Price-Level Targeting and Inflation Expectations: Experimental Evidence*

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Abstract

We use an economics decision-making experiment to test a key assumption underpinning the efficacy of price-level targeting relative to inflation targeting for business cycle stabilization. In particular, we attempt to infer whether experimental participants understand the stationary nature of the price level under price-level targeting by observing their inflation forecasting behaviour in a laboratory setting. This is an important assumption since, without it, price-level targeting can lead to worse outcomes than inflation targeting. Our main result suggests that participants formulate inflation expectations consistent with the target-reverting nature of the price level but they do not fully utilize it in forecasting inflation.

JEL Classification: E32, E52

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1 Introduction

Since the early 1990s central banks have increasingly been using inflation targeting as a basis for their monetary policy framework. First adopted by the Reserve Bank of New Zealand in 1990, inflation targeting, as of 2010, has been implemented by more than 25 central banks worldwide, with several others in the process of moving toward it. The Bank of Japan and the European Central Bank remain important exceptions but they appear to have embraced many of the main elements of inflation targeting. This apparent convergence on a particular monetary policy framework begs the question: Is this as good as it gets? Is inflation targeting the best monetary policy for a central bank to follow?

In a similar way, the late 1970s and early 1980s witnessed a number of central banks converging on money demand targeting as a means to conduct monetary policy. This consensus, however, was broken in the mid-1980s when changes in banking led to unreliable money demand relationships, forcing many central banks to abandon money demand targeting as a money policy framework. The recent financial crisis may be having a similar effect, leading some to ask whether the current inflation targeting consensus needs to be re-visited.

An alternative approach to monetary policy implemented by the Riksbank in the 1930s and actively being studied by the Bank of Canada as a potential replacement for their current inflation targeting regime is price-level targeting. Eggertson and Woodford (2003), Svensson (2003) and Evans (2010), among others, have proposed price-level targeting as a potential means to moderate the effects of the zero lower bound. Theoretically, price-level targeting performs better than inflation targeting in terms of business cycle stabilization and mitigating episodes at or near the zero bound on nominal interest rates, but its efficacy hinges on an important assumption: economic agents must forecast inflation rationally (in a Muth sense) and in a manner consistent with the price-level targeting regime. If agents do not, then

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it is entirely possible for price-level targeting to deliver results that are inferior to inflation targeting. Given the potential utility of price-level targeting, it is important to see if private agents would admit inflation expectations consistent with price-level targeting. Unfortunately, evidence regarding how inflation expectations evolve under price-level targeting is sparse. As such, we attempt to fill this important void by undertaking an experimental economics laboratory study to shed some light on the question of inflation expectations formation under price-level targeting.\footnote{While the question we ask is novel, the application of experimental economics to understanding the formation of inflation expectations is not. See, for example, Marimon and Sunder (1993, 1994), Hommes (2007), Adam (2007), and Pfajfar and Zakelj (2009) for an application of experimental economic to inflation expectations. More generally, experimental economics has been used to explore many topics central to macroeconomic issues such as optimal lifetime consumption and savings decisions, coordination, theories of money, commitment versus discretion, fiscal and tax policies, and central bank decision making with some success (Duffy 2008). Indeed, experiments are a widely accepted methodology in economics, with the 2002 Nobel Prize in economics being awarded for contributions in this area.} We do not view our work as a definitive statement on the price-targeting debate but, rather, as a preliminary investigation into the potential usefulness of price-level targeting as a guide for monetary policy.

This paper is structured as follows. Section 2 offers a comparison between inflation and price-level targeting, focusing on the importance of inflation expectations for monetary policy. Section 3 describes the experimental design and procedures while Section 4 reports the results based on our experiments. Section 5 concludes.

\section{Inflation Targeting versus Price-Level Targeting}

Recall that the inflation rate is simply the percentage change in the price level. For low levels of inflation, this relationship is well-approximated by the linear equation, \( \pi_t = p_t - p_{t-1} \) where \( \pi_t \) is the inflation rate in period \( t \) and \( p_t \) is the logarithm of the price level. The equation can be rearranged to give \( p_t = p_{t-1} + \pi_t \). When the relationship between the price level and inflation is written in this form, it is apparent that any shock to inflation will have a permanent effect on the price level unless offset by a future shock. For example, a positive shock to inflation in period \( t \)
would increase the price level in period $t$ and all future periods unless it is offset by a negative shock of equal magnitude at some point in the future.

Under inflation targeting (IT), no attempt is made to correct past deviations from target. If inflation is above target today, the central bank will not deliberately engineer inflation below target in the future, and vice versa. Thus, under IT, shocks to inflation are allowed to have a permanent effect on the price level. In contrast, price-level targeting (PLT) aims to bring the price level back to a price-level target in the following periods.

To highlight this difference between IT and PLT, consider the case of a purely transitory inflationary shock in a canonical new Keynesian macroeconomic model (see Gali and Gertler 1999). After the shock, inflation rises and economic activity falls (a consequence of monetary policy tightening in response to the shock) but, importantly, the expected rate of inflation remains anchored at the target since the shock is transitory and does not affect future inflation. In other words, inflation expectations remain anchored on the target and therefore neither exacerbate, nor mitigate, the impact of the shock. As soon as the shock dissipates, inflation and activity return to their long-run averages. In contrast, the price level rises permanently.

Now consider the same transitory shock under PLT. In contrast to the scenario under IT, the expected rate of inflation falls, as agents anticipate the future lower inflation rates required to offset the increase in inflation and return the price level to its target. The decrease in inflation expectations increases the real interest rate which implies that monetary authority does not need to be as aggressive as under IT. In fact, this self-reinforcing mechanism moderates the movement in inflation and economic activity relative to the IT regime. The key point is that the movement of inflation expectations allows the central bank to achieve greater stabilization of inflation and economic activity under PLT than IT. If, on the other hand, expectations do not endogenously adjust, then PLT will lead to worse stabilization outcomes than IT. Therefore, how inflation expectations adjust under a price-level targeting regime is a key question.
3 Experimental Design

In our experiments, subjects are atomistic so their inflation expectations do not affect macroeconomic outcomes as our aim is to see if experimental participants are capable of producing inflation forecasts consistent with the target-reverting nature of the price-level under PLT. In the experiment, the subjects observe realized values of macroeconomic variables in the model economy (where all agents behave rationally) and attempt to predict inflation in the next period. The accuracy of their inflation forecasts determines the amount of their payout. Subjects are recruited from a standard "convenience" subject pool consisting of university undergraduates using the widely-used ORSEE internet recruiting tool (see Greiner 2004 for details), which provides access to students at four universities in Montreal, Quebec, Canada. The experimental participants report a wide variety of intended majors, and are roughly split equally between genders. The experiments are conducted at the Center for Interuniversity Research and Analysis on Organizations (CIRANO) experimental economics laboratory.

3.1 Monetary Policy and Payoffs

In an effort to isolate how subjects may change their inflation expectations formation behavior, we generate inflation and price-level time series that are consistent with simple inflation targeting and price-level targeting rules. Under IT, we assumed that the central bank stabilizes expected inflation at zero, that is $E_t \pi_{t+1} = 0$. Under PLT, on the other hand, the central bank sets policy such that the expected price level next period is at its constant target, that is $E_t p_{t+1} = \bar{p}$. In other words, in any period the best inflation forecast under IT is the inflation target whereas under PLT the best prediction of inflation is the inflation rate that takes the price level back to its constant target. In addition, we ensured that the variability of inflation is the same across IT and PLT regimes so that any gains in predicting inflation under price-level targeting would not be attributable to a change in the volatility of inflation.

There are three features of the current approach worth highlighting: (i) This experimental design matches the targeting horizon of the central bank and inflation
forecasting period at one period such that the rational expectations inflation forecast is conceptually simple and does not require elaborate forecasting techniques to forecast the dynamic path of inflation multiple periods into the future; (ii) as the optimal forecasts are simple, any deviations from rational forecasts are straightforward to observe and analyze; and (iii) since optimal forecasts of inflation have drastically different dynamics under IT and PLT (optimal inflation forecast is fixed under IT and it is perfectly negatively correlated with the current price level under PLT), the experiment allows us to clearly determine if participants exploit the additional information that the price level provides under PLT.

We discretized the forecasting strategy space to simplify and focus the subjects’ decision making on the essence of the forecasting problem. That is, a participant is asked to choose an interval where he or she predicts next period’s inflation rate will lie. If the correct interval is chosen, the payoff is maximized. There are 13 intervals comprised of 11 interior intervals and two unbounded intervals at the endpoints. The interior intervals span 0.5 percent with the middle interval centered on zero percent inflation and bounded by 0.25 and -0.25 percent. The other interior intervals are constructed similarly. The two endpoint intervals capture inflation forecasts that are either greater than 2.75 percent or less than -2.75 percent.

A quadratic loss function based on forecasting accuracy determines payoffs. Incorrect intervals result in increasingly smaller payoffs depending on the distance from the correct one. Owing to the flatness of a quadratic function at its maximum, the quadratic payoff function used in this experiment rewards inflation forecasts that are "close" almost as well as inflation forecasts that lie in the correct interval. The latter feature suggests that it may be more difficult for subjects to detect differences in optimal inflation expectations formation across IT and PLT regimes.

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3 In our experiment, rational expectations forecasts of inflation are optimal forecasts. Thus we use these two terms interchangeably.
4 The endpoint intervals are constructed to match approximately two standard deviation realizations of inflation.
5 The figure in the experimental instructions in Appendix A displays the loss function.
3.2 Experimental Procedures and Parameters

As a first step, we simulate stochastically the macroeconomic model, and store the resulting time-series data for inflation, output, aggregate price level and the short-term interest rate under two scenarios. First, we simulate an economy where the central bank targets a zero inflation rate, and second, an economy where the central bank targets a constant price level. As mentioned above, when we simulate the price-level targeting regime, we ensure that the variance of inflation is the same as in the IT regime.

We implement our simulated macroeconomy over the computer network in the experimental laboratory at Center for Interuniversity Research and Analysis on Organizations in Montreal, Canada. The computer provides an interface, which presents subjects with the history of the previous eight periods of their economy. This history consists of the variables required to make an optimal prediction of inflation: inflation and aggregate price level. These two variables are displayed in tables and graphs on the subjects’ computer screen. The other variables are not displayed as they are not necessary inputs for making optimal forecasts. Indeed, by providing only inflation and the price level, we hope to focus the subjects’ attention to the movement or lack of movement in inflation for making optimal forecasts.

At the beginning of the game, subjects are shown eight consecutive periods of macroeconomic results, and asked to predict annualized inflation for the next period. In the case of inflation targeting, a horizontal line fixed at zero in the inflation graph reminded the subjects of the central bank’s target; in the case of price-level targeting, a line showing the price-level target was always present. After making their choice by selecting one of the 13 forecast intervals, the next period’s results are displayed, and the previous seven periods shifted to the left, always providing a window with the last eight periods’ results.

Subjects were instructed that their task is to predict the rate of inflation in a computer-simulated economy. To clarify the role of the central bank, we made the point that under IT, the central bank does not concern itself with the past price level. As well, subjects were reminded that under PLT, the central bank would act
to bring the price level to its constant target. The instructions for the two different regimes were parallel, involving identical paragraph and sentence structures.\textsuperscript{6}

Finally, subjects are given a broad overview of properties of the underlying model used to generate the time-series data, but not its details. They were also told that the underlying structure would not change, but that random shocks present in the model would make the underlying structure more difficult to discover. This type of instruction where details of a complicated macro model are not revealed has been used by Blinder and Morgan (2007) and Engle-Warnick and Turdaliev (2010), and reflects the fact that people in the real world make forecasts of inflation without a complete understanding of macroeconomy.

We conducted two experimental treatments. Each treatment consists of one 20-period forecasting game, followed by two consecutive games, each lasting 40 periods. The first 20-period game allows the subject to "practice" under an initial regime. For these first 20 periods, subjects repeatedly predict inflation for the next period without pay. This gives subjects the opportunity to learn the system without fear of being penalized for experimentation. The following 40-period game was identical to the first except that the subjects were paid for the accuracy of their forecasts, and experienced a different draw from the database of simulations. Thus, after acquiring experience in an experiment designed to maximize experimentation and learning, they repeated the task with an economic incentive to make an accurate inflation forecast. More specifically, in the control treatment, IT-IT, subjects made their forecasts in three consecutive inflation-targeting economies whereas in the manipulated treatment, IT-PLT, subjects practiced under inflation targeting, forecasted for pay under inflation targeting, and then forecasted for pay after a regime change to price-level targeting. Note that regardless of whether a regime change is implemented or not, the session is stopped after the first 40 periods, and a single page of instructions is distributed for the second 40 periods. The instructions reminded subjects of the role of the central bank, and either stated that central bank continued with IT or shifted to a PLT regime.

As mentioned earlier, subjects are paid depending on the distance between their

\textsuperscript{6}Appendix A contains the experimental instructions.
chosen interval and the correct realized interval. The payoff function is set using Monte Carlo simulations so that optimal forecasting would yield approximately $40 on average for 40 periods of forecasting. Twenty-eight subjects participated in the IT-IT treatments and 25 participated in the IT-PLT targeting treatment. The average payoff was approximately $30 in addition to a standard $10 show-up fee at the experimental laboratory.

4 Results

4.1 Graphical Analysis

In this section, we explore informally how well experimental participants forecast relative to their optimal counterparts. Figure 1 presents histograms of optimal forecasts for the IT and PLT sessions. We label the bins by their midpoints, thus, for example, the bin labeled “0” contains inflation forecasts between -0.25 and 0.25 percent. The left histogram presents the distribution of optimal inflation forecasts under IT. From the histogram it is apparent that the optimal inflation forecast under IT is the inflation target which is zero in the current experiment. The histogram on the right-hand side presents same information under PLT. Unlike the IT case, optimal forecasts under PLT require agents to predict time-varying inflation rates, reflecting the negative relationship between today’s price level and the optimal one-step ahead forecast of inflation.

Figure 2 presents histograms of subjects’ choices in the IT-IT session. In the figure, the histogram on the left-hand side presents choices from the first forty-period game for pay (first regime), and the right histogram presents choices in the second forty-period game (second regime). The figure shows that nearly all choices were limited to the bins between -1 and 1, and that more observations are in the zero bin in the second regime. The latter suggests an element of learning may have been occurring. An interesting question that arises from these results is why subjects predict non-zero inflation rates (about 50 percent of the time) even though
inflation is a random process around a mean of zero.\textsuperscript{7} This phenomenon of observing persistence in random data has been documented in the psychology literature and is referred to as the "hot hand" (see, for example, Tversky and Kahneman 1974). The experimental economics literature has also noted this behavior. Huber, Kirchler and Stockl (2008) develop a non-monetary policy laboratory experiment where subjects attempt to predict an unknown process (the process is, in fact a random series). After this experience, subjects are asked to advise a second group of experimental participants on predicting the same unknown process. Consistent with our results, Huber et al. observe advice that would accord with predicting a persistent series.\textsuperscript{8}

The IT-PLT sessions give the histograms presented in Figure 3. We can see that the results under IT in the first regime are quite similar to those reported in Figure 2. As under IT, subjects’ inflation forecasts under PLT are different from their optimal counterparts. Relative to the distribution of optimal inflation forecasts displayed in the right panel of Figure 1, participants choose the zero bin too often (40 percent versus 30 percent under the optimal prediction scenario) suggesting they are not fully exploiting the implications of a mean-reverting price level into their inflation forecasts.

The graphic analysis, thus far, suggest that participants are taking only partial advantage of the implications of IT or PLT in forming their inflation forecasts. Relative to their optimal counterparts, inflation forecasts are too dispersed under IT and too concentrated under PLT.

\subsection*{4.2 Simple Experiment}

In this section we attempt to infer more formally whether inflation expectations adjust in a manner consistent with price-level targeting or inflation targeting. To this end, we use the data generated in the experiments and summarize them using

\textsuperscript{7}The answer likely does not lie with real world experience since Canadian monthly consumer price index inflation has been close to an iid process since the mid 1990s.

\textsuperscript{8}This literature, unfortunately, does not provide any direction on how to mitigate this type of behaviour.
simple panel regressions of the form:

\[ E_t \pi^i_{t+1} = a + \beta p_t + \gamma \pi_t + \varepsilon^i_t \]

where \( E_t \pi^i_{t+1} \) is the \( i \)-th subject’s expectation of inflation in the next period, \( p_t \) is log-deviations of price level from its constant trend, \( \pi_t \) is the current period rate of inflation and \( \varepsilon^i_t \) is a residual term. The parameters \( \beta \) and \( \gamma \) measure the sensitivity of inflation expectations to movements in the price level and inflation, respectively. Under IT we would expect to see \( \hat{\beta} \) and \( \hat{\gamma} \) to be equal to zero if expectations are rationally generated since optimal inflation forecasts under our IT rule are always zero. Under PLT and rational expectations, we would expect \( \hat{\beta} = 1 \) and \( \hat{\gamma} = 0 \) as the best prediction of inflation is perfectly negatively correlated with today’s deviation of the price level from its target. Further, in an effort to account for potential subject heterogeneity in our regression results, we report White (1980) heteroscedasticity-robust standard errors.

The estimation results are reported in Table 1.\(^9\) The second and fourth columns provide a sense of the effect of \( p_t \) and \( \pi_t \) on expected inflation under IT. The estimates of \( \gamma \) are approximately equal to 0.14 and statistically significant in both regressions, implying that subjects tend to forecast inflation as if it were persistent even though it is not. The overall level of inflation prediction errors is relatively high, with incorrect intervals chosen in 55 per cent of the cases. Interestingly, we see similar perceived inflation inertia under PLT in the right-most column of Table 1. The elasticity of expected inflation with respect to current realized inflation is about 0.17 (after controlling for the price level).

The effect of price-level deviations and the inflation rate on expected inflation under PLT is found in columns three and five. Recall that a good forecast of inflation under the current PLT experiment should, at least, exhibit a negative correlation with

\(^9\)We also investigated two alternative specifications. First, in an effort to account for subject heterogeneity, we ran subject-by-subject OLS regressions and then computed the mean regression coefficients across subjects. Second, to incorporate past experimental evidence of forecast smoothing, we included a lagged dependent variable in the regressions. Both alternative specifications returned quantitatively similar results.
The results suggest that subjects tend to use this directionality property of PLT, on average, by admitting negative estimates of $\beta$ ranging between -0.38 and -0.55. The later regression coefficient suggests that (after controlling for perceived inflation inertia), on average, people expected that 55 per cent of price deviations from target would be corrected by next period. The inflation forecasts are suboptimal since both estimates of $\beta$ are statistically different from -1. In other words, subjects are not taking full advantage of a key property of PLT in forming their inflation forecasts. Overall, subjects seem to produce inflation forecasts consistent with the stationarity implication of PLT but the accuracy of those forecasts does not improve over IT as forecasting errors occur approximately 60 per cent of the time.

4.3 Richer Experiment

In this section, we report regression results based on a richer, potentially more realistic, experiment. We use a simple structural macroeconomic model based on Gali and Gertler (1999) to generate the data. Relative to the earlier setup, the current experimental design does not force next period’s inflation or price level back to its target in each period. Instead, the path of inflation is dictated by a historical monetary (Taylor) rule under IT and a PLT rule that maintains the same variance of inflation as under IT. This new feature requires subjects to face the more difficult task of accounting for the dynamic path of inflation when calculating their inflation expectation. Adding to the difficulty, this experiment also requires subjects to provide point inflation forecasts rather than choose intervals, and the targeted price-level path grows at 2 percent rather than being a fixed value.

Again, we summarize the data using panel regressions. The results are reported in Table 2 and can be compared to the parameter estimates obtained under the optimal prediction rule presented in Table 3. Overall, these results support the conclusions

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10 Detailed information on the macroeconomic model can be found in Appendix A of the working paper version of this paper which is available at http://www.bankofcanada.ca/publications-research/research/working-papers/

11 See the final paragraph in Appendix A for a fuller description of the monetary rules.

12 There are 50 subjects in the IT-IT treatment and 53 in the IT-PLT session.
regarding PLT from the previous section. That is, once we account for the persistence in inflation, subjects tend to use the directionality implication of PLT implied by the negative estimates of \( \beta \). More precisely, all the parameters estimates are relatively close to their optimal counterparts except for the coefficient corresponding to the price level term under PLT (right-most column in Table 2). In the latter case, the influence of the price level on expected inflation is less than 40 per cent of its optimal effect. This result is, however, consistent with the earlier conclusion that subjects use the directionality implication of PLT but not by the full amount.

5 Concluding Remarks

The objective of this paper has been to determine if agents would forecast inflation in a manner consistent with target-reverting nature of the price level under a regime of price-level targeting. The approach we use, experimental economics, to shed light on our question has been applied to examine other questions related to inflation expectation formation. Nonetheless, our conclusions are tentative because the results found in an experimental economic laboratory are only a rough guide to real-world behaviour. Yet with this caveat in mind, it is useful to write our conclusion as clearly as possible.

The results suggest that inflation forecasting behavior changes between IT and PLT regimes. In our simple experiment, subjects move from (incorrectly) relying only on inflation to predict future inflation under IT to using (not fully) the directionality implication of PLT under a PLT regime. An experiment based on a richer, potentially more realistic, economic model also shows subjects tend to rely on the target-reverting nature of the price level to generate their inflation forecasts under PLT. In a sense these results are surprising as experimental participants were able to modify their inflation expectations formation behaviour across IT and PLT regimes; despite having only little information about the economy and given no practice when the targeting regime shifted from IT to PLT. It should be emphasized that the shift to PLT in the experiments was explained only once to subjects. In the real world, a central bank would likely undertake an ongoing communication strategy to explain
and remind the public about the implications of PLT, thereby helping agents to more fully exploit the properties of a PLT regime. Moreover, real-world agents would also have access to inflation forecasts from professional forecasters. Attempting to incorporate these features into a macroeconomic experiment may be a useful avenue for future research.
References


Table 1: Panel Regression Results for Expected Inflation

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<th>Policy Regime</th>
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<td>IT</td>
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<tr>
<td>Price Level</td>
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Henceforth * indicates significance at the 1 percent levels. All regressions contain an unreported constant term. Standard errors are in parentheses and based on White (1980) consistent variance-covariance estimator.
Table 2: Panel Regression Results for Expected Inflation
Richer Experiment

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White (1980) robust standard errors in parentheses
Table 3: Panel Regression Results for Optimal Expected Inflation
Richer Experiment

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White (1980) robust standard errors in parentheses
Figure 1: Distribution of optimal forecasts of inflation for IT (left) and PLT (right)
Figure 2: Distribution of inflation forecast choices for IT-IT sessions.
Figure 3: Distribution of inflation forecast choices for IT-PLT sessions.
A  Not for Publication Appendix: Instructions for the Experiments

What you will be doing
You will predict inflation in a computer-simulated economy. Your pay will depend on how accurate your predictions are. Your pay will depend only on your decisions and the results generated by the simulated economy. It will not depend on the decisions of any other participants.
You make many decisions today. Each time you make a decision is called a period.

The economy
You can think of the computer economy as simulating the activity of a real economy. It can be thought of as consisting of households, who work and buy goods; intermediate firms, that provide the goods needed to make a final good; the firm that produces the final good that is purchased by the consumers; and a central bank that uses its short-term interest rate to achieve control over the economy.

The central bank
The central bank provides stability to the economy. The bank has one mandate: To stabilize inflation.
Inflation is the change of the average price of goods and services in the economy. It is the difference in the price level between the current period and the previous period. The central bank attempts to stabilize inflation at a target of 0 per period. That is, the central bank attempts to make the difference between the current price level and the previous price level 0.
If inflation moves higher or lower than 0, due to randomness in the economy, the central bank will act to return inflation back to the target. The bank uses its interest rate to achieve its objective of stabilizing inflation at 0.
This implies that the central bank is not concerned with achieving a price level target but instead attempts to maintain or return inflation to its target.
There will be a line on the screen showing you the inflation target.

How you make your decisions
You will be shown the price level and inflation in your economy. The price level and inflation are determined by the structure of the economy, and some randomness that makes the structure difficult to determine.
At the start the computer will show you eight periods of economic results. You will then predict inflation for the next period. After you do, the computer will show you
results for the next period, and you will predict inflation again for the subsequent period.
For your decision you choose an interval within which you expect the next period’s inflation to fall. For example, one interval is 1.75% - 2.25%. In total there are 13 intervals. All of the intervals are 0.5% wide. You make your decision by clicking on the interval you choose.
When you choose your bin, you will see an asterisk, that is, the character "**", located underneath the center of the bin containing the previous period’s inflation. This character is placed on the screen to assist you with your forecast of inflation for the next period.

The number of decisions you make
You will predict inflation for twenty periods for practice. You will not be paid for your practice. You may use the practice to learn how the simulation works.
You will then predict inflation for 80 periods for pay.
For each decision the relationships between economic variables are identical. The randomness, however, will be different, and independent of any past decisions you make.

How you will be paid
The better your prediction of inflation, the higher is your pay.
Each period the computer will determine how many bins there are between your prediction and the bin that actual inflation falls in. The closer your predicted bin is to actual inflation, the higher your pay.
This graph shows your pay, in dollars, for a period, depending on how many bins away your prediction is:
The horizontal axis, labeled 0,1,2,...,7, represents the distance between the bin you choose and the bin within which inflation actually falls. The vertical axis, labeled 2.00, 1.00, 0.00,...,-6.00 represents your pay for a decision in one period.
For example, if inflation falls within the bin you choose, then the distance between your prediction and actual inflation is 0, and you earn $0.83 for the period. For another example, if inflation falls 7 bins away from your prediction, then your pay for the period is approximately -$5.24. Since there are 13 bins, you could be as many as 12 bins off with your prediction, in which case you would earn approximately -$17.01 for the period.
The pay is scaled so that on average, if you make the best possible prediction every quarter, you can earn about $40.
During a period, it is possible to make negative earnings. Your earnings are computed by adding up your earnings for every period. You cannot make negative earnings in
a session.
You will be paid in cash for all of your decisions.
The bottom line is that the better your prediction, the higher your pay.

**A reminder of the role of the central bank**
The central bank provides stability to the economy. The bank has one mandate: To stabilize inflation.
Inflation is the change of the average price of goods and services in the economy. It is the difference in the price level between the current period and the previous period. The central bank attempts to stabilize inflation at a target of 0 per period. That is, the central bank attempts to make the difference between the current price level and the previous price level 0.
If inflation moves higher or lower than 0, due to randomness in the economy, the central bank will act to return inflation back to the target. The bank uses its interest rate to achieve its objective of stabilizing inflation at 0.
This implies that the central bank is not concerned with achieving a price level target but instead attempts to maintain or return inflation to its target.
There will be a line on the screen showing you the inflation target.

**The role of the central bank does not change.**
The role of the central bank does not change with this reminder.
The simulation will restart, showing the first 8 periods exactly as at the start of the session. The simulation is independent of simulation you just completed. Please raise your hand if you have any questions. To continue, the password is the word "continue".

A reminder of the role of the central bank
The central bank provides stability to the economy. The bank has one mandate: To stabilize inflation. Inflation is the change of the average price of goods and services in the economy. It is the difference in the price level between the current period and the previous period. The central bank attempts to stabilize inflation at a target of 0 per period. That is, the central bank attempts to make the difference between the current price level and the previous price level 0. If inflation moves higher or lower than 0, due to randomness in the economy, the central bank will act to return inflation back to the target. The bank uses its interest rate to achieve its objective of stabilizing inflation at 0. This implies that the central bank is not concerned with achieving a price level target but instead attempts to maintain or return inflation to its target. There will be a line on the screen showing you the inflation target.

The role of the central bank now changes
The central bank provides stability to the economy. The bank has one mandate: To stabilize the price level. The price level is an average price of goods and services in the economy. The central bank attempts to stabilize the price level at 5 every period. If the price level moves higher or lower than 5, due to randomness in the economy, the central bank will act to return the price level back to the target of 5. The bank uses its interest rate to achieve its objective of stabilizing the price level around the target of 5. This implies that the central bank is not concerned with achieving a constant inflation target but instead attempts to maintain or return the price level to its target. There will be a line on the screen showing you the current price level target. The simulation will restart, showing the first 8 periods exactly as at the start of the session. The simulation is independent of simulation you just completed. You continue to predict inflation each period. The password is "continue".