THE NEW-KEYNESIAN APPROACH TO MONETARY POLICY ANALYSIS: LESSONS AND NEW DIRECTIONS*

Jordi Galí (CREI and Universitat Pompeu Fabra)

The New-Keynesian Framework: Key Elements

The New-Keynesian (NK) approach to monetary policy analysis has emerged in recent years as one of the most influential and prolific areas of research in macroeconomics.[1] It has provided us with a framework that combines the theoretical rigor of Real Business Cycle (RBC) theory with Keynesian ingredients like monopolistic competition and nominal rigidities. That framework has also become the basis for the new generation of models being developed at central banks, and increasingly used for simulation and forecasting purposes.[2] In the present chapter, I will try to summarize what I view as some of the key lessons that have emerged from that research program and to point to some of the challenges it faces, as well as possible ways of overcoming these challenges.

Among the key defining features of the NK approach to monetary policy analysis the following seem worth emphasizing:

- It adopts many of the tools originally associated with RBC theory, including the systematic use of *dynamic stochastic general equilibrium (DSGE) models* based on optimizing behavior by households and firms, rational expectations, market clearing, etc.

- Firms are modelled as *monopolistic competitors,* i.e., each firm faces a well-defined demand schedule for the good it produces, and sets the price of that good (as opposed to taking it as given) in order to maximize its discounted profits.

- Nominal rigidities are a key element of the model and a main source of monetary policy non-neutrality. They are generally introduced in the form of constraints on the frequency

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[1] See Galí and Gertler (2007) for a quick introduction to the NK framework. The textbooks by Woodford (2003b) and Galí (2008) provide a more comprehensive treatment and analysis of the NK model.

[2] See, e.g., Smets and Wouters (2003, 2007).

with which firms and/or workers can adjust their nominal prices and wages, respectively. An implication of such constraints is that price and wage-setting decisions become forward-looking, since agents recognize that the prices/wages they set will remain effective beyond the current period.

- Emphasis is given to the endogenous component of monetary policy (i.e., monetary policy rules) and the consequences of alternative specifications of that component, rather than to the effects of exogenous changes in a monetary policy instrument.

- The NK framework can be used in order to evaluate the desirability of alternative policy rules, as well as to determine the optimality of such a rule, using a welfare-based criterion, based on the maximization of the utility of the economy's representative consumer, and in a way largely immune to the Lucas critique.

In addition to the previous elements, which are inherent to the basic NK model, one should emphasize that an important characteristic of the NK framework more generally lies in its proven flexibility to accommodate a large number of extensions to the basic model, including those incorporating open economy features, imperfect information and learning, unemployment, credit frictions, etc.

But what are the main insights that have emerged from the NK research program and what are some of the challenges it faces? This is the subject to which the present chapter is devoted. The lessons and novel insights I will focus on below pertain to the following topics:

- The costs of inflation and the benefits of price stability.
- The role of expectations and the gains from commitment.
- Importance of *"natural"* levels of output and interest rates as policy benchmarks.
- The benefits of a *credible* anti-inflationary policy.

Before turning to a discussion of the above themes, I find it convenient to write down the three equations that constitute the simplest possible version of the NK model, and which I will use in subsequent sections to illustrate the main points I want to convey.

The first equation, usually referred to as the New-Keynesian Phillips Curve (NKPC), can be derived from the aggregation of the price-setting decisions by firms, combined with an equation describing the relationship between marginal cost and the level of activity. It takes the form:

$$\pi_t = \beta \, E_t \{\pi_{t+1}\} + \kappa \, x_t + u_t, \tag{1}$$

where π_t is inflation, x_t is the output gap, and u_t is a cost-push shock. The output gap, $x_t \equiv y_t - y_t^n$, is defined as the difference between (log) output y_t and the (log) natural level of output, y_t^n, where the latter corresponds to the level of output that would prevail in equilibrium in the absence of nominal frictions.

The second key block of the model relates the output gap positively to its expected one-period ahead value, and negatively to the interest rate gap, where the latter is defined as the difference between the real interest rate $i_t - E_t\{\pi_{t+1}\}$ and the natural rate of interest r_t^n, with the latter defined as the equilibrium real interest rate in the absence of nominal rigidities. The resulting equation is given by:

$$x_t = -\frac{1}{\sigma}(i_t - E_t\{\pi_{t+1}\} - r_t^n) + E_t\{x_{t+1}\}. \tag{2}$$

Finally, the model can be closed by means of a block describing how monetary policy is conducted. The simplest possible such description is given by a version of the so-called "Taylor rule", which takes the form:

$$i_t = \rho + \phi_\pi \pi_t + \phi_y \hat{y}_t + v_t,$$

where i_t is the short-term nominal rate, and $\hat{y}_t$ represents deviations of (log) output from steady state (or trend level).

The Costs of Inflation and the Benefits of Price Stability

What are the reasons why central banks should pursue a policy aimed at price stability? The NK framework provides a rigorous justification for such policies. To understand the main argument, let us assume at this point that there are no cost-push shocks, i.e. $u_t = 0$ for all t and that the presence of nominal rigidities is the only source of potential inefficiency in the level of output. In this case, and as captured by the NKPC (1), inflation will become an indicator of an inefficient level of activity, emerging from a deviation of output from its natural level caused by the presence of nominal rigidities. Thus, even if the central bank were not to care about inflation in itself, it will find its stabilization desirable as an indirect way to close the output gap. Furthermore, this will be possible even if the natural level of output (and thus the output gap) is unobservable.

But in addition to its role as a signal of an inefficient level of activity, the NK framework points to a more direct cost of inflation: It generates an inefficient allocation of resources across firms/sectors. To understand this channel, note that if there is positive inflation some firms must be raising their prices each period. But since not all firms can adjust their prices (or find it privately too costly to do so), relative prices will vary in ways not justified by sectoral or firm-level shocks, leading to suboptimal quantities of different goods being produced and consumed.

Note that a literal interpretation of the previous argument would call for zero inflation to be sought at all times, independently of the costs in terms of employment or economic activity. But in practice several factors may call for maintaining a positive average level of inflation. These include the risk of hitting a zero lower bound on the nominal interest rate if the average level of the latter (which is related to average inflation) were to be too low. Also, the presence of downward nominal wage rigidities which may prevent warranted reductions in real wages in the absence of positive inflation. Furthermore, and independently of the desired level for average inflation, the presence of cost-push shocks generates a short-run trade-off between stabilization of inflation and stabilization of the output gap. To the extent that variations in both variables are independent sources of welfare losses (and under standard assumptions regarding the latter), it will be optimal for the central bank to accommodate some of the inflationary pressures.

Both considerations, taken together, suggest as a desirable policy the attainment of a positive target for inflation, over a medium-term horizon. That prescription appears to be consistent with the strategy followed by many central banks around the world.

The Role of Expectations and the Gains from Commitment

The forward-looking nature of price setting and consumption decisions implies that both inflation and the output gap depend not only on the current value of their driving variables, but also on their anticipated future values. In other words, both inflation and the output gap are forward-looking variables. As a result, anticipated policy actions will have an influence on current outcomes, and thus the central bank may benefit from being able to influence related expectations. To illustrate this point, it is convenient to rewrite equations (1) and (2) as follows:

$$\pi_t = \kappa\, x_t + \kappa \sum_{k=1}^{\infty} \beta^k\ E_t\,\{x_{t+k}\} + u_t, \qquad (3)$$

$$x_t = -\frac{1}{\sigma}\, i_t - \frac{1}{\sigma} \sum_{k=1}^{\infty} E_t\,\{i_{t+k}\} + \frac{1}{\sigma} \sum_{k=1}^{\infty} E_t\,\{\pi_{t+k}\} + \frac{1}{\sigma}\, r_t^n. \qquad (4)$$

Suppose that an inflationary cost-push shock (i.e., a positive realization of u_t) hits the economy. In the absence of a commitment technology, the central bank can lower the current output gap in order to mitigate the impact of the shock on inflation. On the other hand, if the central bank can credibly commit to future state contingent actions, it can achieve the same inflation outcome with a smaller output gap decline by promising lower future output gaps, and thus driving down the expectational term in equation (3). To the extent that welfare losses are convex in the output gap, such a smoothing of the necessary output adjustment would be a more desirable strategy. Note, however, that such a policy will be time inconsistent: Once the shock has vanished, the central bank will be tempted to renege on its promises and stimulate the economy, bringing the output gap back to zero.[3]

A similar argument applies to the central bank's attempts to attain a given level of the output gap through changes in the interest rate: As (4) makes clear, it can do so by adjusting the current rate by a large amount or, alternatively, by smoothing the change over several periods, as long as it succeeds in convincing consumers (and firms, in a model with investment) that it will effectively do so. To the extent that fluctuations in interest rates generate welfare losses that are convex in the size of these fluctuations the second strategy would generally be more desirable.[4]

More generally, the analysis of monetary policy in the context of a model with forward-looking variables points to the importance of credible commitment as a way to improve the central bank's current trade-offs. Communication with the public about the central bank's intentions takes a central role in this context. The current practice of central banks like the Reserve Bank of New Zealand, the Norges Bank, and the Riksbank of publishing the future interest rate path that is anticipated by the banks' decision makers themselves, given their current information, can be seen as an excellent illustration of expectations management at work.

The Importance of Natural Levels as Policy Benchmarks

The natural levels of output and the interest rate play an important role in the design of monetary policy in the NK framework. Unfortunately, the inherent unobservability of these variables complicates their use in practice. Furthermore, their replacement by variables that may be viewed as proxies may do more harm than good.

A clear illustration of this problem can be found in the use of measures for the output gap. In numerous applications this variable is approximated by detrending (log) GDP using some statistical procedure, which generally associates the trend with a smooth function of time. By contrast, the benchmark used in the NK framework in order to determine the output gap is the natural level of output, which may display significant short-run fluctuations in response to all kinds of real shocks and, hence,

[3] See, e.g., Clarida, Galí and Gertler (1999) for an analysis of the optimal policy under commitment in the presence of cost-push shocks.
[4] See, e.g., Woodford (2003a).

is likely to be poorly approximated by a smooth function of time.[5]

In order to illustrate some of the potential consequences of using detrended output as a proxy for the output gap in implementation of policy, consider the problem of a central bank that seeks to minimize the loss function:

$$\sum_{t=0}^{\infty} (\alpha \varkappa_t^2 + \pi_t^2),$$

subject to (1). Let me restrict the analysis, for the sake of simplicity, to the case of no commitment, thus implying that the central bank takes expectations as given, effectively solving a sequence of static problems.[6] I also assume that $\{u_t\}$ and $\{y_t^n\}$ follow independent exogenous white noise processes.[7]

The optimality condition for this problem is given by:

$$\varkappa_t = -\frac{\kappa}{\alpha}\pi_t, \qquad (5)$$

for all t. Substituting this optimality condition into (1) and solving for inflation we obtain:

$$\pi_t = \frac{\alpha}{\alpha + \kappa^2} u_t,$$

which combined with (5) yields:

$$\varkappa_t = -\frac{\kappa}{\alpha + \kappa^2} u_t.$$

The implied standard deviations of inflation and the output gap are thus given by:

$$\sigma(\pi_t) = \frac{\alpha}{\alpha + \kappa^2}\sigma(u_t),$$

$$\sigma(\varkappa_t) = \frac{\kappa}{\alpha + \kappa^2}\sigma(u_t).$$

Suppose next that, given the unobservability of the output gap, the central bank replaces it with detrended GDP when trying to implement optimality condition (5). Thus we have:

$$\hat{y}_t = -\frac{\kappa}{\alpha}\pi_t,$$

or, equivalently,

$$\varkappa_t = -\frac{\kappa}{\alpha}\pi_t - \hat{y}_t^n. \qquad (6)$$

Combining (6) with (1) we can solve for the implied equilibrium levels of inflation and the output gap under the "approximate" optimal rule, which yields:

$$\pi_t = \frac{\alpha}{\alpha + \kappa^2}(u_t - \kappa\,\hat{y}_t^n),$$

and

$$\varkappa_t = -\frac{1}{\alpha + \kappa^2}(\kappa\, u_t + \alpha\,\hat{y}_t^n).$$

Thus, the implied volatility for the output gap and inflation are now given by:

$$\sigma(\pi_t) = \frac{\alpha}{\alpha + \kappa^2}\sigma(u_t) + \frac{\alpha\kappa}{\alpha + \kappa^2}\sigma(\hat{y}_t^n),$$

$$\sigma(\varkappa_t) = \frac{\kappa}{\alpha + \kappa^2}\sigma(u_t) + \frac{\alpha}{\alpha + \kappa^2}\sigma(\hat{y}_t^n).$$

Thus, we see that the focus on detrended output instead of the output gap leads to higher volatility in both inflation and the output gap, and hence, to greater welfare losses. Note that the additional welfare losses are proportional to $\sigma(\hat{y}_t^n)$, which measures the variability of the natural level of output. The intuition for this result comes from the fact that, under (5), the central bank fully accommodates all the variations in the natural level of output, keeping inflation and the output gap unchanged. By contrast, the adoption of (6) as a rule has the consequence (albeit unintentional) of smoothing output variations excessively, even when the latter are backed by changes in the

[5] See Galí and Gertler (1998) for a discussion of the implications of using detrended GDP in empirical evaluations of the New-Keynesian Phillips Curve.
[6] See Clarida, Galí, and Gertler (1999) for a more detailed analysis of that problem.
[7] The generalization to AR(1) processes is straightforward and yields no additional insights.

natural level of output. Note, finally, that the excess volatility created by the implementation of the "approximate" rule is increasing in the weight attached to output gap variability in the loss function.

The previous example illustrates the potential usefulness of measures of the natural level of output in the implementation of monetary policy. A similar case can be made for the natural interest rate: One can show that, under the model assumptions made above, the optimal discretionary policy can be implemented by means of an interest rate rule of the form:

$$i_t = r_t^n + \varnothing_\pi \pi_t,$$

with $\varnothing_\pi \equiv \frac{\sigma\kappa}{\alpha}$.[8] Note that the previous rule requires that the central bank adjusts the nominal rate one-for-one in response to variations in the natural rate. That policy is hampered in practice by the unobservability of the latter.

The importance of natural levels of output and the interest rate makes the development of estimated DSGE models particularly useful, since such models can be used to make inferences (however imprecise) regarding these variables. Perhaps not surprisingly, the behavior of the output gap measures that have been backed out from some of the existing estimated DSGE models has little resemblance to the ones obtained using traditional detrending approaches or an earlier generation of models.[9]

The Benefits of a Credible Anti-Inflationary Policy

Next I illustrate the benefits of credibility when pursuing a strong anti-inflationary policy. Suppose that the economy is, once again, described by equations (1) and (2).[10] The central bank follows a simple interest rate rule of the form:

$$i_t = \rho + \varnothing_\pi \pi_t, \qquad (7)$$

where $\varnothing_\pi > 1$. The public, however, believes the rule is given by:

$$i_t = \rho + \varnothing_\pi (1 - \delta)\, \pi_t + v_t, \qquad (8)$$

where δ is a constant that can be interpreted as a "credibility gap," measuring the extent to which the public "discounts" the central bank's anti-inflation stance. The error term v_t is taken to be an exogenous policy shock, following a white noise process. Finally, it is assumed that

$$\varnothing_\pi (1 - \delta) > 1.$$

I solve for the equilibrium of the model by combining (1), (2), and (8), for an arbitrary white noise process $\{v_t\}$, and under the assumption that the cost-push shock $\{u_t\}$ follows an AR(1) process with autoregressive coefficient ρ_u. For simplicity, I assume a constant natural interest rate $r_t^n = \rho$. The resulting equilibrium, which can be easily solved for using the method of undetermined coefficients, is given by:

$$\pi_t = a\, u_t + b\, v_t,$$

$$x_t = c\, u_t + d\, v_t,$$

where $a \equiv \dfrac{\sigma(1-\rho_u)}{\sigma(1-\rho_u)(1-\beta\rho_u) + \kappa[\varnothing_\pi(1-\delta) - \rho_u]}$,

$$b \equiv -\frac{\kappa}{\sigma + \kappa\varnothing_\pi(1-\delta)},$$

$$c \equiv -\frac{\varnothing_\pi(1-\delta) - \rho_u}{\sigma(1-\rho_u)(1-\beta\rho_u) + \kappa[\varnothing_\pi(1-\delta) - \rho_u]},$$

and $d \equiv -\dfrac{1}{\sigma + \kappa\varnothing_\pi(1-\delta)}$.

8 The desired allocation will be the unique equilibrium if $\alpha < \sigma\kappa$, i.e. if the interest rate rule satisfies the so-called "Taylor principle".
9 See, e.g., Edge, Kiley and Laforte (2007).
10 The exercise presented here is based on Blanchard and Galí (2007b).

Given that the central bank truly follows (7) it must be the case that, ex-post, $v_t = \delta \varnothing_\pi \pi_t$ for all t. We can then impose this on the equilibrium conditions above to obtain final expressions for inflation and the output gap as functions of the cost-push shock:

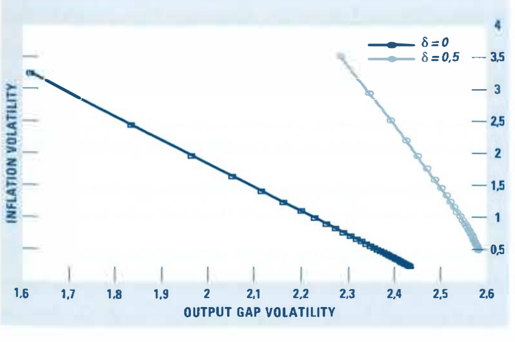
$$\pi_t = \frac{a}{1 - \delta \varnothing_\pi b} u_t,$$

$$x_t = \left(c + \frac{\delta \varnothing_\pi da}{1 - \delta \varnothing_\pi b} \right) u_t.$$

In oder to determine the impact of the credibility gap on the trade-off facing the central bank, I compute the standard deviations of inflation and the output gap, $\sigma(\pi_t)$ and $\sigma(x_t)$, implied by the previous expressions for a calibrated version of the model. In particular, I assume $\beta = 0.99$, $\kappa = 0.1$, $\sigma = 1$, $\sigma(u_t) = 0.25$ and $\rho_u = 0.9$; all of which are kept unchanged. I then consider two values for the credibility gap: $\delta = 0.5$ and $\delta = 0$, with the latter corresponding to the full credibility benchmark. *Figure 1* shows, for each value of δ considered, the locus of feasible combinations of $\sigma(\pi_t)$ and $\sigma(x_t)$ given the interest rate rule (7), with that locus being spanned by varying $\varnothing_\pi$ over its admissible range.[11]

Figure 1

Policy Credibility and Macroeconomic Volatility



As *Figure 1* makes clear, an improvement in credibility (captured here by a decline in δ from 0.5 to 0) makes it possible, through an appropriate choice of $\varnothing_\pi$, to reduce simultaneously the volatility of both inflation and the output gap. In other words, there are potential welfare gains to be made if the central bank conveys in a *credible* way the degree of its anti-inflationary stance. By appearing more dovish than the central bank actually is, the trade-off it faces between stabilization of inflation and stabilization of the output gap is likely to worsen.

Sources of Policy Trade-offs in the New-Keynesian Framework: A Challenge?

Despite the overall success of the NK research program and the favorable assessment of the ability of medium-scale versions of the NK model, several challenges remain. Here, I briefly discuss one such challenge which was the focus of Blanchard and Galí (2007a): The need to uncover relevant sources of policy trade-offs.

While the analysis above has made use of a version of the New-Keynesian Phillips Curve (given by (1)) that incorporates a trade-off between output gap and inflation stabilization in the form of an exogenous cost-push shock u_t, what the latter represents is often far from clear. In fact, the inflation equation that emerges in the baseline NK model lacks that feature and takes instead the form:

$$\pi_t = \beta E_t\{\pi_{t+1}\} + \kappa(y_t - y_t^n). \quad (9)$$

Note that, under (9), inflation occurs if and only if the level of output is above its corresponding level with flexible prices. The reason is that only in this case (and under standard assumptions) will average markups

[11] The standard deviation of inflation is multiplied by 4 so that it corresponds to a measure of inflation expressed in annual rates.

be lower than desired and, as a result, firms that adjust their prices will tend to increase the latter, generating inflation.

Furthermore, in standard versions of the NK framework, the underlying real model implies a constant gap between the natural (i.e., flexible price) output y_t^n and the efficient output, y_t^e. This gap is a consequence of the presence of monopolistic competition (with constant desired markups) in goods markets which, if uncorrected, makes output inefficiently low even in the absence of nominal rigidities. Formally,

$$y_t^e - y_t^n = \delta.$$

Combining both equations, we obtain:

$$\pi_t = \beta \, E_t \{\pi_{t+1}\} + \kappa \, (y_t - y_t^e + \delta), \qquad (10)$$

which makes clear the absence of a trade-off between stabilization of inflation and stabilization of the welfare-relevant output gap, where the latter is defined as the (log) deviation between output and the efficient level of output.

The lack of such a trade-off, a property which Blanchard and Galí (2007a) refer to as "the divine coincidence," implies that central banks should focus on completely stabilizing inflation, period by period, and with no concern for the output or employment losses that such a policy might bring about. The reason is that, according to the above framework, the resulting fluctuations in these variables would reflect, one-for-one, movements in their efficient levels. That implication is clearly at odds with conventional wisdom as well as with the practice of most central banks, including those that claim to follow an inflation targeting strategy. In practice, attainability of the inflation objective is understood to refer to the medium run, but not necessarily "continuously," as the model without a trade-off would imply.

A number of solutions to the above problem have been proposed in the literature. The simplest one, adopted in earlier sections of the present chapter, consists in appending an exogenous disturbance to inflation equation (10). That disturbance can be interpreted as resulting from exogenous variations in distortionary taxes, and/or exogenous changes in desired wage and price markups.[12] Such factors would lead to exogenous variations in the gap between the efficient and natural levels of output and, hence, to an inflation equation of the form:

$$\pi_t = \beta \, E_t \{\pi_{t+1}\} + \kappa \, (y_t - y_t^e) + \kappa \, \delta_t,$$

with the consequent policy trade-offs. Yet, that solution seems unsatisfactory, since it restricts the existence of meaningful policy trade-offs to shocks that are unlikely to be major drivers of macro fluctuations.

The introduction of staggered nominal wage setting, as in Erceg, Henderson, and Levin (2000), while leaving unaltered the property of a constant gap between y_t^e and y_t^n, generates a trade-off between price inflation and the welfare relevant output gap, as a consequence of the *endogenous* variations in wage markups resulting from the sluggish adjustment of nominal wages. Yet, this trade-off is somewhat apparent since it is possible to derive an equation for a particular weighted average of price and wage inflation, $\overline{\pi}_t$, which takes the same form as (10), with $\overline{\pi}_t$ replacing π_t. Most importantly, and as discussed in Erceg et al. (2000) and Woodford (2003b), complete stabilization of the welfare relevant output gap (and, hence, of the specific weighted average of price and wage inflation) is nearly optimal in this model. Thus, once again, the central bank should focus exclusively on

[12] See, e.g., Steinsson (2003).

fully stabilizing an inflation measure, period by period, without concern for the output and employment consequences of such a policy. In that sense, the model lacks a meaningful policy trade-off.

An Alternative Approach: Real Imperfections as a Source of Policy Trade-offs

In a recent paper with Olivier Blanchard, we have proposed an alternative source of monetary policy trade-offs, resulting from the existence of *real imperfections*. The latter may lead to inefficient responses to shocks, *even in the absence of nominal rigidities.*[13] In other words, and using the terminology introduced above, the natural level of output and the efficient level of output may not adjust by the same amount in response to different real shocks. As a result, the gap $y_t^e - y_t^n$ will vary endogenously, with the implied inflation equation being:

$$\pi_t = \beta E_t\{\pi_{t+1}\} + \kappa(y_t - y_t^e) + u_t,$$

with

$$u_t \equiv \kappa(y_t^e - y_t^n).$$

In this context, it is clear that an endogenous trade-off between inflation and output gap stabilization will emerge, with *strict* inflation targeting being no longer optimal.

What are examples of real imperfections that are likely to generate such trade-offs? In a series of recent papers with Olivier Blanchard we have focused on slow adjustment of real wages as such an imperfection.[14] In particular, if the real wage responds less than one-for-one to changes in the marginal rate of substitution when a supply shock (e.g., an increase in the price of oil) hits the economy, the natural level of output will display excessive fluctuations relative to the efficient level of output. Fully stabilizing inflation would require closing the gap between output and its natural level, which would thus generate welfare-reducing fluctuations in the gap between output and its efficient counterpart. A strict inflation targeting policy will generally not be optimal in this context. Instead, the optimal policy will generally involve a partial accommodation of inflationary pressures in the short-run, with inflation returning to its long-term target level only gradually.

One can imagine other real imperfections that would have analogous implications. Consider, for instance, a model with credit market imperfections along the lines of Bernanke, Gertler and Gilchrist (1999), in which there is an external finance premium (i.e., the wedge between the interest rate charged to firms to finance their investment projects and the consumer's marginal rate of intertemporal substitution) which is decreasing in net worth. The resulting model generates a financial accelerator mechanism: In the absence of nominal rigidities, adverse shocks will lead to a reduction in net worth and, consequently, an increase in the external finance premium and an inefficiently large reduction in investment and output. In the presence of nominal rigidities, there is room for monetary policy to affect the level of economic activity and thus to alleviate such excessive fluctuations. Doing so, however, would require deviating from a strict inflation targeting policy, since the latter will generally bring about the flexible price equilibrium allocation. Early explorations of the consequences of credit market frictions for the design of monetary policy can be found in Christiano, Motto, and Rostagno (2006), Faia and Monacelli (2006), Gilchrist and Leahy (2002), and Monacelli (2006).

[13] See Blanchard and Galí (2007).
[14] See Blanchard and Galí (2006, 2007a, 2007b).

Concluding Remarks

In the present chapter I have discussed some of the lessons for monetary policy that have emerged from the New-Keynesian research program. These lessons include, but are not restricted to, the benefits of price stability, the gains from commitment about future policies, the importance of natural variables as benchmarks for policy, and the benefits of a credible anti-inflationary stance. I have also pointed to one challenge facing NK modelling efforts – the need to come up with relevant sources of meaningful policy trade-offs – and briefly discussed a potentially fruitful approach to meeting that challenge, based on the introduction of real imperfections which create an endogenous time-varying wedge between the efficient and natural levels of output.

In spite of some of the challenges and shortcomings of the NK approach, I believe the overall verdict is a positive one. It has generated many novel insights that appear to be relevant for the design and practical conduct of monetary policy. It also provides a coherent framework to organize our thinking about the workings of the economy and to provide internally consistent accounts of actual macroeconomic developments. Furthermore, the NK framework has proved to be a very flexible tool, capable of accommodating a large number of features missing from the basic model, including open economy factors, imperfect information and learning, unemployment, credit frictions, etc. Finally, the ongoing adoption of the NK framework as the core of the medium-scale models under development at central banks and other institutions guarantees that at least some of the quantitative analysis undertaken at these institutions, whether aimed at policy simulation or forecasts, is backed by rigorous theoretical macro modelling. Time will tell whether central banks end up finding that quantitative analysis useful, but I think there are reasons to be optimistic as long as the expectations are not set too high. After all, even in its rich incarnation full of bells and whistles, the NK model is still a highly stylized representation of the economy, so one must be aware of its limitations. But it is certainly an improvement over purely statistical models or the old-fashioned, largely atheoretical macroeconometric models of the not so distant past.

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