CHAPTER 6

Forward Guidance and Prudence in Conducting Monetary Policy

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Over the past 25 years, there have been fundamental changes in the conduct of monetary policy. Many of them are related to the adoption of inflation-targeting frameworks and the increase in central bank communication with the public. Important discussions have taken place during these years, ranging from the desirability of low and stable inflation to the inclusion of financial stability as an explicit objective of central banks.

In recent years the global financial crisis gave rise to new challenges and debates. Although Latin America was not strongly affected by the crisis, it is no stranger to these debates. Some of them are relevant for the conduct of monetary policy under any circumstances, and others can teach us much about the use, costs, and benefits of resorting to unconventional policies in future crises.

The staff of the Central Bank of Colombia (Banco de la República) has closely followed many of these debates and has provided insights on some of them from its perspective. This chapter summarizes the analysis of two topics related to the conduct of monetary policy: forward guidance and dealing with uncertainty.

The term “forward guidance” as used here mainly refers to a policy strategy through which the central bank makes a promise about future levels of the monetary policy rate. The interest in forward guidance arose from the fact that several central banks in advanced economies (e.g., the Bank of Canada, the Bank of England, and the U.S. Federal Reserve) during the global financial crisis resorted to different unconventional policies—one of which was to commit to keep the interest rate low in the future so as to stimulate the economy through the effect on market expectations. The first part of this chapter uses a very simple framework to analyze some basic features of forward guidance in order to understand how useful this strategy can be during a crisis and whether it is worth pursuing during normal times. This will help us understand how useful the strategy could be for Latin America, since it is not going through a crisis.

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Since forward guidance has been widely analyzed in recent years, additional results and more technical details can be found in the previous literature. For instance, Eggertsson and Woodford (2003) show that, in theory, credibly committing to a low future policy rate is the optimal policy in a zero-lower-bound situation. However, empirically, there are mixed results on the effectiveness of forward guidance, as discussed in the next section. This chapter focuses on unconditional promises that are the common feature of time-based forward guidance, although recent literature (Boneva, Harrison, and Waldron 2015; Florez-Jimenez and Parra Polanía 2016) has argued in favor of the superiority of state-contingent forward guidance (i.e., announcing the economic conditions under which the central bank will deviate from the promised rate). This chapter also works under the assumption of perfect credibility; however, imperfectly credible promises have been considered (Bodenstein, Hebdon, and Nunes 2012). For a survey of theory versus practice of forward guidance, we refer the reader to Moessner, Jansen, and de Haan (2015).

Regarding the second topic of uncertainty and monetary policy, the Colombian central bank’s interest came from observing an increase in the volatility of some components of the country’s GDP, which gave rise to the idea that it could be related to an increase in the volatility of the measurement error. We studied the effects of uncertainty on optimal decision making from two different perspectives, the “standard” one, where the policymaker minimizes the expected loss; and the “prudent” one, where the policymaker minimizes the maximum possible loss across all potential scenarios as a way to avoid huge losses in the worst-case scenarios.

As in the case of forward guidance, additional results and more technical details can be found in the previous literature on policymaking under uncertainty from a robust control perspective. The robustness/prudence criterion has been recently considered for the design of optimal policies under uncertainty, and it is widely discussed in Hansen and Sargent (2008) and Barlevy (2009). Two recent examples of the analysis of monetary policy from the robust control perspective are Tillmann (2014) and Gerke and Hammermann (forthcoming). The former studies uncertainty about potential output and finds that robustness strengthens the case for appointing a conservative central banker. The latter analyzes monetary policy with imperfect interest rate pass-through and uncertainty about the model specification. They find that the aggressiveness or cautiousness of the robust optimal policy response depends on the source of the shock.

The next sections of this chapter provide details about the analysis of forward guidance and then prudence. These sections draw on the analysis of Florez-Jimenez and Parra Polanía (2016) on forward guidance and Parra Polanía and Vargas (2014) on prudence. Further analysis and technical details can be found in those studies.

FORWARD GUIDANCE

Following Campbell and others (2012), this section starts by distinguishing two types of forward guidance: Delphic and Odyssean. The former refers to the
central bank making public its own forecast on the likely path of future policy rates. This can be an effective communication tool, because it provides added information to market participants. The latter refers to the policy strategy of announcing and committing to, rather than just forecasting, a specific path of future rates. This distinction is relevant because while the main purpose of Delphic forward guidance is to communicate the central bank’s economic outlook, and, in that sense, is primarily an act of transparency, Odyssean forward guidance mostly intends to stimulate the economy by communicating a temporary change in the approach to the conduct of monetary policy.

To see the difference, consider the following examples. First, think of a central bank releasing a policy rate forecast (Delphic forward guidance) below the one expected by the market. The market might become more pessimistic (or less optimistic) about the future, since the forecast is communicating that the central bank thinks additional stimulus will be required. If, instead, the central bank promises a policy rate below the one initially expected (Odyssean forward guidance), as long as communication is clear, the market might become more optimistic (or less pessimistic) about the future, as the central bank is committing to keep the policy rate low even after the time when the economy requires a higher rate. In this case, the market understands that such action is not required to stimulate the economy in the future but to stimulate the economy today via expectations.

Odyssean forward guidance may face several problems, including, inter alia, lack of credibility and lack of clarity. With regard to the former, the announcement of a low future policy rate has to be credible so as to stimulate the economy through the effect on the market’s expectations. However, in order to live up to the promise, the monetary policymaker has to sacrifice flexibility, particularly, the possibility to respond to inflationary pressures in the future. Then the question arises why the central bank would assume the cost of fulfilling a promise whose benefits are already realized. Reputation could be a possible answer.

With regard to clarity, Odyssean forward guidance may be ineffective or even harmful to the economy if it is not clearly understood by the markets. For instance, the markets might interpret the announcement of a low future policy rate as a downward revision of the economic outlook (a projection rather than a promise).

Empirical assessments of the effectiveness of forward guidance as an alternative policy have produced mixed results. This may be due to the imperfect credibility of forward guidance and the ambiguity of the announcements (i.e., it is not crystal clear whether the announcements are projections or promises). For instance, while Campbell and others (2012) find that the markets impute Delphic content to policy announcements—that is, forward guidance is perceived as the release of central bank projections—Raskin (2013) and Femia, Friedman, and Sack (2013) find evidence that forward guidance leads to a change in the perception of the Federal Open Market Committee’s reaction function, and is therefore perceived as containing information about changes in the conduct of policy.
Under the assumption that Odyssean forward guidance is crystal clear and fully credible, let us now illustrate, in a two-period model, the following three results:

1. Forward guidance can improve welfare when the economy faces zero lower bound events;
2. However, even under such conditions (i.e., the promise is crystal clear and fully credible), unconditional commitment to future policy rates is better than discretion only in the most severe zero lower bound situations;
3. Therefore, Odyssean forward guidance does not improve welfare if the economy is not under a zero lower bound event.

The analysis corresponds to the case of unconditional promises, which is the common feature of “time-based” guidance (i.e., the central bank sets a date after which the current policy stance will change). Florez-Jimenez and Parra Polanía (2016) provide details in the case of “state-contingent” guidance (i.e., the central bank announces the economic conditions under which the policy stance will change and, in this sense, the promise has an escape clause).

The model consists of three equations; namely the loss function:

\[ L_t = \pi_t^2 + \lambda y_t^2, \]  

the Phillips curve:

\[ \pi_t = \beta E_t \pi_{t+1} + \kappa y_t, \]  

and the investment/saving (IS) curve:

\[ y_t = E_t y_{t+1} - \sigma (i_t - E_t \pi_{t+1}) + d_t, \]  

where \( \pi_t \) is inflation, \( y_t \) is the output gap, \( E_t \) is the expectations operator conditional on information available at time \( t \), \( \beta \in (0,1) \) is the discount factor, \( \lambda, \sigma, \) and \( \kappa \) are positive constants, \( i_t \) is the nominal interest rate, and \( d_t \) is the demand shock, which we assume is independently distributed over time. All variables are expressed as deviations from the steady state.

The central bank minimizes the loss function with respect to the interest rate. Since there are no lagged variables in the equations and shocks are uncorrelated, \( E_t y_{t+1} = E_t \pi_{t+1} = 0 \), and the solution is simple: \( i_t^* = (1/\sigma) d_t \) for every \( t \). In this case the loss for every period \( t \) is \( L_t = 0 \).

Now, assume there is a lower bound for the nominal interest rate such that a required condition for the interest rate is \( i_t \geq i_{\text{min}} \) (\( i_{\text{min}} < 0 \)). As a result, if the demand shock in period \( t \) is negative and less than a specific value (\( \sigma i_{\text{min}} \)), the

1In the case of state-contingent forward guidance, the (conditional) promise is welfare improving and better than discretion for any zero lower bound event. It remains the conclusion that forward guidance is not welfare improving if the economy is not under a zero lower bound event.

2This does not mean the interest rate can be negative. Since all variables in the model are expressed as deviations from the steady state, this condition implies that the lower bound is below the steady-state value of the interest rate. For instance, if the steady state is 3 percent and the lower bound for the rate is 0 percent, then \( i_{\text{min}} = -3 \% \).
central bank is not able to set the interest rate at its optimal level (since \( i^* < i_{\min} \)), that is, the economy faces a zero lower bound situation. Also assume that in period \( t+1 \) the economy is expected to recover and the demand shock is expected to be positive (and hence no zero lower bound event is expected to occur in \( t+1 \)).

If, under the above circumstances, the central bank acts discretionarily, \( i_t = i_{\min} \) and \( i_{t+1} = (1/\sigma) \), the loss in period \( t \) is

\[
L^D_t = \sigma^2 (\kappa^2 + \lambda) (i^* - i_{\min})^2, \tag{6.4}
\]

and the expected loss for \( t+1 \) is zero. The higher the deviation of the optimal rate (with respect to the interest rate lower bound) the higher the loss in period \( t \).

The central bank can alleviate the loss in period \( t \) (through the expectations channel) by committing to a future policy rate lower than the expected optimal rate, and therefore at the cost of increasing the expected loss of period \( t+1 \). The central bank promises, in \( t \), an interest rate for period \( t+1 \) \( (i_{t+1} | t) \) in order to minimize the expected discounted loss, that is, \( L^F_G + \beta E_t L^F_{t+1} \). The solution to this problem yields

\[
i_{t+1} | t = \left( \frac{1}{\sigma} \right) E_t d_{t+1} - a(i_{\min} - i^*), \tag{6.5}
\]

where

\[
a \equiv \frac{(\sigma \kappa + 1)(\kappa^2 + \lambda) + \kappa^2 \beta}{(\kappa^2 + \lambda)(\sigma \kappa + 1)^2 + \beta} \in (0,1).
\]

The economy is stimulated in \( t \), via expectations, by promising a future policy rate below the value that would be expected under discretion. The higher the deviation of the interest rate lower bound from the optimal rate, the lower the promised interest rate.

Using equations (6.1)–(6.3) and (6.5) we obtain:

\[
L^F_G + \beta E_t L^F_{t+1} = \beta(\kappa^2 + \lambda) \text{VAR}_{t} [d_{t+1}] + \frac{\beta \sigma^2 [2(\sigma \kappa + 1)] + \kappa^2 \beta (i^* - i_{\min})^2}{(\sigma \kappa + 1)(1/\sigma) + \kappa^2 \beta (i^* - i_{\min})^2}, \tag{6.6}
\]

where \( \text{VAR}_{t} [d_{t+1}] \) is the conditional variance of \( d_{t+1} \). Comparing equation (6.4) to (6.6), it can be verified that

\[
L^F_G + \beta E_t L^F_{t+1} < L^D_t \text{ if, and only if, } d_{t+1} < \sigma \left( i_{\min} - \sqrt{\omega} \right), \tag{6.7}
\]

where

\[
\omega \equiv \frac{\beta(\kappa^2 + \lambda) \text{VAR}_{t} [d_{t+1}]}{\sigma \sigma^2 [(\sigma \kappa + 1)(\kappa^2 + \lambda) + \kappa^2 \beta]}.
\]

From equation (6.7) we can see that under certain conditions forward guidance can improve welfare (with respect to discretion) when the economy faces a zero lower bound situation. Those conditions imply that the demand shock has

\[\text{We use the superscript } D \text{ to refer to the discretionary case and to compare this case to that of forward guidance.}\]
to be negative and large enough to make forward guidance preferable to discretion.\footnote{For the benchmark in Florez-Jimenez and Parra Polanía (2016), unconditional or time-based forward guidance is better than discretion only in the most extreme 16 percent of zero lower bound situations. Feroli and others (2016) also highlight the fact that time-based forward guidance should be used only in very unusual circumstances.} In those cases where the economy faces a zero lower bound situation but the negative demand shock is not very large \((\sigma (i_{\text{min}} - \sqrt{\omega}) < d < \sigma i_{\text{min}})\), the central bank prefers to act discretionarily rather than making an unconditional promise.

At the moment when this topic was analyzed, Colombia did not face a zero lower bound situation. The policy rate was 3.25 percent, so it was possible to make further reductions. However, we also wanted to know if forward guidance could be a useful alternative strategy for normal times. From the above results, the answer is no. Forward guidance stimulates the economy today at the cost of deviating from the optimal action tomorrow. The cost can be high, which is why even under a moderate zero lower bound situation, it is not good to resort to forward guidance. In normal times, if the economy requires further stimulus, the best choice is to reduce the current policy rate. If the central bank is still able to reduce the current policy rate to respond to current shocks, it has no incentives to stimulate the economy by making a promise that will tie its hands in responding to future shocks. Furthermore, why would the market believe the central bank will set the future policy rate below its optimal value when, at the same time, it is not willing to further reduce it today?

Notice, however, that the aforementioned conclusion refers to Odyssean forward guidance. As noted earlier, the purpose of Delphic forward guidance is mostly related to transparency, and therefore its effects may be substantially different.\footnote{Empirical examples of Delphic forward guidance can be found in the Czech Republic, New Zealand, Norway, or Sweden.} By providing forward guidance, the central bank may reveal some private information to the markets, and this in turn may help reduce uncertainty, which could positively affect the economy. Since reducing uncertainty can be relevant both in crisis and normal times, Delphic forward guidance could be helpful at any moment. However, as explained above, if the purpose is to provide further stimulus to the economy, Delphic forward guidance may not always be the best tool, particularly if private information is revealing a negative economic outlook.

From the theoretical point of view here described, since sacrificing flexibility is costly, promises on the future interest rate path seem to be useful in crisis periods only (especially if accompanied by an escape clause), while Delphic forward guidance can be mainly used during normal times.\footnote{Using a New Keynesian model, Fujiwara and Waki (2016) argue, however, that Delphic forward guidance can be undesirable, because revealing the central bank’s private information about future shocks may increase the volatility of inflation expectations.} In practice, however, language is tricky, and communication problems may make it difficult to distinguish clearly between a promise and a forecast, although this may also be a consequence of the central bank incentives to communicate strategically.
Finally, it should be noted that the analysis here is based on a simple model. Further analysis is required to incorporate other elements, such as financial risks related to the increased predictability of a very low rate for long periods.

**PRUDENCE**

In 2013, when the Colombian statistics office revealed the figure for the country’s economic growth in the third quarter of 2012, it was surprising both for the market and for the central bank. Specifically, the figure for the growth of civil works was unexpectedly low. Although this component is characterized by high volatility, at that particular moment there was some evidence that it had become more volatile in recent quarters.

Higher volatility of an estimated variable can be attributed to an increase in the volatility of the actual variable or an increase in the volatility of its measurement error. One of the questions we tried to answer with regard to this matter was how monetary policy should react to higher volatility in the measurement error in an indicator of aggregate economic activity.

To answer that question, we analyzed the problem from two different perspectives, according to the objective of the monetary policymaker. From the first perspective, from which we derive the “standard” policy, the central bank minimizes its expected loss function. From the second perspective, from which we derive the “prudent” policy, the central bank minimizes the maximum possible loss across all potential scenarios.

The latter perspective has been well received in the economic literature. This is because, on the one hand, it represents an alternative way to explore the design of optimal policies under conditions of uncertainty, particularly when the decision makers do not know the probabilities of all relevant scenarios (and therefore cannot calculate the expected loss). On the other hand, this perspective is seen as a prudent approach because it avoids large losses in all possible events, regardless of how likely they are. An intuitive example is provided by Feldstein (2003), who writes that a “prudent” man is the one who carries an umbrella even when the weather forecast says the probability of rain is low, because the small inconvenience of doing so protects him from the larger trouble of being caught in a downpour.

Using a stylized model in which the output gap is measured with error (i.e., there is a noisy signal of the demand shock), we obtain the following results:

1. As is common, both the standard and the prudent central bank reduces (increases) the policy rate when it receives a signal of a negative (positive) demand shock. However, the prudent central bank reduces (increases) the interest rate more than the standard one.

2. If the volatility of the measurement error increases, the standard central bank attenuates its response to the signal. The reaction of the prudent central bank

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7As mentioned in the introduction, more details on this approach can be found in Hansen and Sargent (2008) and Barlevy (2009).
is the same if its risk aversion is low to moderate, or the opposite (i.e., its response is stronger) if its risk aversion is high enough.

We also analyze numerical results for the same model but with forward-looking expectations and find that result (2) is robust to this change. But result (1) changes: in this case the prudent central bank is less aggressive than the standard one in responding to the shock signal.

We set up a stylized model that incorporates two particular features: first, some degree of persistence for the output gap, and second, a monetary policy lag such that it affects output more rapidly than inflation.

The model consists of three equations, namely, the loss function:

\[ L_t = \pi_t^2 + \lambda y_t^2, \quad (6.8) \]

the Phillips curve:

\[ \pi_t = \eta E_{t-1} \pi_t + \kappa y_{t-1}, \quad (6.9) \]

and the IS curve,

\[ y_t = \rho y_{t-1} - \sigma (i_{t-1} - E_{t-1} \pi_t) + d_t, \quad (6.10) \]

where \( \pi_t \) is inflation, \( y_t \) is the output gap, \( E_t \) is the expectations operator conditional on information available at time \( t \), \( \eta \in (0,1) \), \( \lambda \), \( \sigma \), and \( \kappa \) are positive constants, \( i_t \) is the nominal interest rate, and \( d_t \) is the demand shock, which we assume is independently and normally distributed over time, \( d_t \sim \mathcal{N}(0, \text{VAR}_{d_t}) \), where \( \text{VAR}_{d_t} \) is the variance of \( d_t \).

There is a statistics office that releases a provisional estimate of the output gap every period for that same period (\( \hat{y}_{t} \)), and the final estimate of the same variable for the previous period (\( y_{t-1} \)). The former estimate contains a measurement error (i.e., \( \hat{y}_{t} \equiv y_{t} + \varepsilon_t, \varepsilon_t \sim \mathcal{N}(0, \text{VAR}_{\varepsilon_t}) \)) and the latter estimate contains no error.

Neither the central bank nor private agents have private information. The timing for any period \( s \) is as follows: (1) the statistics office releases \( \hat{y}_{t} \) and \( y_{t-1} \); (2) private agents form rational expectations; (3) the central bank picks \( i_t \); and (4) shocks (\( d_t, \varepsilon_t \)) realize but they are unobserved.

**Standard Perspective**

To solve the above setup from the standard perspective, we can model uncertainty as a signal extraction problem (Harvey and de Rossi 2006) in which economic agents construct a signal of the demand shock (in period \( t-1 \)) using the available information: \( \hat{d}_{t-1} \equiv \hat{y}_{t-1} - \rho y_{t-2} + \sigma (i_{t-2} - E_{t-2} \pi_{t-1}) \), and therefore, from equation (6.10) and the definition of \( \hat{y}_{t} \): \( \hat{d}_{t-1} = d_{t-1} + \varepsilon_{t-1}. \hat{d}_{t-1} \) is a noisy signal of the demand shock and the corresponding forecast is:

\[ E_{t-1}[d_{t-1} | \hat{d}_{t-1}] = \gamma \hat{d}_{t-1}, \]

where \( \gamma \equiv \text{VAR}_{\varepsilon_t} / (\text{VAR}_{d_t} + \text{VAR}_{\varepsilon_t}) \). The higher the relative amount of noise \( \text{VAR}_{\varepsilon_t} \) / \( \text{VAR}_{d_t} \), the lower the weight given to the signal.
It can be shown that, given that expectations are rational, minimizing the expected loss implies:

\[ i^*_{t-1} = \left( \frac{\kappa}{1 - \eta} + \frac{\rho}{\sigma} \right) E_{t-1} \gamma_{t-1}, \]

and \( E_{t-1} \gamma_{t-1} = \rho T_{t-2} - \sigma (i_{t-2} - E_{t-2} \pi_{t-1}) + \gamma \hat{d}_{t-1} \). Due to the uncertainty about the exact value of the output gap, the central bank needs to estimate its value, which in turn involves the past output gap (due to output persistence), the lagged real interest rate (due to the monetary policy lag), and the signal of the demand shock.

The above result, in turn, implies that

\[ \frac{\partial i^*_{t-1}}{\partial \gamma_{t-1}} > 0, \]

that is, a higher demand-shock signal increases the policy response. Since the weight \( \gamma \) depends on the measurement error volatility (\( \text{VAR}_{\epsilon_t} \)), we can also obtain

\[ \frac{\partial i^*_{t-1}}{\partial \text{VAR}_{\epsilon_t}} = \left( \frac{\kappa}{1 - \eta} + \frac{\rho}{\sigma} \right) \frac{\partial \gamma}{\partial \text{VAR}_{\epsilon_t}} < 0, \]

that is, an increase in the measurement error volatility implies a higher proportion of noise in the signal, and therefore the central bank’s optimal response to changes in the signal is mitigated.

**Prudence**

For this approach, following the previous literature (van der Ploeg 2009), we assume that the central bank plays a min-max game where the measurement error is externally set with the purpose of maximizing the loss taking account of the central bank’s action. In this case the objective function (also known as the “stress function”) of the central bank includes its degree of prudence:

\[ \Gamma_t = \pi_t^2 + \lambda \gamma_{t-1}^2 - \frac{\theta}{\text{VAR}_{\epsilon_{t-1}}} \epsilon_{t-1}^2, \]

where \( \theta > 0 \) is inversely related to the central bank’s risk aversion, and the last term in the objective function incorporates the fact that there is a finite level of prudence, and therefore measurement errors cannot inflict infinite losses on the central bank.

It can be shown that, given the measurement error process and the expectations of private agents, the optimal response of the central bank is:

\[ i^*_{t-1} = \left( \frac{\kappa}{1 - \eta} b_1 + \frac{\rho}{\sigma} b_2 \right) E_{t-1} \gamma_{t-1} + \frac{\rho}{\sigma} b_2 (1 - \gamma) \hat{d}_{t-1}, \]

\[ \text{From the standard perspective, it can be seen that the solution to the one-period problem is equal to that for the multiple-period problem. See Parra Polanía and Vargas (2014, footnote 5). This is no longer true for the case of forward-looking expectations.} \]

\[ \text{In this case the model is solved for an infinite-horizon scenario. See Parra Polanía and Vargas (2014).} \]
where

\[ b_1 = 1 + \frac{\eta \kappa}{\sigma (\theta / \text{VAR}_{\epsilon,t} - \kappa^2)} > 1 \]

and

\[ b_2 = \frac{\theta / \text{VAR}_{\epsilon,t}}{\theta / \text{VAR}_{\epsilon,t} - \kappa^2} > 1. \]

From the above equation,

\[ \frac{\partial \hat{d}_{t-1}^*}{\partial d_{t-1}^*} = \frac{\kappa}{1 - \eta} b_1 \gamma + \frac{\rho \kappa^2 \theta}{\sigma (\theta / \text{VAR}_{\epsilon,t} - \kappa^2)^2 (1 - \eta)} > 0. \]

As in the standard case, a higher demand-shock signal increases the policy response of the central bank. However, since \( b_1 > 1 \) and \( b_2 > 1 \), the response of the prudent central bank to changes in the signal is greater than that of the standard one. If risk aversion of the central bank were nil \((\theta / \text{VAR}_{\epsilon,t} \to \infty)\), there would be no difference between the standard and the prudent response. However, the presence of risk aversion makes the prudent central bank less willing to mitigate its response to the signal.

Also, as

\[ \frac{\partial \hat{d}_{t-1}^*}{\partial \text{VAR}_{\epsilon,t}} = \frac{\kappa}{1 - \eta} b_1 \frac{\partial \gamma}{\partial \text{VAR}_{\epsilon,t}} + \frac{\rho \kappa^2 \theta}{\sigma (\theta / \text{VAR}_{\epsilon,t} - \kappa^2)^2 (1 - \eta)^2}, \]

when the measurement error volatility increases, there are two opposite effects on the optimal policy response. On the one hand, there is a reduction on the signal’s weight in agents’ expectations and, through this channel, it is less relevant for the central bank. On the other hand, it increases the central bank’s relative prudence, as can be seen in the objective function. As a result, the total effect can be negative (as in the standard case) or positive, that is, the central bank responds more strongly to the signal when there is a perceived increase in the measurement error volatility. The latter occurs only when the central bank’s risk aversion is very high.

We also can change the Phillips curve \((\pi_t = \eta E_t \pi_{t+1} + \kappa y_{t-1})\) in order to incorporate forward-looking expectations. In this case we derive conclusions from numerical solutions for a specific set of parameters (Parra Polanía and Vargas 2014). We find that, as in the original model, when the measurement error volatility increases, the effect on the change of the policy rate can be positive or negative. However, while in the original model we find that it is always the case that the prudent central bank reacts more aggressively to a higher demand-shock signal, in the model with forward-looking expectations, the prudent central bank reacts less aggressively to it. The influence of forward-looking expectations on the transmission mechanism reduces the damage measurement errors can cause.

**CONCLUSIONS**

This chapter has summarized some insights from the perspective of the staff of the Central Bank of Colombia on two topics related to monetary policy: forward
guidance (in its Odyssean version, that is, committing to future policy rates) and policy prudence under uncertainty.

The chapter has argued that unconditional (or time-based) forward guidance improves welfare only in the most severe zero lower bound events (despite the fact that it is assumed to be fully credible and clear). As a corollary, forward guidance should not be used as a strategy in normal times.

With regard to dealing with uncertainty from a robust control or prudent perspective, the chapter has argued that a prudent central bank reacts (changing the policy rate) more aggressively to a demand shock signal than a standard central bank. However, the opposite happens when the market’s expectations are forward-looking: robustness or prudence does not always imply a stronger response in the face of uncertainty.

The chapter has also maintained that when the volatility of measurement errors (of the demand shock) increases, the standard central bank attenuates its response to the signal. The reaction of the prudent central bank is similar, if its risk aversion is relatively low, or the opposite (i.e., its response is stronger) if its risk aversion is high enough.

REFERENCES


