentially different theoretical framework, a major problem in designing the macroeconomic policy would be the need to have many targets (Blanchard *et al.*, 2010, p. 10). The recent discussions have been organized around these multiple targets.

Regarding monetary policy, none of the changes of inflation targets suggested by Blanchard and his colleagues were actually carried out – because the focus now is the resumption of growth and the fiscal issue. The most recent mainstream economists' publications still maintain the standards observed in the pre-crisis structure. The main issues are the effectiveness of monetary policy on maintaining inflation and the output gap at stable and optimal levels, using the same DSGE models for simulation of alternative macroeconomic policies.

On monetary policy, some new Keynesians incorporated some of the criticism of Blanchard *et al.* (2010). A more conservative approach can be represented by Taylor (2009a, 2009b, 2010b, 2010a), for whom the government interventions, both after and during the crisis, “*did more harm than good*” (Taylor, 2010b, p. 175). Even though he now recognizes a flaw in the pre-crisis consensus, namely because the financial dimension was largely ignored in the normative model, he considers that the policy errors worsened the crisis. The basic argument is that, before the crisis, the real interest rates were kept, for a long time, below that required by the Taylor rule. This led the agents to a greater need for leverage – to maintain their profits levels – and worsened the negative

effects of the United States' housing market boom.

The agents took more risk and the increased foreclosures intensified the financial institutions' balance sheet deterioration.

The policies were more interventionist during the crisis. This, combined with a misdiagnosis of the nature of the problem, led to inadequate actions being taken. According to Taylor, the problem that arose in the financial market, especially in the interbank market, was not a liquidity problem but a counterparty risk, caused by the large number of junk bonds in financial institutions' portfolios and the consequent loss of equity. In the financial system, only after the announcement that the Troubled Asset Relief Program (TARP) funds would be used to inject equity into banks rather than just buying bad assets, the interbank spread reversed its upward trend – which in Taylor's view corroborates that the counterparty risk was causing market dysfunction<sup>9</sup>.

In short, imbalances were caused because macroeconomic policy deviated from the optimal scenario, as the policies became more interventionist, less rule-based and less predictable than before (Taylor, 2010b). From a normative point of view,

*For monetary policy, it means [...] returning to a policy with four basic characteristics (Taylor, 2010a): “First, the short-term interest rate (the federal funds rate) is determined by the forces of supply and demand in the money market. Second, the Fed adjusts the supply of money or reserves to bring about a desired target for the short-term interest rate; there is thus a link between the quantity of money or reserves, and the interest rate. Third, the Fed adjusts the interest rate depending on*

*economic conditions: the interest rate rises by a certain amount when inflation increases above its target and the interest rate falls by a certain amount when the economy goes into a recession. Fourth, to maintain its independence and focus on its main objectives of inflation control and macroeconomic stability, the Fed does not allocate credit or engage in fiscal policy by adjusting the composition of its portfolio toward or away from certain firms or sectors”*

(TAYLOR, 2010B, P. 175).

John Taylor is a leading example of a new Keynesian author that defends the pre-crisis paradigm for macroeconomic policy, with monetary policy based on rules combined with a non-active fiscal policy. However, at the peak of the crisis, he also suggested introducing the spread of the financial system into the Taylor rule, which therefore would affect short-term interest rates differently from the traditional method<sup>10</sup> (Taylor, 2008, p. 4).

Another approach is used by Cúrdia and Woodford (2010), also admitting a failure to take into account the financial system while formulating monetary policy and, from that, redesigning the new Keynesian model.

The traditional new Keynesian model used to consider a sole representative household to obtain the aggregate demand relation (Equation 1). In this case, the financial intermediation would have no influence on the determination of equilibrium since individuals were not differentiated as savers and borrowers. The first change proposed by Cúrdia and Woodford (2010) consists of a model extension to the case where there is heterogeneity in the preferences.

Models with these kinds of heterogeneous agents existed before the crisis but, due to easier tractability of

the sole representative agent, they were not widely used. An example of a heterogeneous agents model comes from Mankiw (2000) (Arestis, 2009). He considers the possibility of the existence of Ricardian agents able to smooth intertemporal consumption, and non-Ricardian agents which follow a rule of thumb to decide how much to consume and do not have access to asset markets, simply consuming their disposable income. In such a model, the presence of non-Ricardian agents amplifies the effects of fiscal policy.

Cúrdia and Woodford's model is constructed in the spirit of the abovementioned Mankiw's paper, as it considers only two kinds of households: one, more impatient, which prefers to consume more at the present than in the future; and the other, which prefers to save at the present in order to consume more in the future. There is, thus, an important space for financial intermediation, through the credit market interest rate, in the determination of aggregate demand.

The incorporation of heterogeneity and the possibility of financial market frictions in their model have some implications for monetary policy. It continues to be built under an inflation targeting regime, with the main focus on the stability of inflation (on target), but gaining new dimensions. The interbank spread is included in the model, although not in exactly the same way as proposed by Taylor (2008)<sup>11</sup>. Similarly, the central bank balance is also incorporated into the model. The central bank's reserve policy (quantitative easing) should be based on a simple rule: financial

*intermediaries should be satiated in reserves at all times, by maintaining an interest rate on reserves at or close to the current target for the policy rate*

(Cúrdia and Woodford, 2010, P. 261-2).

In turn, central bank credit policy should only be used in less common situations, when credit frictions are noted. In this framework, in normal times, the short-term interest rate remains the main monetary policy instrument and the financial variables need not to be taken as a primer on monetary policy targets, but should be monitored. In short, the authors argue, in agreement with Blanchard *et al.* (2010), that

*One of our most important conclusions is that these issues can be addressed in a framework that represents a straightforward extension of the kind of model often used for monetary policy in the past.* (Cúrdia and Woodford, 2010, P. 261)

Other studies deal with the non-neutrality of the financial system, most of them incorporating the impact of credit and banking on macroeconomic welfare and its impact on monetary policy. The inclusion of the non-neutrality of the financial system is diverted into regulatory and financial system supervision, which can be performed in two distinct ways. In the first, the focus is on micro-prudential issues, aiming to force the banks to internalize any eventually generated losses, in order to protect the deposit insurance providers, and to reduce the moral hazard; in the second, from a macro-prudential point of view, the regulation effort is to control social costs associated with the shrinkage and loss of value of multiple financial institutions' assets during a systemic shock (Hanson *et al.*, 2011, p. 2-4).

Before the crisis, the regulation was constructed with a focus on the micro-prudential dimension, largely based on the idea of the neutrality of the financial system and regulation, and intended to prevent financial institutions from going bankrupt. The belief that the self-regulation of financial institutions would be sufficient relied on

the assumption that those most interested in remaining healthy were the institutions themselves, so they would manage the assumed risks in the best way.

Meanwhile, the huge financial institutions' and insurance companies' losses, which assumed a very speculative position using OTC derivatives, and the Lehman Brothers' collapse, caused a freeze in the interbank market which, in turn, highlighted the non-neutrality of the financial system (including non-bank financial companies). Some of the most important practical new Keynesians have been recently concerned with the reconstruction of the regulatory apparatus, thus making the case for macro-prudential regulation, which in their view should be consistent with the degree of sophistication of the financial system and the potential macroeconomic impact it can exert. Namely, Olivier Blanchard, Ben Bernanke, at the time of writing the Fed chairman, and Alan Blinder, the Fed's vice-chairman during part of Clinton's administration, are among them. For instance, Blinder (2010) suggests some elements that must be present in a post-crisis regulatory framework, identifying major pre-crisis failures. The main lessons that should be learned are:

- the need for a systemic regulator: its task consisting of identifying and preventing risks, which are big enough or growing enough to cause systemic risks, from extending among different classes of institutions or markets. The problem, as pointed out by Blinder (2010), is to realize ex-ante that the problems are not restricted to one institution but refer to the system. Still, there is a lack of a more adequate methodology to this aim;
- a need for a solution to the too-big-to-fail and too-interconnected-to-fail institutions: these institutions were criticized for the moral hazard

they engendered since the government will, most likely, not let them collapse in case of huge losses. For this reason, they put a great volume of taxpayer funds at risk, besides the fact that they are in a unique position from the competitive point of view (access to cheaper funds);

- reforming the regulatory institutions and covering potential regulation gaps – as, for instance, the case of virtually unregulated OTC markets, Special Investment Vehicles (SIVs) and conduits that were left out of financial institutions' balance sheets;
- rationalizing CEO compensation, in order to avoid the incentives for excessive risk taking, as in the current remuneration scheme;
- rewriting the rules for the financial institutions' required equity, looking for a solution to the main problems within Basel agreements: the required level of capital is low and procyclical<sup>12</sup>; the regulation model cut too much weight in the rating of agencies and on bank risk management, combined with the existence of off-balance sheet entities allowed in the pre-crisis regulation framework.

Among academic economists, it is also possible to find some contributions revealing some concern with the non-neutrality of the financial system. Gertler *et al.* (2010) give a typically new Keynesian approach to micro-prudential regulation. They include in the model the possibility of macro-prudential policy to counterbalance the incentive for excessive risk taking by the banks. An important conclusion of theirs is that macro-prudential regulation increases society's welfare, which in the new Keynesian theoretical framework corresponds to an endorsement of new research in this area. Gerali *et al.*

(2010) estimate a DSGE model with credit and banking for the Euro Area, with one of their findings that “*banking may introduce additional volatility to the business cycle*”. Mendoza (2008) estimates a DSGE model with a mechanism by which the financial market motions a Fisherian debt-deflation that affects the real economy through Tobin's Q ratio, causing sudden economic stops. Christiano *et al.* (2010) estimate a DSGE model for the Euro Area and United States and find that

*agency problems in financial contracts, liquidity constraints facing banks, and shocks that alter the perception of market risk and hit financial intermediation – ‘financial factors’ in short – are prime determinants of economic fluctuations. They have been critical triggers and propagators in the recent financial crisis. Financial intermediation turns an otherwise diversifiable source of idiosyncratic economic uncertainty, the ‘risk shock’, into a systemic force.* (Christiano *et al.*, 2010, P. 4)

The new ideas inserted into the new Keynesian macroeconomic models reach some very similar conclusions to those proposed by Blanchard *et al.* (2010), and remain within new Keynesian guidelines. Even with the new endogenous and non-neutral framework for analyzing the financial system, monetary policy is generally intended to work as a technical instrument (non-discretionary), still seen as an efficient way to anchor expectations. It remains a policy designed to deal directly with aggregates, leaving more specific questions for another level (regulatory policy), although this point does not appear homogeneously in recent new Keynesian publications.

A relevant feature that remains unclear regarding macro-prudential policy theories is whether it will be treated as a distinct branch of study, not necessarily intended to be constructed into a DSGE framework – for instance, as done by Blinder (2010) –, or if it will be restricted to the incorporation of financial intermediation into the models, leaving aside the more specific problems related to the architecture of the financial system. Further, even if new Keynesians are seeking to incorporate the non-neutrality of the financial system into their monetary policy models, it is not clear whether those developments will be permanently incorporated into their core – or canonical – model.

For the fiscal policy, once the crisis began, it quickly became clear that it was much more intense than previous ones that occurred after the Second World War. Monetary policy was soon eased, but stumbled at the zero bound. It then became clear that it was necessary to resort to expansionist fiscal policy in order to strengthen aggregate demand. However, as Blanchard (2008, p. 11) acknowledges, the canonical new Keynesian model's structure may have influenced the way that fiscal policy theories were constructed:

*Because the model is clearly well designed to look at monetary policy, and also perhaps because central banks are rich institutions, with large research departments and conference money, there has been substantially more work on monetary policy than on fiscal policy.*

Current models do not seem to have solved these issues, and perhaps because issues on fiscal policy were highly neglected prior to the crisis, in the aftermath of the Global Financial Crisis much of the discussions

on that matter did not follow precisely the new Keynesian precepts.

In December, just after the Lehman Brothers' bankruptcy, Spilimbergo *et al.* (2008), members of the IMF's research department, published a paper in which they discussed the possible shapes that the fiscal policy should assume at that time, and its goals. They noted the need to recover the financial system's health as a *sine qua non* condition to stimulate and restore the aggregate demand recovery. Also, the fiscal stimulus should be

*Timely, (as there is an urgent need for action), large (because the drop in demand is large), lasting (as the recession will likely last for some time), diversified (as there is uncertainty regarding which measures will be most effective), contingent (to indicate that further action will be taken, if needed), collective (all countries that have fiscal space should use it given the severity and global nature of the downturn), and sustainable (to avoid debt explosion in the long run and adverse effects in the short run).* (Spilimbergo *et al.*, 2008, p. 3)

As well as Blanchard *et al.* (2010), they diagnose the crisis as a strong and potentially lasting one, hence rejecting the classical internal lag argument. By the time the text was published, the majority of developed countries was already at the lower bound interest rate, indicating the need for active fiscal policy. Spilimbergo *et al.*'s (2008) paper seems to be an open letter to the policy makers, containing a strong normative case<sup>13</sup> for the use of fiscal policy, without adopting a DSGE model.

As a consequence of the crisis, the public deficit widened in a colossal manner, as did the public debt. The global financial markets have responded in a

very adverse way to this scenario, increasing the risk premium over public debt through credit default swaps (CDS) –especially in some Euro Zone countries<sup>14</sup>, because they do not issue the currency in which their debts are denominated. In this context of fiscal deterioration, some new Keynesians, such as Taylor (Taylor, 2009a, 2010b, 2010a), revived arguments against fiscal activism and remained skeptical about fiscal effectiveness:

*For fiscal policy, this means avoiding further debt-increasing and wasteful discretionary stimulus packages, which do little to stimulate GDP. Ten years ago there was a near consensus that such programs were ineffective. Fiscal policy should focus on reducing the deficit and the growth of the debt-to-GDP ratio.* (Taylor, 2010b, p. 175)

His criticism on the active fiscal policy relies on the small multiplier effects of tax rebates, but greatly ignores the possibility that spending and public investment may have a greater multiplier effect. The ideas defended by Taylor (2000), that fiscal policy should focus on reducing public debt and should not interfere in monetary policy, seem to continue strong within mainstream economics. Taylor (2009b) maintains that fiscal policy, just as before the crisis, should be based on fiscal stabilizers, on structural reforms to improve supply conditions and should maintain a favorable path (decreasing or, at least, constant) of public debt<sup>15</sup>. In this scenario, the view that denies an active fiscal policy will be supported by an important group of new Keynesians, which were dominant before the crisis, seemingly without meaningful changes.

Taking a medium-term view, Blanchard (2010) argues that, although governments must demonstrate a credible project to withdraw fiscal stimulus and a way to return to

a sustainable public debt path, increasing growth in the short-term using fiscal spending is necessary. That means that, even having recognized the need to adjust public accounts in the medium-term, the IMF's chief economist admits that a fiscal contraction in order to achieve a public debt consolidation would be premature and that fiscal policy contributed in a decisive way to avoiding a further and worse output fall.

Regardless of personal opinions on the conclusions derived from the recent publications, the good news is that fiscal policy is now being seriously discussed again by mainstream macroeconomists. An important example is that in January, 2011, MIT hosted a meeting, called “*Economic Policy Challenges: Macroeconomics and Fiscal Policy*”, with MIT professors – and very important economists of the present day, such as Paul Krugman, Olivier Blanchard, N. Gregory Mankiw, Christina Romer, Robert Gordon and Ricardo Caballero – where one of the most important topics was fiscal policy. Several papers were also published on this issue: Perotti (2011) questions the validity and the applicability of expansionary fiscal consolidations, casting doubts on fiscal austerity solutions – somehow criticizing his own past views; Woodford (2011) assesses theoretical government expenditure multipliers; Farhi *et al.* (2011) design a new Keynesian model in which fiscal policy can be used to substitute exchange rate devaluation when the latter cannot be done (Euro Area case); and Romer and Romer (2010) estimate fiscal multipliers in an innovative way, taking into account the motivations for the tax changes in the United States in order to evaluate more precisely whether those changes were enacted for countercyclical purposes. However, there are still several difficulties in assessing the effectiveness of fiscal policy, hampering the recommendation of what measures should be adopted.

DSGE models may generate a variety of results, according to its specifications:

*In contrast, DSGE models can be adapted to address the current economic environment and current policies but, in so doing, the models generate an enormously wide range of multipliers, from the essentially zero estimate provided by Cogan et al. (2009) to estimates in the range of 3 to 4 provided by Christiano et al. (2009). More generally, relatively small changes in parameter specification – within ranges that cannot be ruled out by the empirical evidence – are capable of producing substantial shifts in estimated multipliers in the DSGE approach (Hall, 2009). (Auerbach and Gale, 2009)*

This means that, even if there is some consensus about the methodology and about monetary policy within new Keynesian economists, they seem to be far from a consensus on fiscal effectiveness, both in theoretical and empirical fronts. Notwithstanding, an important point is that, in spite of an *a priori* inadequacy of DSGE to deal with fiscal policy (as stated by Blanchard, 2008), many mainstream macroeconomists are using it to approach the effectiveness and desirability of fiscal policy<sup>16</sup>. The fact that a large part of the studies is being conducted with adaptations of the standard new Keynesian benchmark model reflects the mainstream economists belief that the DSGE framework is the most authentic methodology for macroeconomic research. The work of John B. Taylor and Spilimbergo *et al.* is dealing with the issue outside DSGE models, mostly due to the context (recrudescence of international crisis and the lower bound of interest rates) and, more importantly, because there was not a consensus or even enough written about fiscal issues.

Therefore, new Keynesians' theoretical amendments on the pre-crisis theoretical framework have an important – though nuanced – implication for the monetary, fiscal and regulatory policies recommendations. In most publications, explicitly or implicitly, new Keynesians manifest that the flawed approaches can be fixed with few changes in the way most economists understand and model the macro issues. However, within mainstream macroeconomics we can find some criticism that goes beyond improving current models.

An important example is Stiglitz (2011), who questioned, in a more incisive way, the reigning macroeconomic theory paradigm. He states that the nature of modeling is to create a simplified framework for understanding economic reality, abstracting from some aspects of reality through a set of hypotheses, to explain what one wants to explain. So, simply criticizing models because they do not include some aspects of reality is not a valid argument. Despite that, one must discuss whether something essential for explaining the selected aspect of reality was left out. Stiglitz (2011) argues that, because the current new Keynesian models are concerned with providing short-term fluctuations, *ex post* interpretation and designing policies to minimize business cycles impacts, these models are not a good starting point for explaining what costs more for the society, namely, the great recessions. This does not mean the DSGE models cannot be used, but the use of a single model to try to explain a wide range of aspects of reality is not adequate.

A good example of the limitation of these models is the representative agents used to derive the aggregate demand function. In such a framework, there is no space for market failures that require government assistance, nor may the distributive aspects influence the aggregate

demand. Even the governments are usually treated as exogenous. According to Stiglitz (2011), the great questions about today's macroeconomics are the credit frictions and their macroeconomic effects (the origin of the bubbles), how financial markets operate and amplify (not smoothen) economic shocks through their procyclical behavior and why, if they persist for a long time, do they disturb the economic activity.

Similarly, Caballero (2010) has a more critical view of the evolution of macroeconomics since the 70s, especially for the use of a sole model in the field's core. For him, DSGE's approach

*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. This is dangerous for both methodological and policy reasons."*

(Caballero, 2010, p. 85)

Although there is mainstream literature discussing bubbles, crashes, liquidity evaporation, fire sales, panic, etc., "*much of this literature belongs to the periphery of macroeconomics rather than to its core.*" (Caballero, 2010, p. 86). Moreover, this periphery had not only different subjects, but also a methodology oriented to isolate insights, not intended to address the overall effects on the macroeconomy.

The movement of rethinking macro, in Caballero's interpretation, can be characterized as bringing the periphery ideas into the core, in other words, an attempt to tell the periphery's story with DSGE models. But this cannot be done without tension between them, one of the most prominent sources of which is the contradiction between complexity (contained in the periphery's

models) and the rational expectations hypothesis. Somewhat skeptical about this process, Caballero (2010) says that

*this integrationist strategy does not come with an assurance that it will take us to the right place, as there is an enormous amount of path dependence in the process by which elements are incorporated into the core; and the baggage we are already carrying has the potential to distort the selection of the mechanisms of the periphery that are incorporated. Given the enormous complexity of the task at hand, we can spend an unacceptably long time wandering in surrealistic worlds before gaining any traction into reality.* (Caballero, 2010, p. 92)

The challenge now is beyond the integrationist movement, it is about bringing macroeconomics back to reality again:

*The challenges are big, but macroeconomists can no longer continue playing internal games. The alternative of leaving all the important stuff to the 'policy'-types and informal commentators cannot be the right approach.*

(Caballero, 2010, p. 100-1).

#### 4\_ An overview of mainstream macroeconomic views on change

The conformation of a new set of macroeconomic policies is still far from being consolidated. Demonstrations of concern about changes in models show that some members of this school of thought have no commitment

to the past errors in their models, at least the recognized ones. But what Blanchard *et al.* (2010) tried to do was to guide macroeconomic research in a reformist way, not a revolutionary one.

*This crisis was not triggered primarily by macroeconomic policy. But it has exposed flaws in the pre-crisis policy framework, forced policymakers to explore new policies during the crisis, and forced us to think about the architecture of post-crisis macroeconomic policy.* (Blanchard et al., 2010, p. 16)

The new Keynesian thought is, in general, more flexible than that of other schools, which are more mainstream, as they are more concerned with reality, as stated by Sicsú (1999). Thus, they were quick to recognize that their models did not explain or provide an adequate treatment for the crisis. The IMF's chief economist, Olivier Blanchard, quickly headed a movement indicating that the theory that supports policies should follow, in a way that creates certain barriers to ideas that suggest greater discretion or more revolutionary changes within the theoretical framework.

As stated by Duarte (2011),

*macroeconomists perceive their field as not only composed of competing schools of thought, but also characterized by a somewhat recurrent state of disarray.*

Blanchard, Woodford, Jordi Galí, David Romer, Frederic Mishkin, Mark Gertler, among others, were enthusiasts of the idea of a consensus in macroeconomics. A hypothesis for such enthusiasm is the view that the existence of a wide range of competing schools of thought, with none of them being dominant, is a sign of weakness of the science. Consequently,

*As an antidote to such a perception, the scientific and academic prestige of macroeconomists among both economists in general and other scientists could be boosted if they had a story to tell of steady progress and secure knowledge [...]*

*On the other hand, policymakers keep asking macroeconomists what theory they should use to guide policy, and intellectual disarray here is not good either. Macroeconomists can give a convincing answer as long as they are able to show that there is a core of usable macroeconomics in which they all believe* (Duarte, 2011, p. 5).

Aside from bringing the sensation that macroeconomics is not a battlefield,

*a narrative of consensus is a way of boosting credibility, both in academia and in the policymaking arena: if you tell the story of a synthesis that merges the strengths of the competing schools that preceded it, how can one oppose the view that the synthesis means progress?* (Duarte, 2011, p. 33)

The action led by Olivier Blanchard, with participation of other economists such as Michael Woodford, may be an attempt not to let the consensus slip away.

The gist of dominant thought in macroeconomic policy recommendations was, and still is, to avoid discretion of any policy, trying to increase its predictability. This is clearly the concern of those who put the idea that expectations are formed rationally

at the heart of their theory– which is not only a hypothesis of how the agents behave, but also a means of escaping from the Lucas critique –,that there is potentially an inflationary bias of policy makers and that macroeconomic policy should be guided (and is capable of being so) to anchor the agent's expectations. The movement of macro rethinking shows signs of triggering only a reform of the theories that backed up the optimal policies recommendations prior to the crisis. The main conclusions within theoretical mainstream economics still hold, despite the fact that there are some ideas that originally were not included in the NCM models, notably the non-neutrality of the financial system and the regulatory and macro-prudential policy dimensions.

Another important feature of NCM is the utilization of a specific class of models, the DSGE, micro-founded with intertemporally maximizing agents, using the natural rates (of interest and of unemployment) and rational expectations hypotheses. Broadly speaking, the most prestigious journals still publish primarily models adopting those new Keynesian assumptions, which dominate the scene since the new classical revolution. This shows that the convention and the belief in the methodology has not been considerably shaken, leaving room for the traditional macro-models to continue prevailing. Chari (2010, p. 2) goes further, affirming that

*any interesting model must be a dynamic stochastic general equilibrium model. From this perspective, there is no other game in town.[...]*

*Therefore, he continued, “a useful aphorism in macroeconomics is: ‘If you have an interesting and coherent story to tell, you can tell it in a DSGE model. If you cannot, your story is incoherent’.*

Chari's thought poses some issues about the alternatives to new Keynesian modeling. Within the current economic thinking, there is no major threat to the new Keynesians' position as the current dominant school of thought. Those that are usually associated with market clearing, such as new classical, run into great trouble in explaining the crisis and do not show enough strength to bring back to the theory the idea that financial markets work efficiently, and that prices are fully flexible. Moving toward those schools with an alternative theoretical approach, it is even harder to believe that any school of thought can take the new Keynesians' place.

First, models with rational expectations and maximizing-representative agents dominate the research within the U.S. and in most of Europe. Those assumptions are still major criteria for legitimizing the research and getting published in the most prestigious journals. Second, for the models with rational expectations and representative agents, the way to accept some kind of macroeconomic policies' intervention was developed and explored by the new Keynesians, through the inclusion of market frictions, which prevent market clearing in the short run. For another school of thought to become mainstream, approaches which push rational expectations and representative agents out of the models should be more widely used, explored, financed and published. Otherwise it is rather difficult since it would depend on broadening the scope of market frictions – as, in some sense, the new Keynesians are doing. The alternative would be the discovery of a different and more incisive way to demonstrate market imperfections in models with rational expectations, which, in turn, would be in some degree related to new Keynesian thinking, and has not yet emerged.

Much research in this direction has already been published by new Keynesians, most of them following the broad outlines of what Blanchard *et al.* (2010) recommend. But, even within new Keynesianism, there are still diverging lines in relation to what directions should be taken by macroeconomic policy, especially concerning fiscal and macro-prudential ones.

Some of the new Keynesians who were directly involved in the rise and spread of the ideas of consensus and inflation targeting are working on the reform, assuming that the models did not explain how to deal with the crisis. Cúrdia and Woodford (2010) ultimately deserve policy makers' attention for publishing a paper reformulating the underlying models of inflation targeting and including financial intermediation and bank spread as the determinant factors in macroeconomic equilibrium. For these authors, the crisis showed that the pursuit of stable inflation is insufficient to guide monetary policy; but, this does not mean that inflation targeting was completely wrong, as it helps to anchor expectations and to reduce disinflation costs. However, in this case, it opens up the possibility of criticism of the use of short-term interest rates as the only monetary policy tool which, in turn, makes it possible for new instruments to enter mainstream theory, namely, macro-prudential and regulatory policies as a macroeconomic instrument.

Regarding regulation, the possibility of policies aimed at interbank spread reduction in the case of a crisis has been incorporated into the models, which means the recognition of the possibility that the financial system negatively affects macroeconomic equilibrium determination. But the focus of macro-prudential regulation is, for some authors, being reduced to the intervention in interbank markets; hence, not including

reforms to manage systemic risks and to remodel financial markets' architecture.

On fiscal policy, some changes have been made within the new Keynesian framework and, as Blanchard (2008: 11) admits, "*a good normative theory of fiscal policy in the presence of nominal rigidities remains largely to be established*". On the one hand, the huge increase in sovereign debt, particularly in developed countries, contributed to the restoration of the pre-crisis convention that fiscal policy "*did more harm than good*" (Taylor, 2010b, p. 175). On the other hand, one may argue that the absence of a theoretical apparatus in NCM may have contributed to the debt increase. The expenditures were made in a non-systematic way, with a high degree of uncertainty about their effectiveness, which could have been partially avoided if there was a better understanding of the actions to be taken. This is not to say that all the essential elements for the phenomenon of comprehension will be apprehended by theoretical developments and that theory can move ahead of the facts, but that better knowledge and theoretical foundations could increase fiscal efficiency, taking economic activity and employment stabilization as targets. Given the recent discussions enumerated in section 3, fiscal policy still lacks further discussion and remains very far from a consensus. A major barrier is the sensitiveness of DSGE to model specifications for assessing the effects of fiscal policy, for evaluating social costs, benefits and the optimality conditions of fiscal policy.

Taking the mainstream economics, those who make the case for more meaningful changes, including in the methodology, are fewer than those working to integrate new dimensions into DSGE. Obviously, these are important claims, coming from Nobel Prize winner Stiglitz and from MIT graduate professor Caballero,

and in some sense from the IMF's chief economist Olivier Blanchard, but maybe their voices get lost in the selectively-deaf academy; or maybe their work will be successful enough to cover the core flaws and silence these voices. While making this "reform" of the theory and policy formality, some known structural issues and some inadequate premises remain outside the model, just to make it more tractable in a DSGE framework.

## 5\_ Conclusion

While there is still uncertainty about the direction, it is clear that a change is occurring in mainstream macroeconomics. Nonetheless, this new wave of change inside mainstream theory is not greatly distant from the new Keynesians' old format. The inherited RBC methodology continues to pervade most papers published on macroeconomic theory and policy in the most prestigious journals, and the conclusions have not been substantially changed, with the exception of the non-neutrality of the financial system. Leaving the methodology untouched is unlikely to create revolutionary or more meaningful changes to the main conclusions. Otherwise, the recognition of the non-neutrality of the financial system favors a discussion on the short-term interest rate as the sole macroeconomic policy tool, opening space for new kinds of regulatory and macro-prudential instruments, to address a wider set of macroeconomic goals.

Opinions that mainstream theory should escape the DSGE straitjacket can be found, but they represent a minority in the publications consulted. The main warning that one should extract from these publications, regardless of personal position on the use of the DSGE models, is that an over-reliance on a sole model

can create several problems for the development of macroeconomics, primarily that the research might become increasingly skewed with its internal logic and may lose touch the limitations induced by its construction.

New Keynesians have been changing some of their macroeconomic policy recommendations, incorporating new kinds of imperfections into their models, beyond price stickiness. We believe that this internal reform will allow them to continue as the mainstream and the main provider of ideas to policy makers, in this sense having more power to influence future macroeconomic policy due to the absence of a strong enough group of economists or, until this moment, any theory capable (and convenient enough) to dismiss rational expectations and representative hypotheses within the dominant thought. Moreover, the correlation among political forces does not demonstrate a movement towards a different framework to conduct macroeconomic policy, and the main institutions continue searching for answers mostly within new Keynesian and NCM frameworks.

If, on the one hand, as we showed, the crisis presented some impact on economic thinking then, on the other hand, economic thinking is also capable of influencing the performance and mindset of agents and the architecture of the economic system. Our conclusion is that economic theory has not experienced a revolutionary change in its mainstream until now, which implies that it is much harder to believe that modifications to macroeconomic policies and financial system standards will be propelled by economic theory.

## Notes

<sup>1</sup> Despite being described as a consensus, there is actually some divergence between them. See Duarte (2011).

<sup>2</sup> According to Dequech (2007), mainstream economics is “that which is taught in the most prestigious universities and colleges, gets published in the most prestigious journals, receives funds from the most important research foundations, and wins the most prestigious awards”. On the other hand, orthodox generally refers “to what historians of economic thought have classified as the most recent dominant “school of thought” (Colander *et al.*, 2004, p. 490).

<sup>3</sup> In the stronger version of rational expectations hypothesis, which derives from Muth (1961), the subjective expectations of economic agents will coincide with the right and objective model of those variables, even if they don’t know exactly the “correct” model that describe the economy. It is important to emphasize that this does not mean that the agents can correctly predict the future. Agents can make mistakes in forming their expectations, as this hypothesis allows forecasting with incomplete information. But, with rational expectations, on average, expectations will be correct, i.e., will be equal to the observed value. See Snowdon and Vane (2005, p. 226).

<sup>4</sup> According to Mankiw (2006), the New Keynesian work “*was not revolutionary, but it was not trying to be. Instead, it was counterrevolutionary: its aim was to defend the essence of the neoclassical-Keynesian synthesis from the new classical assault*”.

<sup>5</sup> The costs of inflation relate mainly to the non-predictable rising prices; the main costs are the loss of allocation efficiency, distortions on income distributions and on market price mechanisms, as well as increased uncertainty, which lower investment and economic growth.

<sup>6</sup> The idea that inflation targeting would be great both for inflation and output growth was baptized by Olivier Blanchard and Jordi Galí “divine coincidence” (Blanchard, 2008: 215). Blanchard *et al.* (2010) recognize, however, that it is not empirically proven, as the output gap is an estimated variable.

<sup>7</sup> Some examples are Bernanke *et al.* (1998), Kiyotaki and Moore (1997) and Holmstrom and Tirole (1997). A notable feature of these papers is that they were published in the aftermath of the Asian Crisis.

<sup>8</sup> The pre-crisis discussion in the dominant thought did not find the zero lower bound to be a real problem. In their theoretical framework, if the nominal interest rate passes its lower value, the central bank should increase the level of inflation, implementing a monetary expansion (quantitative

easing) – or even announce a credible one. The announcement of a monetary expansion would raise future expected inflation and, as the current inflation depends on expected future inflation, will cause the current inflation to rise. In this case, with the same nominal interest rates, the real interest rates are lower than before; i.e., the central bank credibility could, indeed, “manipulate” agent expectations according to monetary policy needs. That would be desirable if real, but the crisis showed that, in a world with large shocks, deflationary pressure is much greater than central banks’ capacity to anchor the expectations of inflation.

<sup>9</sup> But it must be noted that the Taylor (2010b) critique is restricted to immediate effects on the observed interbank market spread, ignoring that a lot of banks did in fact have liquidity problems. The U.S. government’s program to buy junk bonds improved the quality of banks’ balance sheets, which opened room for the perception of a lower counterparty risk. Therefore, this contributed to both the spread reduction and, especially, to the return of liquidity in the interbank market.

<sup>10</sup> The interest rate remains the only monetary policy instrument, despite the need for macro-prudential regulation. But if the central banks observe an increase

in interbank spread, they should, through a clear and transparent rule, prevent financial institutions from bankrupting by opening an exceptional credit channel (Taylor, 2009a, p. 25-7).

<sup>11</sup> See Cúrdia and Woodford (2010, p. 249-52).

<sup>12</sup> The required provisions for losses are lower in expansion periods and higher in recessive ones (due to a greater percent of bad debts). Thus, in periods with typically higher losses, the banks are obligated to worsen their results by increasing their reserves.

<sup>13</sup> The main recommendations are the use of fiscal policy to cover those who became credit and liquidity constrained and to address public spending quickly, starting with projects that were on stand-by. In general, the fiscal plans should demonstrate to financial markets the way out of fiscal stimulus and toward debt consolidation, to prevent the market from questioning the state’s solvency in the medium-term. It is important for the measures to be clearly reversible; that implemented policies eliminate distortions, amplify the scope of automatic stabilizers and show how the deficit caused by present measures should be reverted in the future; and, to strengthen fiscal governance, increasing spending transparency.

<sup>14</sup> Mainly Greece, Ireland and Portugal, and to a lesser extent, Spain and Italy.

<sup>15</sup> Not even in the case of liquidity trap does Taylor (2009b) believe that discretionary fiscal policy should be used. The author quotes, for example, the Japan case, that only came partially out of its 90's depression after a strong monetary expansion - and not by the use of fiscal policy instruments.

<sup>16</sup> See for instance Furceri and Mourougane (2010), Zubairy (2010), Ratto et al. (2009), Woodford (2011) and Farhi *et al.* (2011).

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E-mail de contato dos autores:  
italopedrosa@gmail.com  
maryse.farhi@gmail.com

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