Targeting Inflation Expectations?

Mridula Duggal*
University of Glasgow

Abstract

This paper investigates how agents' inflation expectations respond to monetary policy changes, using a New Keynesian model with rational expectations, trend inflation, and adaptive learning. Theoretical results suggest that with rational expectations, inflation expectations adjust quickly, driving inflation dynamics, while adaptive learning introduces a more gradual adjustment process dependent on agents' learning speed. Leveraging a natural experiment with survey data from professional forecasters across 32 countries under Inflation Targeting regimes, I empirically examine these dynamics. Contrary to model predictions, I find that realized inflation leads expectations, with agents often over-predicting inflation following policy changes. This result challenges standard assumptions about the expectations-inflation relationship, suggesting we may overestimate the role of expectations in driving inflation. These findings imply that central banks may enhance credibility by reinforcing targets with actual inflation outcomes, which appear more influential in shaping expectations than previously thought.

Keywords: *Inflation Expectations, Monetary Policy, Subjective Expectations, Adaptive Learning, Inflation, Regime Shifts*

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1 Introduction

Expectations play a crucial role in macroeconomics, particularly in the context of monetary policy. Modern macroeconomic theory [1] highlights the importance of inflation expectations in influencing both current and future inflation dynamics. Central banks use frameworks such as Inflation Targeting (IT) to help anchor these expectations, aiming to create more stable and predictable inflation outcomes. However, a gap remains in the literature regarding how expectations evolve during transitions in monetary policy, particularly when agents' expectations deviate from rationality.

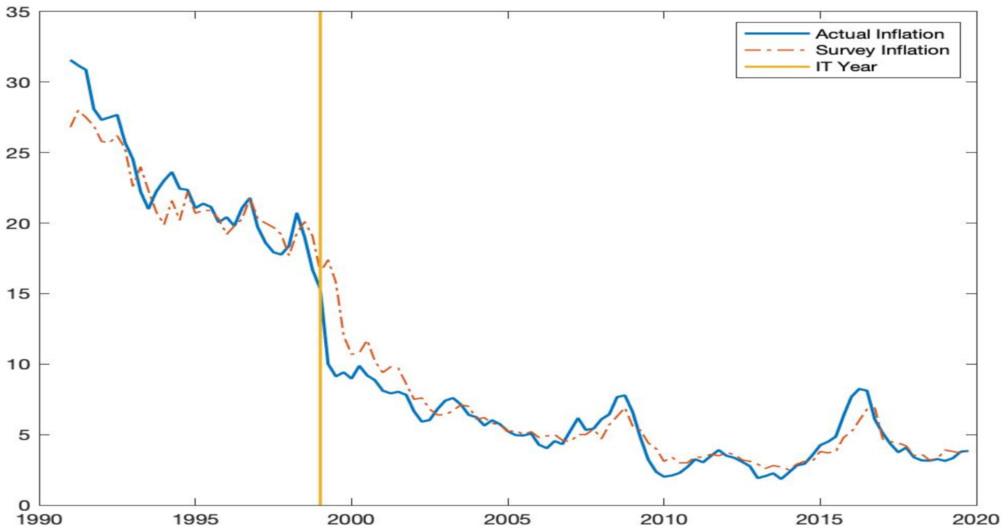
To address this gap, this paper leverages IT as a natural experiment to study how expectations adjust in response to policy changes. Currently, around 60 countries have adopted IT, providing a unique setting to observe shifts in inflation expectations as regimes change. Unlike much of the existing literature, which primarily examines expectations within equilibrium settings or under the assumption of a Taylor rule Coibion et al. (2020), this paper explores the process through which regime changes impact expectations over time.

Figures 1 and 2 present preliminary evidence from Colombia and the United States, respectively, illustrating a puzzle in the data. The blue solid line represents realized inflation, while the red dashed line depicts inflation expectations based on a survey of professional forecasters' six-month-ahead predictions. The yellow vertical line indicates the introduction of IT in both economies. In Colombia (Figure 1), inflation expectations begin to adjust at the time of the policy introduction, yet they tend to track actual inflation rather than lead it. In contrast, in the United States (Figure 2), there is no observable change in expectations following the policy announcement or implementation, with significant breaks in both inflation and expectations occurring during the financial crisis, as documented by Gerko (2017). This empirical evidence raises a question: Does a change in monetary policy lead to a change in inflation expectations?

This research paper explores whether a change in monetary policy influences inflation expectations and their formation process. Using a theoretical and empirical framework, it investigates if the communication of a new policy framework prompts agents to adjust the mean of their inflation expectations. As a consequence, the paper examines whether communication alone is sufficient for belief adjustment or if agents require evidence to adjust expectations.

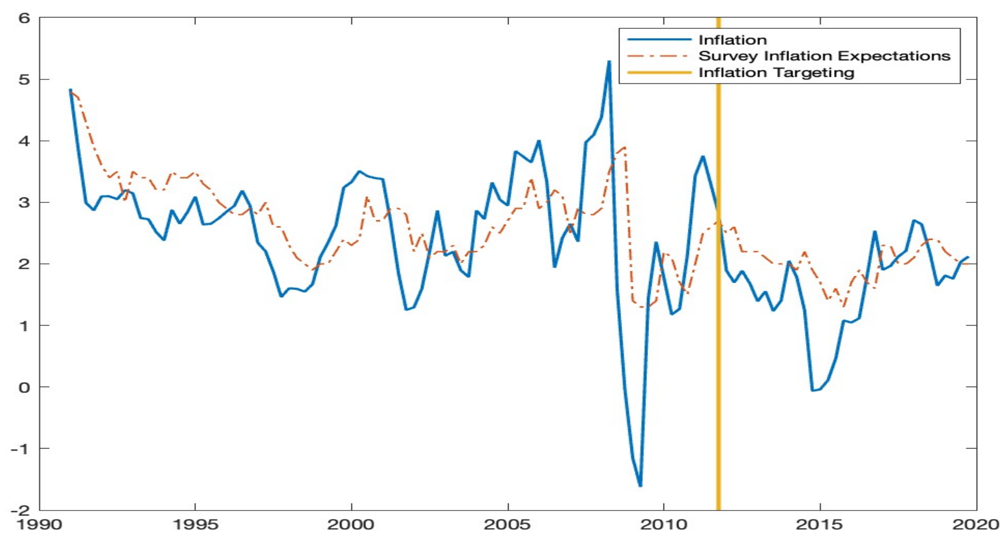
[1] As emphasized by Calvo (1983) and others

Figure 1: Colombia: Inflation and Inflation Expectations



Note: The blue line is two-quarter realised inflation, the red dotted line is survey inflation expectations six months ahead and the yellow vertical line is at $t = 1999$ when IT was introduced in Colombia

Figure 2: United States: Inflation and Inflation Expectations



Note: The blue line is two-quarter realised inflation, the red dotted line is survey inflation expectations six months ahead and the yellow vertical line is at $t = 2012$ when IT was introduced in the US

In addressing these questions, this study makes several contributions to the literature on belief formation. Firstly, it is one of the first to investigate the response of inflation expectations to monetary policy changes. I do so by, first, solving a standard three-equation New Keynesian model with trend inflation under the assumption of Full Information Rational Expectations (FIRE). This model delineates the expected path of inflation expectations following an announced regime change, represented by a shift in the central bank's monetary policy rule from no specific to a constant inflation target. By incorporating a trend inflation model with a regime switch, this study provides a novel framework for understanding how inflation expectations adjust specifically focusing on transitions during changes in monetary policy. Under FIRE, agents internalize the announced changes, revising their expectations downward until they align with the inflation target at the time of implementation. I then extend the model to incporate deciations from rational expectations using constant-gain learning. Under learning, the adjustment of inflation expectations and therefore inflation is gradual.

Second, I extend the theoretical framework by exploiting a natural experiment within the data—the introduction of Inflation Targeting (IT). Using subjective beliefs as outlined by Marcet and Sargent (1989a) and an event study methodology inspired by Borusyak et al. (2024), this paper measures the impact of IT announcements on inflation expectations and observed inflation. I employ adaptive learning, specifically through a constant-gain learning model, to estimate the effect of IT on expectations. This model, which captures agents' responsiveness to new information, is particularly well-suited for analyzing belief adjustments following a monetary policy regime change. Adaptive learning models are known to replicate key properties of expectations and macroeconomic aggregates, as documented by Carvalho et al. (2023).

Third, much of the existing literature assumes rational expectations or relies on high-frequency financial data, such as term premia or forward interest rates, to infer inflation expectations (Gürkaynak et al., 2010a). I, however, take a different approach by utilizing survey data that directly captures inflation expectations. Specifically, I use data from the Ifo World Economic Survey, which gathers six-month-ahead inflation expectations from professional forecasters across 32 Inflation Targeting economies between 1991:Q1 and 2019:Q4. By leveraging this dataset, the study provides a direct measurement of inflation expectations, capturing the beliefs of economic agents more accurately.

The empirical findings yield three key insights: First, inflation expectations do not respond to the announcement of a new monetary policy regime - a surprising result given that the survey respondents are professional forecasters. Second, observed inflation declines following the introduction of IT. Third, the decline in inflation is more pronounced in countries with price stability as their sole objective.

By combining the theoretical and empirical results together, this study challenges the conventional wisdom of NK models by showing that Inflation Targeting, while effective in lowering realized inflation, does not immediately anchor inflation expectations, even among professional forecasters. Specifically, it questions the traditional view in New Keynesian models that expectations lead observed inflation. This finding suggests that the link between policy announcements and expectations formation is weaker than previously thought, particularly in the context of adaptive learning models.

Related Literature This paper contributes to three primary strands of literature: the formation of inflation expectations, the macroeconomic impacts of Inflation Targeting (IT), and the credibility of central banks.

This study directly contributes to the literature on inflation expectations, focusing on how agents form beliefs in response to monetary policy changes, particularly during regime transitions—a topic that has been under explored, especially in the context of adaptive learning. Key contributions in this area include Marcet and Sargent (1989b) and Evans and Honkapohja (2012), who suggest that agents behave like econometricians, using past information to forecast future economic conditions. This paper is unique in studying how far back agents look to form expectations before and after a policy change. Previous research has documented deviations from the Full Information Rational Expectations (FIRE) framework among professional forecasters and other types of agents (Mankiw et al., 2003; Erceg and Levin, 2003; Eusepi and Preston, 2011; Coibion and Gorodnichenko, 2015; Coibion et al., 2018; Bordalo et al., 2020; Carvalho et al., 2023; Gáti, 2023). However, these studies generally assume that inflation expectations always play a critical role in inflation dynamics and do not focus on the formation of expectations around regime changes. To the best of my knowledge, this is the first paper to address this question under adaptive learning.

Unlike traditional models that assume agents possess perfect knowledge of the economic structure (as in Rational Expectations (RE)), adaptive learning frameworks allow for more realistic, gradual belief adjustments. This better captures the uncertainty and information processing that agents experience in real-world economies during periods of policy change.

Second, while a significant body of literature has examined the macroeconomic implications of Inflation Targeting (IT) on variables such as GDP and inflation, there is relatively little work on how changes in policy directly affect inflation expectations. Seminal works by Cecchetti and Ehrmann (1999), Ball and Sheridan (2004), and Levin et al. (2004) provide foundational insights into the broader economic impacts of IT. However, most of the research on policy changes and expectations has relied heavily on high-frequency financial data, such as term premia or forward interest rates, rather than survey data (for instance, (Gürkaynak et al., 2010b,a)). Moreover, much of this work has been conducted under the assumption of Rational Expectations (RE) (example, Johnson (2002)) , with limited exploration of how expectations form and evolve in response to policy changes under deviations from RE. For instance, Coibion et al. (2020) discuss the role of Average Inflation Targeting (AIT) on household expectations, but their findings are constrained by the scope of the policy application. This study distinguishes itself by systematically comparing survey data across a broad set of countries with varying inflation histories and economic stability, offering a more direct measurement of expectations and a comprehensive analysis using all available data.

Third, this paper contributes to the literature on the credibility of central banks. Previous studies, such as Kostadinov and Roldán (2020) and King and Lu (2022), model scenarios where agents infer the policymaker's type based on post-regime change policies. Unlike these studies, this paper assumes the new regime is publicly announced and known to all economic agents. Moreover, the above papers do not use survey evidence to support their findings nor do they account for transitions. The empirical results in this paper support the finding in Duggal and Rojas (2023) which highlights agents use observed inflation and the announced inflation target to update their beliefs.

Overall, this paper not only fills critical gaps in the existing literature, particularly regarding how agents adjust expectations during regime transitions, but also offers a new empirical approach by incorporating survey data from a wide array of economies with diverse inflationary histories. Most notably, while previous studies have focused on either theoretical modeling of inflation expectations or empirical analyses in stable regimes, this study integrates both approaches, offering a comprehensive examination of how expectations evolve during regime changes by leveraging adaptive learning models.

Road map The paper is organised as follows. Section two discusses the model of expectations explored in the paper. Section three delineates the data and its properties. Section four presents the empirical framework and results. Section five encompasses robustness checks using different definitions and estimators. Finally, section six concludes with directions for further research.

2 Agents' Expectations

Before turning to the empirics, it is important to have a framework in mind, which can be used to interpret the results of the empirical framework. The paper specifically builds on two frameworks which are later tested. First, is the standard rational expectations framework which will provide the basis for how expectations should react when there is a change in the monetary policy regime. The second is adaptive learning based on Marcet and Sargent (1989a) and Evans et al. (2001).

2.1 NK Model of announcement under FIRE

I use a New Keynesian model à la Galí (2015) to highlight how expectations adjust when there is an announced (anticipated) change in the monetary policay regime. Given that the inflation target in all economies is non-zero, the NK model requires an additional component of trend inflation based on Ascari and Sbordone (2014). In addition, the assumption of Full Information Rational Expectations (FIRE) holds for the expectations in this model. This implies $\mathbb{E}_t\pi_{t+1} = \pi_t$. The building blocks of the model are as follows,

Households The demand side of the model features a representative household which maximizes an intertemporal utility function separable in consumption (C_t) and labour supply (N_t).

$$\mathbb{E}_t \sum_{j=0}^{\infty} \beta^j \Big[\frac{C_{t+j}^{1-\sigma}}{1-\sigma} + \Psi \frac{N_{t+j}^{1+\phi}}{1+\phi}\Big] \tag{1}$$

subject to the per-period budget constraint given by,

$$P_t C_t + (1+i_t)^{-1} B_t = W_t N_t + D_t + B_{t-1} \tag{2}$$

Where, i_t is the nominal interest rate, B_t is the holding of per period bonds, D_t are distributed dividends (profits), Ψ is the utility weight on hours worked, σ is the intertemporal elasticity of substiution in consumption, and ϕ is the Frish elasticity of labour supply. Maximizing (1) subject to (2) yields the following Euler equation,

$$\frac{1}{C_t^{\sigma}} = \beta \mathbb{E}_t \Big[\Big(\frac{P_t}{P_{t+1}}\Big)(1+i_t)\Big(\frac{1}{C_{t+1}^{\sigma}}\Big)\Big] \tag{3}$$

and the intratemporal condition between C_t and N_t is given by,

$$w_t \equiv \frac{W_t}{P_t} \Psi N_t^{\phi} C_t^{\sigma} \tag{4}$$

Monetary Policy: Interest Rate Rule The key component of the model for the purpose of this paper is the monetary policy rule. I use a simple rule where the nominal interest rate i_t is determined as follows,

$$i_t = \bar{\pi}_t + \phi_\pi(\pi_t - \bar{\pi}_t) + \phi_y \hat{Y}_t + \vartheta_t \tag{5}$$

Here, $\bar{\pi}_t$ is the trend inflation, and is determined by the monetary policy regime being followed by the central bank. ϕ_π and ϕ_y are non-negative parameters which weight the deviation from trend inflation and output, respectively, ϑ_t is a monetary policy shock.

Trend Inflation and the Inflation Target The trend inflation component is now a function of a past inflation policy π_{t-1} and π^T which is the inflation target set by the central bank.

$$\bar{\pi}_t = (1-\zeta)\pi_{t-1} + \zeta\pi^T \tag{6}$$

Here, ζ is the parameter which controls the regime the central bank is following. If $\zeta = 0$ then the central bank is not following an inflation targeting regime. It could be following any regime which is indexed to past inflation. On the other hand, if $\zeta = 1$ the central bank now has an explicit inflation target which is to be achieved in every period.

Technology In each period t, a final good, Y_t is produced by a perfectly competitive firm, which combines output from intermediate good producers whose output is given by, $Y_{i,t}$ $\forall i \in (0,1)$, via the techology,

$$Y_t = \Big[\int_0^1 Y_{i.t}^{\frac{\epsilon-1}{\epsilon}} di\Big]^{\frac{\epsilon}{\epsilon-1}} \tag{7}$$

The price associated with the final good is a CES aggregate price $P_{i,t}$ given by,

$$P_t = \Big[\int_0^1 P_{i.t}^{1-\epsilon} di\Big]^{\frac{1}{1-\epsilon}} \tag{8}$$

Therefore the demand schedule for each intermediate good $Y_{i.t}$ is given by,

$$Y_{i,t} = \Big(\frac{P_{i,t}}{P_t}\Big)^{-\epsilon} Y_t \tag{9}$$

These intermediate goods are produced with a linear techmology, where the only input is labour,

$$Y_{i.t} = A_t N_{i,t}^{1-\alpha} \tag{10}$$

Here, A_t is a stationary process for aggregate technology. I assume the marginal cost is the same for each firm because of constant returns to scale technology and the fact that wages are set in a perfectly competitive market. Thus, marginal cost is given by,

$$MC_{i,t} = MC_t = \frac{W_t}{A_t P_t} \tag{11}$$

Price Setting Given there is imperfect substitutability with implies market power for intermediate goods. I assume the Calvo price setting behaviour for the intermediate good producers. This implies, that nominal price can be re-optimised with a probability $(1-\theta)$, while with probability θ the price remains unchanged from the previous period. Therefore, the problem of firm i, which sets a price at time t, is to choose $P^*_{i,t}$ to maximise expected profits,

$$\mathbb{E}_t \sum_{j=0}^{\infty} \theta^j \underbrace{\beta^j \frac{\lambda_{t+j}}{\lambda_0}}_{D_{t,t+j}} \Big[\underbrace{\frac{P^*_{i.t}}{P_t}}_{p^*_{i,t}} Y_{i,t+j} - \underbrace{\frac{W_{i.t+j}}{P_{i,t+j}} \frac{Y_{i,t+j}}{A_{t+j}}}_{TC_{i,t+j}} \Big] \tag{12}$$

subject to the following constraints,

$$Y_{i,t+j} = \Big[\frac{P^*_{i,t}(\bar{\pi}_t^{\chi j})^{1-\mu}(\Pi^{\chi}_{t-1.t+j-1})^{\mu}}{P_t} \Big] Y_{i,t+j} \tag{13}$$

and

$$\Pi_{t+j} = \begin{cases} 1 \text{ if } j = 0 \\ \Big(\frac{P_{t+1}}{P_t} \times \cdots \times \frac{P_{t+j}}{P_{t+j-1}}\Big) \text{ if } j \geq 1 \end{cases} \tag{14}$$

Π_{t+j} is the cumulative gross inflation rate over j periods. In the maximization problem, $D_{t,t+j}$ is the stochastic discount factor, $p^*_{i,t+j}$ is the relative price level of the optimizing firm at t and $TC_{i,t+j}$ is the total cost for each firm. Following, Christiano et al. (2005), and Yun (1996) I assume that when a firm cannot reoptimize its price (with probability θ), it can costlessly adjust its price according to an indexation rule that depends on past inflation and on the inflation target, which collectively imply trend inflation in this model. Therefore, the optimzation problem of the firm can be re-written as:

$$\mathbb{E}_t \sum_{j=0}^{\infty} \theta^j \beta^j \frac{\lambda_{t+j}}{\lambda_0} \Big[\frac{P^*_{i,t} (\bar{\pi}_t^{\chi j})^{1-\mu} (\Pi^{\chi}_{t-1.t+j-1})^{\mu}}{P_t} Y_{i,t+j} - \frac{W_{i.t+j}}{P_{i,t+j}} \frac{Y_{i,t+j}}{A_{t+j}} \Big] \tag{15}$$

The optimal pricing function then is given by the first order condition and is written as:

$$\left(\frac{P^*_{i,t}}{P_t}\right)^{1+\frac{\epsilon\alpha}{1-\alpha}} = \frac{\frac{\epsilon}{1-\alpha}}{\epsilon - 1} \frac{\mathbb{E}_t \sum_{j=0}^{\infty} (\theta\beta)^j \lambda_{t+j} \frac{W_{t+j}}{P_{t+j}} \left[\frac{Y_{t+j}}{A_{t+j}}\right]^{\frac{1}{1-\alpha}} \left[\frac{(\bar{\pi}_t^{\chi j})^{1-\mu} (\Pi^{\chi}_{t-j,t+j-1})^{\mu}}{\Pi_{t+j}}\right]^{\frac{-\epsilon}{1-\alpha}}}{\mathbb{E}_t \sum_{j=0}^{\infty} (\theta\beta)^j \lambda_{t+j} \left[\frac{(\bar{\pi}_t^{\chi j})^{1-\mu} (\Pi^{\chi}_{t-j,t+j-1})^{\mu}}{\Pi_{t+j}}\right]^{1-\epsilon} Y_{t+j}} \tag{16}$$

Here, $\lambda_{t+j} = u_c = C_t^{-\sigma}$. Where, $\chi \in [0,1]$ is the degree of price indexation, $\mu \in [0,1]$ allows for any degree of a combination between the two types of indexation, to trend inflation and to past inflation rates. Moreover, using the market clearing conditions, we have that $C_t^{-\sigma} = Y_t^{-\sigma}$.

$$(p^*_{i,t})^{1+\frac{\epsilon\alpha}{1+\alpha}} = \frac{\epsilon}{(\epsilon-1)(1-\alpha)} \times \frac{\mathbb{E}_t \sum_{j=0}^{\infty} \theta^j D_{t+j} Y_{t+j} MC_{t+j} \Pi^{\epsilon}_{t+j}}{\mathbb{E}_t \sum_{j=0}^{\infty} \theta^j D_{t+j} Y_{t+j} \Pi^{\epsilon-1}_{t+j}} \tag{17}$$

Using equation 16 I can now write the optimal pricing function recursively as follows,

$$(p^*_{i,t})^{1+\frac{\epsilon\alpha}{1-\epsilon\alpha}} = \frac{\epsilon}{(\epsilon-1)(1-\alpha)} \frac{\psi_t}{\varphi_t} \tag{18}$$

Where, φ_t and ψ_t are given as follows,

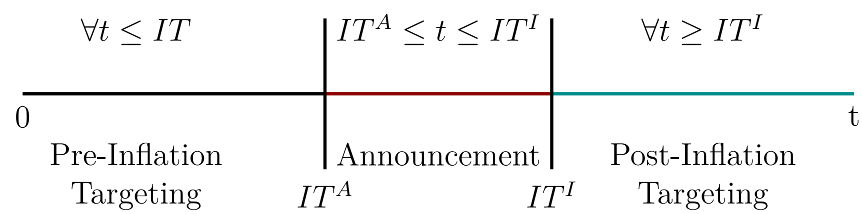
$$\psi_t = w_t A_t^{\frac{-1}{1-\alpha}} Y_t^{\frac{1}{1-\alpha}-\sigma} + \theta\beta \bar{\pi}_t^{-\frac{\epsilon(1-\mu\chi)}{1-\alpha}} \pi_t^{\frac{-\mu\chi\epsilon}{1-\alpha}} \mathbb{E}_t \pi_{t+1}^{\frac{\epsilon}{1-\alpha}} \psi_{t+1} \tag{19}$$

$$\varphi_t = Y_{t-1}^{1-\sigma} + \theta\beta \bar{\pi}_t^{(1-\mu)(1-\epsilon)\chi} \pi_t^{\chi\mu(1-\epsilon)} \mathbb{E}_t \pi_{t+1}^{\epsilon-1} \varphi_{t+1} \tag{20}$$

ψ_t and φ_t are the discounted value of marginal costs, and marginal revenues, respectively. The aforementioned equations complete the formulation of the model economy with a demand side, supply side, and monetary policy rule. Let us now turn to describing the changes that occur in the model when a new monetary policy regime is introduced.

Regime Change There are two changes that occur in this model when the monetary policy framework changes to the Inflation Targeting Framework. First, in $t \leq IT^I$, trend inflation is π_{t-1} whereas in period $t \geq IT^I$ trend inflation is assumed to be π^T. Since $\zeta = 0$ when $t \leq IT^I$ and 1 otherwise. Figure 3 provides an overview of the structural change taking place. At time $t = IT^I$ the economy will adopt Inflation Targeting as their monetary policy framework. This change is annoounced in period $t = IT^A$ and therefore, anticipated by the agents of the economy. Once IT has been adopted as the monetary policy framework, no further structural changes take place. Therefore, there is only one structural change in the economy at time $t = IT^I$.

Figure 3: Timing of the model



Full Information Rational Expectations The FIRE approach assumes that economic agents have complete knowledge of the economy. Specifically, they do not have any incomplete or noisy information and have model consistent expectations. This implies that they are aware of the mapping between the fundamentals, and the values of the parameters. Therefore, in this economy, agents know that in period $t = IT^I$ the parameter ζ will be 1[2]. Consequently, agents know the path of inflation, and output and other macroeconomic variables conditional on knowing the shocks. This implies, firms are able to make changes to the way they index prices when they are unable to optimally reset the prices. Before IT, there is no policy set by the central bank, therefore, prices set by firms are indexed to past prices. This implies $\mu = \chi = 1$. Once the central bank has an inflation target, and firms internalize this in their price setting

[2]There is no ambiguity about when the changes will take place and what those changes will be. Another way to solve this problem would be to not know when the changes would occur, this however, would deviate from the case of full information.

behaviour, $\mu = \chi = 0$ as now firms index only to trend inflation, which is the inflation target set by the central bank.

Generalized NKPC The regime change described above implies a change in the price setting behavior and therefore, the Generalized New Keynesian Phillips Curve (GNKPC). Below, I provide the log-linearized versions derived from the trend inflation model for the two different regimes.

$$\hat{\pi}_t = \begin{cases} \frac{\left(1+\frac{\epsilon\alpha}{1-\alpha}\right)\left(\frac{\theta}{1-\theta}\right)}{\left(1+\frac{\epsilon\alpha}{1-\alpha}\right)\left(\frac{\theta}{1-\theta}\right)(1+\beta)}\hat{\pi}_{t-1} + \frac{\left(1+\frac{\epsilon\alpha}{1-\alpha}\right)\left(\frac{\theta\beta}{1-\theta}\right)}{\left(1+\frac{\epsilon\alpha}{1-\alpha}\right)\left(\frac{\theta}{1-\theta}\right)(1+\beta)}\mathbb{E}_t\hat{\pi}_{t+1} \\ +\frac{-(1-\theta\beta)(1-\sigma)+(1-\theta\beta)\left(\frac{\phi+1}{1-\alpha}\right)}{\left(1+\frac{\epsilon\alpha}{1-\alpha}\right)\left(\frac{\theta}{1-\theta}\right)(1+\beta)}\hat{Y}_t - \frac{(1-\theta\beta)\frac{\phi+1}{1-\alpha}}{\left(1+\frac{\epsilon\alpha}{1-\alpha}\right)\left(\frac{\theta}{1-\theta}\right)(1+\beta)}\hat{A}_t \text{ if } t \leq IT^I \\ \frac{(1-\theta\beta\bar{\pi}^{\frac{\epsilon}{1-\alpha}})\left(\frac{\phi+1}{1-\alpha}\right)-(1-\theta\beta\bar{\pi}^{\epsilon-1})(1-\sigma)}{\left(1+\frac{\epsilon\alpha}{1-\alpha}\right)\frac{\theta\bar{\pi}^{\epsilon-1}}{1-\theta\bar{\pi}^{\epsilon-1}}}\hat{Y}_t - \frac{(1-\theta\beta\bar{\pi}^{\frac{\epsilon}{1-\alpha}})\left(\frac{\phi+1}{1-\alpha}\right)}{\left(1+\frac{\epsilon\alpha}{1-\alpha}\right)\frac{\theta\bar{\pi}^{\epsilon-1}}{1-\theta\bar{\pi}^{\epsilon-1}}}\hat{A}_t \\ +\frac{\theta\beta\bar{\pi}^{\frac{\epsilon}{1-\alpha}}-\theta\beta\bar{\pi}^{\epsilon-1}}{\left(1+\frac{\epsilon\alpha}{1-\alpha}\right)\frac{\theta\bar{\pi}^{\epsilon-1}}{1-\theta\bar{\pi}^{\epsilon-1}}}\mathbb{E}_t\hat{\psi}_{t+1} + \frac{\frac{\epsilon}{1-\alpha}[\theta\beta\bar{\pi}^{\frac{\epsilon}{1-\alpha}}-\theta\beta\bar{\pi}^{\epsilon-1}]+\left(\frac{1+\epsilon\alpha}{1-\alpha}\right)\left(\frac{\theta\beta\bar{\pi}^{\epsilon-1}}{1-\theta\bar{\pi}^{\epsilon-1}}\right)}{\left(1+\frac{\epsilon\alpha}{1-\alpha}\right)\frac{\theta\bar{\pi}^{\epsilon-1}}{1-\theta\bar{\pi}^{\epsilon-1}}}\mathbb{E}_t\hat{\pi}_{t+1} \text{ if } t \geq IT^I \end{cases}$$

Where, $\hat{\psi}_{t+1}$ evolves as follows,

$$\hat{\psi}_t = (1-\theta\bar{\pi}^{\epsilon-1})\Big(\phi\hat{s}_t + (\phi+1)(\tilde{Y}_t - \tilde{Y} + \frac{1-\sigma}{\sigma+\phi}\hat{A}_t)\Big) + \theta\beta\hat{\pi}^{\epsilon}\Big[\mathbb{E}_t\psi_{t+1} + \epsilon\mathbb{E}_t\hat{\pi}_{t+1}\Big] \quad (21)$$

Before the policy is announced, inflation is determined by past inflation ($\hat{\pi}_{t-1}$), the output gap ($\hat{Y}_t$), and inflation expectations ($\mathbb{E}_t\hat{\pi}_{t+1}$). After the policy announcement, inflation becomes a function of the inflation target ($\bar{\pi}$) and a new term, ψ_t, which captures the evolution of future marginal costs. Comparing the pre- and post-announcement equations reveals that the backward-looking component of the GNKPC is replaced with more forward-looking behavior. This shift is crucial for understanding how inflation adjusts under the new regime. Under FIRE, firms will have full knowledge of the precise changes in inflation dynamics, allowing them to adjust their pricing behavior immediately in response to the announced policy change.

Generalzed NK Model with FIRE and announcement Let's now put the pieces of the model together. First, the demand side of the economy given by the log-linearized Euler equation

$$\hat{Y}_t = \mathbb{E}_t\hat{Y}_{t+1} - \frac{1}{\sigma}(i_t - \mathbb{E}_t\pi_{t+1}) \tag{22}$$

Next the monetary policy rule given by,

$$i_t = \begin{cases} \pi_{t-1} + \phi_\pi(\pi_t - \pi_{t-1}) + \phi_y\hat{Y}_t + \vartheta_t \text{ for } t \leq IT^I \\ \pi^T + \phi_\pi(\pi_t - \pi^T) + \phi_y\hat{Y}_t + \vartheta_t \text{ for } t \geq IT^I \end{cases} \tag{23}$$

Finally, the supply side of the economy given by the log-linearized New Keynesian Phillips Curve in terms of the output.

$$\hat{\pi}_t = \begin{cases} f(\pi_{t-1}, \hat{Y}_t.\hat{A}_t, \mathbb{E}_t\pi_{t+1}) \text{ if } t \leq IT^I \\ f(\bar{\pi}, \hat{Y}_t.\hat{A}_t, \mathbb{E}_t\pi_{t+1}, \mathbb{E}_t\psi_{t+1}) \text{ if } t \geq IT^I \end{cases} \tag{24}$$

The changes in the model due to the introduction of the changes in the monetary policy rule and the change in the price setting behavior for firms who cannot optimise prices leads to the switch in equations (23) and (24). These changes in the NKPC are the result of firms internalizing the policy changes in their optimising behaviour through the structural parameters χ, μ which are the degree of indexation and the degree of indexation between past inflation and trend inflation. Finally, the monetary policy rule i_t becomes a function of ζ which controls the switch in the policy. Based on the Generalised NK model, I can now solve for the transition path of expectations from no IT to IT.

Solution Method To solve for the path of expectations and inflation in the presence of a structural change, I follow the literature on solving linear rational expectations models with gradual changes in regimes (Cagliarini and Kulish (2013); Kulish and Pagan (2017)). This method involves writing the model in a state-space formulation and using the method of undetermined coefficients to solve backward from the point of regime change. Unlike earlier work that focuses on disinflation policies, my model specifically addresses a regime shift from a 'no rule' state to an explicit inflation target. This transition is distinct because it examines the adjustment of expectations when there is no established target to anchor beliefs initially, a scenario that has received less attention in the literature. While previous studies have primarily dealt with gradual policy changes, my model captures the dynamics of moving from an undefined policy regime to a structured framework with a clear inflation target, allowing for the analysis of both the announcement and implementation phases of such a regime shift.

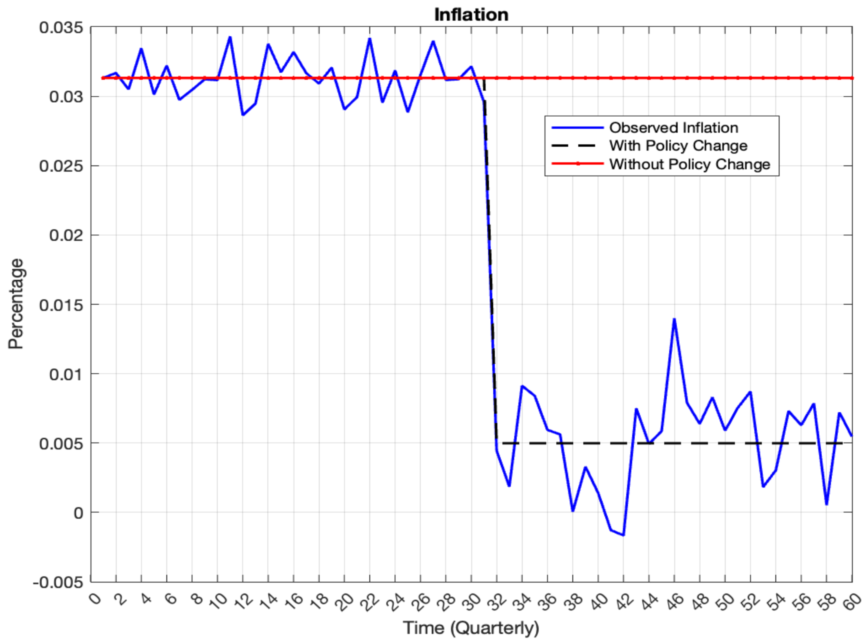
Given agents have rational expectations changes that occur at IT^I are known at IT^A. This implies agents know that the underlying economic structure of the economy will change. Thus, from $t = IT^A$ to $t = IT^I - 1$, agents know that the economic structure follows the form $A_0 y_t = C_0 + A_1 y_{t-1} + B_0 \mathbb{E}_t y_{t+1} + D_0 \epsilon_t$. After $t = IT^I$, the structure shifts to $A^{IT} y_t = C^{IT} + A^{IT} y_{t-1} + B^{IT} \mathbb{E}_t y_{t+1} + D^{IT} \epsilon_t$. Here, y_t represents a vector of 10 endogenous variables, including $\pi_t^T, \hat{Y}_t, \hat{\pi}_t, \hat{\psi}_t, \hat{\varphi}_t, \hat{s}_t, N_t, w_t, i_t, \bar{\pi}$, and ϵ_t represents two exogenous shocks $\varepsilon_t^a, \varepsilon_t^\vartheta$. I use this setup to solve for the transition path, balancing computational efficiency with model complexity.

Table 1: Parameters for the GNK with FIRE

Parameter	Parameter Interpretation	Value
β	Subjective discount factor	0.99
σ	Elasticity of marginal utility of consumption	1
ϕ	Elasticity of Labour Supply	1
θ	Probability of price re-adjustment	0.75
ϵ	Dixit-Stiglitz elasticity of substitution among goods	10
α	Returns to Scale parameter	0
χ	Degree of Price indexation	{0, 1}
μ	Substitutability between types of price indexation	{0, 1}
ϕ_π	Weight on deviations of inflation from the target	1.5
ϕ_y	Weight on the Output gap	0.5
π^T	Inflation Target	2% (Annulized)
ζ	Governs trend inflation	{0, 1}

I now solve the model under rational expectations to show how expectations adjust accordingly. Table 1 provides the baseline parameter values which allow for a tractable solution to the model proposed. Since, agents have rational expectations in the model, $\mathbb{E}_t \pi_{t+1} = \pi_t$. To match the data, the timing for the model is quarterly with the inflation target set to 0.005. The announcement in the model is made in period $t = 32$, with the policy being implemented in $t = 40$. This timing is set to match the typical time between the announcement and implementation of IT in the data.

Figure 4: Change in Expectations after an announcement



Note: The graph represents how expectations evolve over the change in regime. The blue line represents the change in inflation, and inflation expectations following the introduction of the Inflation Targeting. The red and black line show the steady state levels of inflation, prior to and post the introduction of IT.

Figure 4 demonstrates the immediate adjustment of inflation expectations following a monetary policy announcement that shifts to an Inflation Targeting framework. In this setting, agents operate under rational expectations, with full credibility granted to the central bank and a strong commitment to the new policy. This credibility enables agents to fully internalize the policy change as soon as it is announced, leading to an immediate adjustment (or "jump") in inflation expectations. The adjustment occurs because firms alter their price-setting behavior: instead of indexing prices to past inflation, they now base their pricing on the central bank's newly announced inflation target. This forward-looking behavior means that both inflation and inflation expectations converge rapidly to the target level, effectively aligning with the policy objective at the announcement stage itself, without any delay between the announcement and policy implementation. This dynamic underscores the powerful role that credible policy announcements can play in shaping inflation outcomes through agents' expectations.

Given that rational expectations does not hold in the data, particularly for inflation expectations, as documented by Mankiw et al. (2003), Eusepi and Preston (2011), Coibion and Gorodnichenko (2015). In the following section I now present an alternative rule for the formation of beliefs based on which I will conduct an event study to discern the effect of a change in monetary policy on expectations.

2.2 Subjective Expectations

There is sufficient literature which documents the deviation of inflation expectations from the rational expectations hypothesis (REH)[3]. While there are several competing hypotheses about how expectations deviate from the REH, I assume that agents form expectations using a constant gain learning model. The choice of the learning model is based on two criteria. First, the gain parameter, which measures the speed at which agents learn, is able to track structural changes in the economy. Second, learning models replicate a fact documented by Coibion and Gorodnichenko (2015) - forecast errors are correlated to forecast revisions. Branch and Evans (2006) also demonstrate that a constant gain learning model (relative to other recursive forecasting models) provides the best in-sample and out-of-sample fit for the survey of professional forecasters. Finally, unlike the rational expectations counterpart, learning models do not impose a knowledge structure on the agents. That is, agents do not know the underlying structural model of the economy and behave as econometricians to predict future inflation.

Therefore, the benchmark assumption is that agents perceive inflation to evolve according to,

$$\pi_{t+1} = \beta_{t+1} + \epsilon_{t+1} \tag{25}$$

where, ϵ_{t+1} denotes a transitory shock to inflation and β_{t+1} a persistent inflation growth component that drifts slowly over time according to,

$$\beta_{t+1} = \beta_t + \eta_{t+1} \tag{26}$$

To simplify the model, I assume that agents perceive both innovations, ϵ_t and η_t, to follow independent normal distributions, $\epsilon_t \sim \mathcal{N}(0, \sigma_\epsilon^2)$ and $\eta_t \sim \mathcal{N}(0, \sigma_\eta^2)$, respectively. Therefore, the innovations are independent of each other and imply $\mathbb{E}[(\epsilon_t, \eta_t)|\mathcal{I}_{t-1}] = 0$. Since agents observe inflation, but do not separately observe the persistent and transitory components driving it, the previous setup defines a filtering problem in which

[3]For instance, Branch and Evans (2006), Eusepi and Preston (2011), Coibion and Gorodnichenko (2015), Branch and Evans (2017)

agents need to decompose observed inflation into its persistent and transitory elements, so as to forecast optimally. This unobserved component model gives rise to an optimal filtering problem.

To characterize this problem, I specify the prior beliefs at $t = 0$ about the persistent component as follows

$$\beta_0 \sim \mathcal{N}(\tilde{\beta}_0, \sigma_\beta^2) \tag{27}$$

where, the value of the prior uncertainty σ_β^2 is assumed to be equal to the steady state Kalman filter value. The optimal filtering then implies that posterior beliefs following some history $\mathcal{I}_t$ are given by (28),

$$\beta_t | \mathcal{I}_t \sim \mathcal{N}(\tilde{\beta}_t, \sigma_\beta^2) \tag{28}$$

with

$$\tilde{\beta}_t = \tilde{\beta}_{t-1} + \kappa(\pi_t - \tilde{\beta}_{t-1}) \tag{29}$$

$$\kappa = \frac{\sigma_\beta^2 + \sigma_\eta^2}{\sigma_\beta^2 + \sigma_\eta^2 + \sigma_\epsilon^2} \tag{30}$$

Where, κ gives the strength at which agents update their beliefs. Agents' beliefs are thus parsimoniously summarized by the single state variable, $\tilde{\beta}$ describing the agents' degree of credibility about change inflation following the introduction of the new policy.

2.3 NK Model of Announcement under Learning

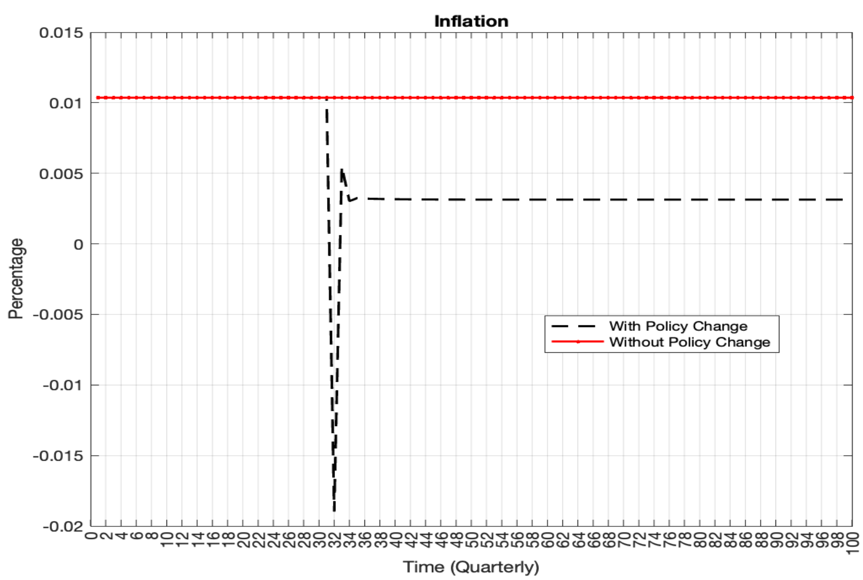
In this section, I present the results from the New Keynesian (NK) model with trend inflation, structural change (as outlined in Section 2.1), and adaptive learning. The expectations rule follows a constant-gain learning model, as described in Section 2.2, where agents continuously update their expectations based on past forecast errors. This model framework is chosen to capture how gradual adjustments in expectations influence realized inflation over time.

Figures 5 and 6 illustrate the model's predictions for both realized inflation and inflation expectations under this adaptive learning framework. The figures reveal that when agents' expectations are modeled as a weighted combination of prior-period expectations and forecast errors, a gradual adaptation process emerges. This dynamic results in a smoother adjustment of inflation expectations and subsequently of realized inflation, as opposed to the immediate adjustment under rational expectations.

Upon the announcement of the policy, the model predicts an initial decline in expectations, yet this adjustment does not immediately reach the announced inflation target. Instead, expectations start to decrease gradually, with the initial adjustment being more pronounced. This initial shift drives a significant initial decline in realized inflation as well, reflecting agents' response to the anticipated policy change.

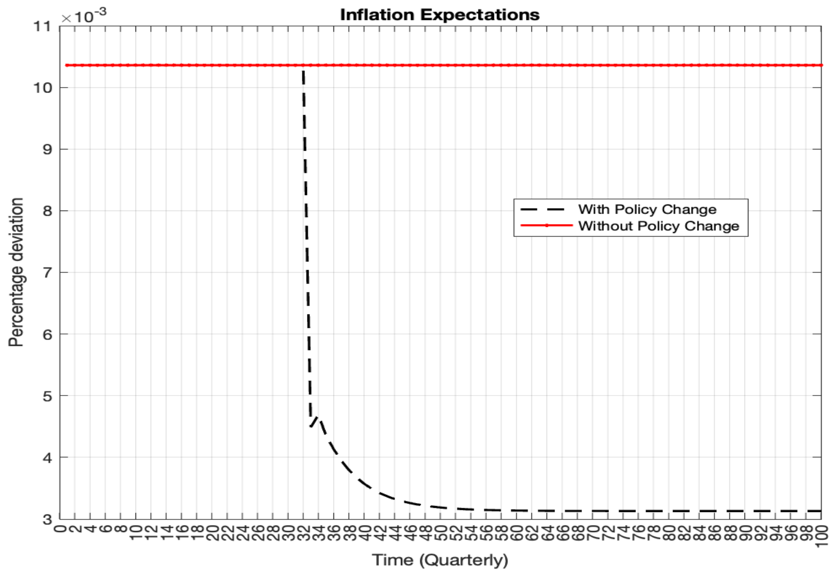
However, as each period progresses, the speed of expectation adjustment slows, creating a pattern of diminishing responsiveness as agents adapt incrementally. This deceleration reflects the adaptive learning mechanism, where expectations adjust only partially in response to new information, becoming progressively closer to the target as more information is incorporated over time. By the implementation period, expectations converge to the target, completing the gradual transition predicted by the model. The decline in inflation thus becomes imperceptibly small and it takes much longer for inflation to reach the target level.

Figure 5: Change in Observed Inflation after an announcement



Note: The graph presents the gradual adjustment of inflation when agents are learning. The red and black line represent changes to inflation prior to and post the policy change, respectively. Prior inflation has been exagerated to show the path of inflation.

Figure 6: Change in Expectations after an announcement



Note: The graph represents the path of inflation expectations when agents are learning. The red and black line represent changes to inflation prior to and post the policy change, respectively. The gain parameter $\kappa = 0.2$ for this simulation.

Building on the results from the model with adaptive learning, I now formulate a testable hypothesis for inflation expectations in the empirical analysis. The adjustment of expectations can thus be summarized in the following expression:

$$\beta_t < \beta_{t-1} + \kappa(\pi_t - \beta_{t-1}) + \omega_t \tag{31}$$

where $\omega_t < 0$ for $t_A \leq t < t_I$. Here, β_t represents agents' inflation expectations at time t, β_{t-1} are expectations from the previous period, and $(\pi_t - \beta_{t-1})$ is the forecast error from the prior period. This hypothesis incorporates a time-varying adjustment term, denoted ω_t, which reflects the incremental shifts in expectations over time, particularly distinguishing between the announcement and implementation phases of policy changes. In this framework, ω_t serves as an adjustment factor that enables expectations to evolve gradually rather than responding instantaneously. This term captures the stepwise decline in expectations as observed in the model, aligning with the concept of gradual learning in response to new information.

At the announcement date, $t = IT^A$, agents' inflation expectations begin to adjust downward from a higher initial level, say 10%, toward the inflation target of 2%. However, rather than an immediate shift, the adjustment may be gradual: ω_t varies over time to reflect this phased adjustment. For example, immediately following the announcement, expectations might shift modestly from 10% to 7% as agents begin to internalize the policy direction. Over the next few periods, expectations continue to decline, moving from 7% to 5%, then to 4%, and ultimately converging to the target of 2% just before the implementation date $t = IT^I$. This gradual adjustment is captured by a sequence of ω_t values, each smaller than the previous period's adjustment, which incrementally reduces the gap between expectations and the target rate.

The time-varying nature of ω_t thus provides the model with flexibility, allowing expectations to respond incrementally to the policy announcement rather than in a single, large adjustment. This design accommodates the realistic feature that agents may be backward-looking or cautious, updating their expectations in steps rather than in a single leap, especially when shifting from a high initial level of inflation expectations.

To capture the average treatment effect and align the theoretical model with the empirical approach, I introduce a second variable, ω_s, where $s = t - IT^A$ represents the number of periods since the announcement. Defined as the average adjustment in expectations across countries treated at each horizon s, ω_s allows us to observe how expectations adjust over time in response to the policy change. This formulation reflects the cumulative effect of the announcement across successive horizons, paralleling the time-varying treatment effect estimated in the empirical analysis.

The introduction of ω_s as a horizon-specific adjustment term is crucial for isolating the effect of the policy announcement on inflation expectations. By focusing on horizons s—periods since the announcement—rather than calendar time t, I control for background trends and capture the unique impact of the policy change, separate from other time-specific shocks. This approach is particularly relevant given the staggered adoption of Inflation Targeting across countries in my dataset. Since each country's announcement date differs, measuring effects by horizon enables a consistent comparison across countries relative to their individual adoption timings. This structure standardizes the analysis across countries and allows us to examine the cumulative impact of the announcement on expectations, regardless of varied adoption dates.

At $s = 0$ (the announcement period $t = IT^A$), the adjustment ω_s is at its peak, indicating the initial, largest response of agents' expectations to the announcement. As we move forward from the announcement, the size of the adjustment ω_{s+i} diminishes with each successive period s, representing a progressively smaller change as expectations approach the target level. For example, at $s = 0$, expectations might adjust downward by 3 percentage points; at $s = 1$, they adjust by 2 percentage points; at $s = 2$, the adjustment reduces to 1 percentage point, and so on, until at $s = 8$, the adjustment is minimal, with $\omega_{IT^I} = 0$. This setup allows us to model expectations as gradually moving toward the target, consistent with the empirical average treatment effect of the announcement over time.

3 Data

3.1 Data on Forecasts

The survey measure used comes from the Ifo World Economic Survey which is a survey of professional forecasters. The survey collects information about various variables such as current and future economic situation of a country, inflation and GDP expectations etc. The survey collects qualitative responses (+) for a positive assessment, (=) for a neutral assessment, and (−) for a negative assessment. These responses are then converted to point estimates for each country. The individual replies are combined for each country without weighting as an arithmetic mean of all survey responses in the respective country. The computation of the point estimates is as follows:

$$B_{i,t} = 100 \times \frac{(+_{it} - (-_{it}))}{N_{it}} \tag{32}$$

The equation above computes the difference between the positive and negative responses as a share of the total number of responses to arrive at the final point estimates. The final point estimates are used for the analysis in this paper.

The data set includes a set of 32 Inflation Targeting countries covering the periods from 1991Q1 - 2019Q4 (the last year of the survey). The range of the countries in the data set span advanced economies such as the United States, Japan, and Germany. On the other hand, it also includes developing economies such as Brazil, Chile, and India. The range of countries used enables a systematic review of the impact of IT on inflation expectations.

In addition to the survey of professional forecasters, I compile data on realized annualized quarterly inflation from the IMF International Financial Statistics. Moreover, for most countries the announcement date of the policy change are not known. I compile the announcement dates from the minutes of central bank monetary policy committee meetings to check when the central banks first discussed moving to an interest rate based rule or Taylor based rule or Inflation Targeting, explicitly. Given, that the survey respondents in my dataset are professional forecasters and have access to this information, using first discussion dates as the announcement dates act as identification for any possible anticipation. Typically, the announcement date is roughly four years before the implementation date of the policy.

3.2 Properties of Forecasts

Tables F.3 - F.14 summarize the key statistics (mean, standard deviation, and persistence) for inflation, inflation expectations, and forecast errors. The results are split between the period of the policy announcement and its implementation. Additionally, given that central banks typically use inflation targeting (IT) to anchor expectations over the medium to long term, the statistics are also presented for the five years preceding and following both the announcement and implementation. The forecasts have a rolling six-month-ahead horizon.

The summary statistics reveal a notable preliminary finding: forecast errors increase in many countries following the adoption of inflation targeting. This trend holds for the entire sample and is particularly pronounced in the five years after IT introduction. The persistence of forecast errors, even with a policy designed to enhance credibility, suggests two potential insights. First, inflation expectations may deviate from the rational expectations framework. Second, the transmission of monetary policy may not primarily operate through inflation expectations. To disentangle whether expectations follow the rational expectation hypothesis, I run a test to check if current information can predict forecast errors.

3.2.1 Rational Expectation Hypothesis

If surveys about inflation expectations convey information about true expectations of future inflation, then it is possible to construct a test that verifies whether the Rational Expectation Equilibrium (REE) holds in the data. Under the Rational Expectation Hypothesis (REH) forecast errors must be orthogonal to all the information that is available and relevant to the agents at the moment of making the forecasts. However, if agents form beliefs about inflation according to adaptive expectations then, the forecasting errors may not necessarily be orthogonal to the information agents use to form their forecasts.

This paper follows Adam et al. (2017) and Kohlhas and Walther (2021) to perform the test for the rational expectation hypothesis. Let $E_t^{\mathcal{P}}$ and E_t denote the measure for subjective and rational expectations, respectively. Let $y_{t,t+h}$ denote the actual value of inflation in period $t+h$ and $E_t^{\mathcal{P}} y_{t,t+h}$ represent the forecast of inflation in period $t+h$, reported at time t. Therefore, the forecast error is given by $y_{t,t+h} - E_t^{\mathcal{P}} y_{t,t+h}$. Thus, a negative value of the difference would imply that agents are over-predicting inflation. Therefore, the test run to check the validity of the the hypothesis is the following,

$$y_{t,t+h} = \alpha_1 + \rho_1 y_{t-h,t} + \epsilon_t \tag{33}$$

$$E_t^{\mathcal{P}} y_{t,t+h} = \alpha_2 + \rho_2 y_{t-h,t} + \eta_t \tag{34}$$

Under the null of rational expectations, we would expect, $E_t^{\mathcal{P}} = E_t$. Thus, $H_0 : \rho_1 - \rho_2 = 0$. We can re-write equation (1) and (2) to perform a joint test for the REH. Thus the test is now augmented such that the null hypothesis is, $H_0 : \rho = 0$. Table 2 presents the results for the REH test for the panel data. For both the pre and post IT period, the test is rejected.

Table 2: REH Test, Panel Data

Variable	Pre-IT	Post-IT
Π_t	0.338***	0.142**
	(0.061)	(0.058)
Constant	-7.56***	-0.872***
	(1.77)	(0.167)

Note: The regression is of the forecast error in $t+h$ on inflation in period t. Newey West standard errors are reported in Parenthesis. The null hypothesis of $H_0 : \rho = 0$ is rejected for this sample. $*p < 0.10, **p < 0.05, ***p < 0.01$

Table G.15 provides the results for the REH test each country in the data set. The Newey West standard errors are reported along with the coefficient on inflation (ρ). The coefficient for all countries in both the periods is significantly different from zero. Thus, it is possible to reject the test for almost all countries for the pre and post targeting period.

4 The Role of Regime Changes

4.1 Empirical Framework

To estimate the treatment effect as described in (31), the paper uses the event study methodology based on Borusyak et al. (2024). Specifically, the regression is of the form

$$\pi^e_{it} = \underbrace{\delta_i}_{0} + \pi^e_{it-1} + \kappa(\pi_{it-1} - \pi^e_{it-1}) + D_{it}\tau_{it} + \epsilon_{it} \tag{35}$$

Where, i is each country, t is the time period, δ_i is the unobserved heterogeneity, π^e_{it} are the inflation expectations taken from the surveys of professional forecasters, π_{it} is the annualized quarterly inflation rate, D_{it} is a dummy variable that takes value 1 if IT is introduced in the economy, 0 otherwise, and τ_{it} is the treatment effect. $\epsilon_{it} \sim N(0, \sigma^2_\epsilon)$ and is orthogonal to all previous information.

Notice that equation (35) is the equivalent of (31) with τ_{it} as the regression coefficient for $\omega^A_{IT^A}$ for each i and t pair. This implies the regression specification is the updating equation of the agents' beliefs. The underlying assumption I make is that, inflation expectations follow the updating rule given my constant-gain learning. That is, beliefs today are a weighted average of beliefs in the previous period and the forecast errors committed in the previous period. An alternative way to interpret equation (35) is to think of constant gain learning akin to the normal returns in the Finance literature[4]. Thus, $(\pi^e_{it} - \hat{\pi}^e_{it-1})$ represents the "abnormal" expectations, allowing the measurement of the effect of the treatment.

Once each τ_{it} is estimated, it is used to compute the overall effect of the policy using weights. I detail the procedure for the computation of the treatment effect. To compute the effect of the change in the policy, the estimation needs to be done in three stages. Before describing the details, let us work through some notational details. Let $\{it : D_{it} = 1 \in \Omega_1\}$ be the set of observations that receive treatment (those periods where Inflation Targeting is active) and $\{it : D_{it} = 0 \in \Omega_0\}$ be the untreated observations (periods where Inflation Targeting is not active). Let τ_{it} be the effect of the policy on the variable of interest (π_{it}), and $\pi_{it}(0)$ be the potential outcome if the observations were not treated. In addition, let w_{it} be the weights attached to each unit in the computation of the treatment effect. Then, the treatment effect is computed based on the following,

[4] For instance, Fama et al. (1969)

1. **Estimate the Regression Coefficients for Untreated Observations**: For all untreated observations in the set Ω_0, compute the regression coefficients π^e_{it} using Ordinary Least Squares (OLS). Specifically, for this study, the regression is given by equation (35), which is used to estimate $\hat{\kappa}$, the constant gain parameter.

2. **Predict Counterfactual Expectations for Treated Observations**: For all treated observations in the set Ω_1 where $w_{it} \neq 0$, predict the counterfactual inflation expectations $\pi^e_{it}(0)$ using the equation $\pi^e_{it}(0) = \pi^e_{it-1} + \hat{\kappa}(\pi_{it} - \pi^e_{it-1}) + \epsilon_{it}$.

3. **Compute the Treatment Effect**: Calculate the treatment effect for each treated observation as $\tau_{it} = \pi^e_{it} - \pi^e_{it}(0)$. This gives the period- and unit-specific treatment effect.

4. **Aggregate the Treatment Effects Over Time**: Compute the average treatment effect for each relative time period after treatment using the weights $w_{ih} = \frac{1}{\sum_{i \in \Omega_{1,h}} N_i}$, where $\Omega_{1,h} = \{it : h = t - IT\}$ represents the set of observations with the same time since the policy adoption.

5. **Compute the Overall Treatment Effect**: The overall treatment effect for each horizon h is given by the weighted average $\tau_h = \sum_{i \in \Omega_{1,h}} w_{ih} \tau_{it}$, where the weights $w_{ih} = \frac{1}{\sum_{i \in \Omega_{1,h}} N_i}$ ensure that the treatment effects are properly averaged across observations at each time period.

6. **Report the Treatment Effects Across Horizons**: Finally, report τ_h, the estimand of the treatment effect, across different horizons $h = \{1, 2, 3, 4, 5, 6, 7, 8\}$, which represent the relative time periods since the adoption of the policy.

Illustrative Example To complement the estimation procedure above consider the following example. Let there be two economies n_1 and n_2 such that n_1 is treated at time $IT = 2$ and n_2 is treated at time $IT = 4$. Then, the average treatment effect τ for each period is given by,

$$\tau = \begin{bmatrix} 0 \\ \tau_{n1,2} \\ \vdots \\ \tau_{n1,T} \\ 0 \\ \vdots \\ \tau_{n2,4} \\ \tau_{n2,5} \\ \vdots \\ \tau_{n2,T} \end{bmatrix}$$

Therefore, the effect at each horizon (h) is computed according to the following,

$$\tau_h = \frac{1}{\Omega_{1,h}} \sum_{i=1}^{N \in \Omega_{1,h}} \tau_{ih}$$

Where, $\Omega_{1,h}$ is all the observations such that inflation targeting is implemented in period $h = t - IT^I$ after the introduction of IT and $h = \{0, 1, 2, 3, \ldots\}$. Finally, this implies that $\tau_1 = \frac{1}{2}(\tau_{n1,3} + \tau_{n2,5})$. Since the computation of the treatment effect relies on the imputation method, there is no requirement for the normalization of $t = -1$. The treatment effects are estimated based on the differences between treated and not-yet-treated units, with weights assigned dynamically, but without forcing the pre-treatment period $t = -1$ to serve as the reference point.

The theoretical framework provides clear implications for τ_h. τ_h is the empirical counterpart for ω_s. Following the announcement of the policy, $\tau_{h=0}$ is expected to be negative. Furthermore, the treatment effect should remain negative until inflation reaches its steady-state level after the policy announcement. Therefore, under the null hypothesis, which posits that inflation expectations should adjust downward after the introduction of IT, $\tau_h < 0$, where h represents the horizons following the policy announcement. The point at which $\tau_h = 0$ is expected to coincide with the policy's implementation, as all adjustments in observed inflation and inflation expectations should occur at the time of the announcement.

This hypothesis rests on some strong assumptions. First, for convergence to the Rational Expectations Equilibrium (REE), it assumes that $\delta_i = 0$. Second, κ is assumed to be constant across countries and over time. This simplifies the model by disregarding the nuances of how policy introduction may influence the speed of learning among agents in different economies, allowing for the identification of the treatment effect. If κ were allowed to vary across time or countries, it would be unclear whether the observed changes stem from shifts in the mean of agents' priors or from changes in the variance.

4.1.1 A note on Identification

After defining the procedure and formal regression used to estimate the treatment effect, it is important to address the identification strategy. Specifically, this section examines whether key assumptions such as *no anticipation* hold prior to the introduction of IT.

Anticipation Anticipation is a central threat to identification in this study. To mitigate this issue, I use the announcement date as the key reference point. The announcement (or anticipation) date is determined from the minutes of monetary policy committee meetings. Specifically, the date is defined as the first explicit discussion of a shift toward either a Taylor-type rule or Inflation Targeting. In cases where prior studies were conducted ahead of the shift to IT, the dates of those studies are used as proxies for anticipation. Addressing the anticipation effect is particularly critical given the nature of the underlying data, which is based on professional forecasters—agents who are well-informed and likely to adjust their expectations based on such discussions. By anchoring the analysis on the date of the first discussion of a policy change, this approach captures the anticipation effect more accurately.

Unobserved Heterogeneity In estimating the constant gain learning model, I assume that unit-level fixed effects ($\delta_i = 0$) are absent. This is critical, as the presence of fixed effects would cause expectations to revert to a mean level, potentially diverging from the rational expectations equilibrium (REE). By setting $\delta_i = 0$, the model ensures that expectations converge to the REE, aligning with the theoretical structure of the model.

Reverse causality is another potential concern, particularly in treatment effect studies. However, in this context, the adoption of IT was largely a response to high inflation or volatility, with the goal of anchoring inflation expectations. Prior to IT adoption, most countries did not systematically track inflation expectations, nor were they integral to monetary policy decisions. This makes it unlikely that expectations influenced the decision to adopt IT, thereby mitigating concerns about reverse causality. Additionally, to address the lack of a natural control group, the study uses a "not-yet-treated" group as a control. For instance, a country treated in 1999Q1 is compared with a country treated in 2010Q3, ensuring credible pre-trend comparisons and supporting the identification strategy.

From a broader macroeconomic perspective, the introduction of Inflation Targeting often coincided with other policy changes, such as fiscal consolidation efforts and adjustments to exchange rate policies. These additional reforms complicate the identification strategy, as the interaction between fiscal policy, exchange rates, and inflation expectations is not entirely clear. Unfortunately, due to data limitations, this study is unable to account for these simultaneous policy changes. As a result, the potential confounding effects of these factors are left for future research.

Despite these challenges, the analysis attempts to control for the main drivers of inflation expectations through robust identification methods. However, the limitations imposed by quarterly survey data and the focus on professional forecasters should be noted. These constraints, while minimized where possible, suggest avenues for further exploration into the dynamic interactions between various macroeconomic policies and expectations.

Before I turn to the results from the empirical analysis, here are a few crucial details about the estimation procedure followed in this section. First, I restrict the sample to only non-hyperinflationary economies due to data limitations. Second, I restrict the sample to countries where I have at least 20 observations after the announcement of the policy to allow for proper standard error computation. Third, when performing the estimation of (35), I find that the coefficient on the forecast error - the kalman gain is, $\hat{\kappa} = 0.327$. This implies that survey respondents use approximately, three quarters (or nine-months) of information when forming their beliefs[5]. Fourth, the weights for the final computation of the average treatment effect are, $w_0 = w_1 = w_2 = w_3 = w_4 = 0.045, w_5 = w_6 = w_7 = w_8 = 0.043$. Finally, I have $N = 32$ and $T = 115$.

4.2 Announcement when agents are learning

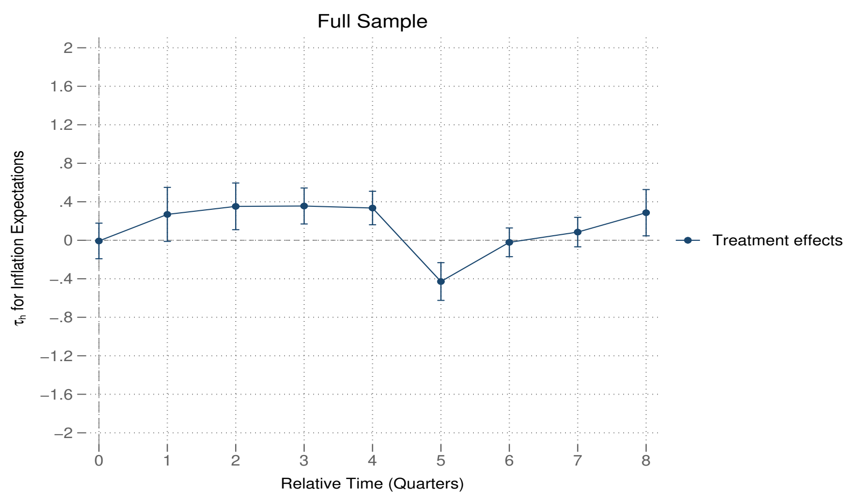
Figure 7 through 8 present the first set of findings. In each figure, the coefficient on τ_1, where $h = 1$, reflects the treatment effect one quarter after the policy announcement. I estimate the treatment effects up to eight quarters ahead, which corresponds to two years after the policy announcement. Typically, inflation targeting is expected to anchor

[5]The time used is computed as $\frac{1}{\kappa}$ as in Molnár and Santoro (2014).

expectations between two and five years. As a robustness check, I extend the horizon to 20 quarters, and the results remain robust.

Fact 1: *Inflation expectations do not respond to the announcement of the policy.*

Figure 7: Inflation Expectations around announcement



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

Figure 7 shows the response of inflation expectations to the policy announcement. The results indicate that inflation expectations do not respond immediately to the announcement. Six months after the announcement, inflation expectations increase marginally by 0.4%, but this effect dissipates within two to three quarters. Overall, there is no significant change in inflation expectations up to two years after the policy announcement.

I now turn to the remaining regressions examined in this paper. First, I am to disentangle the relationship between inflation and inflation expectations through the estimation below:

$$\pi_{it} = \beta\pi_{it-1} + \delta\pi^e_{it-1} + D_{it}\tau_{it} + \epsilon_{it} \tag{36}$$

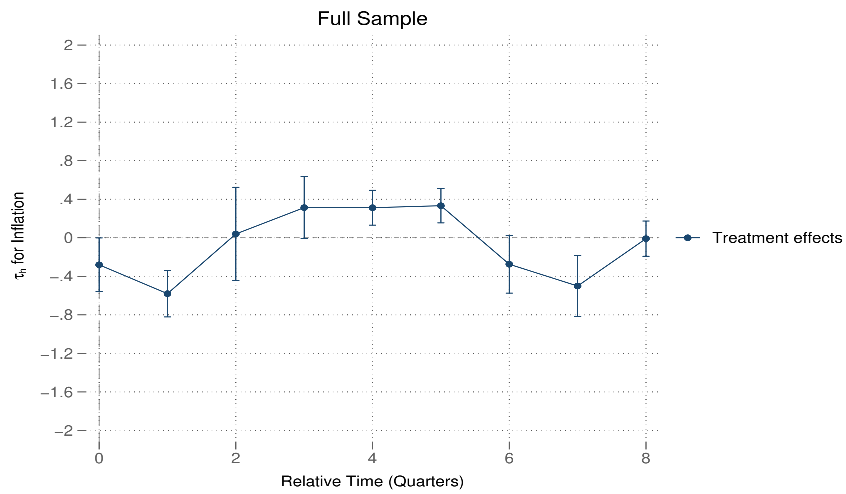
Equation (36) regresses inflation in period t for country i on past inflation and past inflation expectations[6]. Since, we know that inflation is a highly persistent process, including the lag of the variable was critical. I add a control for inflation expectations to account for the relationship in the NKPC before the policy was adopted. As before, τ_{it} should capture any effect of the announcement of the policy. A potential concern with this regression is whether δ might absorb the treatment effect. However, since I have already demonstrated that expectations do not change upon policy announcement, it is reasonable to assume that τ_{it} will adequately capture the treatment effects on inflation. Nonetheless, to address this concern, I run alternative specifications without accounting for expectations and the results remain unchanged. For the results below, $\hat{\beta} = 1.02$ and $\hat{\delta} = -0.079$.

In this analysis, the effect of the policy on inflation, denoted as τ_h, will be computed as the average treatment effect to account for the staggered adoption of the policy across countries in my dataset. Consistent with the hypothesis for expectations, I anticipate that τ_h will show an initial decline in inflation following the policy announcement. This effect is expected to gradually dissipate as the implementation period approaches, reflecting the incremental adjustment process observed in the model.

Fact 2: *Inflation declines following the announcement of the policy*

[6] It is important to acknowledge that Borusyak et al. (2024) do not have results about the properties about the asymptotics of the estimator when there is dynamic panel data. That is, when there is a lag of the dependent variable present on the left hand side.

Figure 8: Inflation after the announcement



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

Figure 8 illustrates the response of realized inflation to the policy announcement. In contrast to expectations, realized inflation declines significantly following the announcement. This decline persists for two quarters before fading. While the decrease in inflation is relatively small, it is statistically significant. Moreover, a further decline in inflation occurs approximately one year after the announcement. This suggests that policymakers may have waited for favorable exogenous shocks to lower inflation prior to the announcement, possibly to bolster the credibility of the new policy[7]. Additionally, central banks may begin implementing preparatory measures for the policy, contributing to the observed decline in inflation several quarters after the announcement.

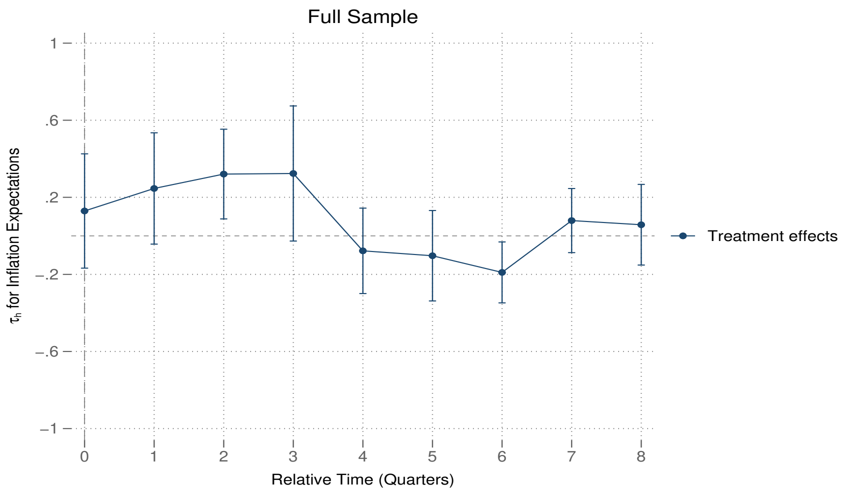
4.3 Implementation when agents are learning

While the theoretical model in Section 2 suggests that agents adjust their expectations upon the policy announcement, it is plausible that a lack of credibility prevents the announcement from having a significant effect in the data. However, once the central bank implements IT—where inflation is expected to be anchored to the target in every period—agents may begin to respond to the policy's introduction. Consequently, I now

[7]Some evidence can be found here Bomfim and Rudebusch (2000)

use the implementation date as the event period to assess whether inflation expectations and observed inflation adjust. The regression specifications for inflation expectations and inflation remain consistent with those in equations (35) and (36).

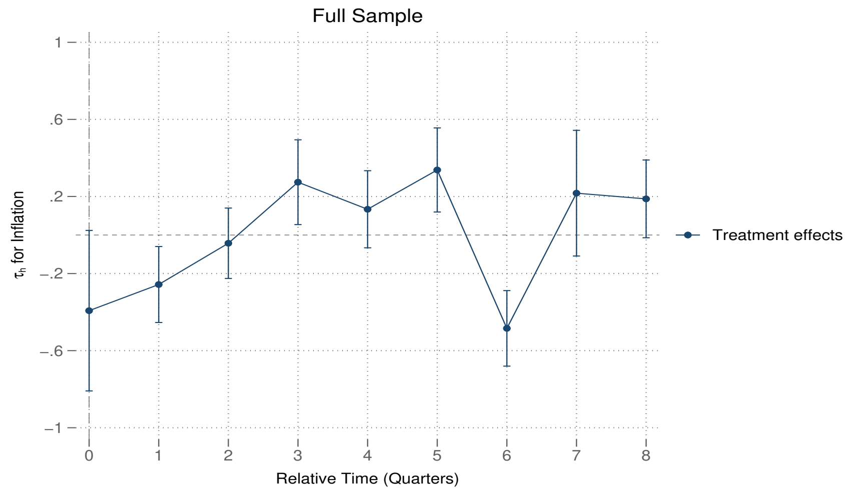
Figure 9: Inflation expectations after the implementation



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

Figures 9 and 10 depict the treatment effect on inflation expectations and inflation, respectively, using the implementation date as the event period. The blue dots represent the estimands τ_h, and the vertical lines indicate the confidence intervals around each coefficient. The results based on the implementation date mirror those observed when the policy announcement was used as the event. Specifically, I find that while inflation expectations do not adjust to the policy's implementation, observed inflation declines following the adoption of IT.

Figure 10: Inflation after the implementation



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

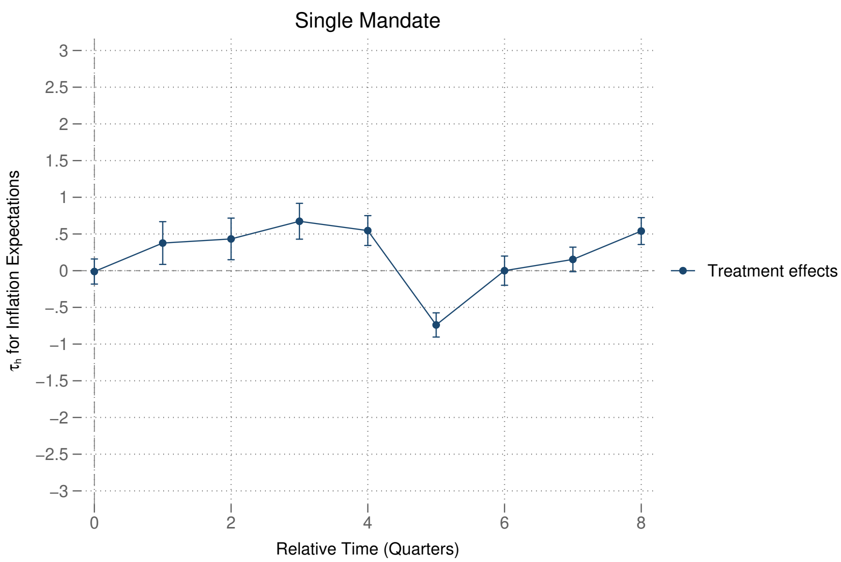
Taken together, these findings reveal a key conclusion of this paper: inflation expectations do not respond to the policy announcement. Instead, it is realized inflation that declines following the announcement. This suggests that *observed inflation leads inflation expectations*, rather than the reverse. This result contrasts with the prediction from the New Keynesian model discussed in Section 2, where expectations were expected to adjust immediately to the policy change. The empirical evidence implies that agents require tangible reductions in observed inflation before they adjust their inflation expectations, indicating that expectations are more backward-looking than the model assumes.

One common point of debate in the literature is the distinction between full inflation targeters and soft inflation targeters. The former refers to economies with a single mandate, such as the ECB, while the latter includes economies with dual mandates, like the US. As shown in Figures 11 and 12, economies with single mandates exhibit no significant changes in inflation expectations, consistent with the aggregate result. In these figures, the dots represent the point estimates of the treatment effects, while the vertical lines indicate the corresponding confidence intervals.

Interestingly, economies with single mandates experience a larger decline in observed inflation (approximately 1%) compared to the baseline result. This is unsurprising, as central banks with a single mandate can focus exclusively on controlling inflation without being hindered by competing objectives. Consequently, these economies see a stronger adjustment in both inflation and forecast errors. This finding supports the idea that delegating a single policy objective to central banks, as discussed in Duggal and Rojas (2023), may enhance the effectiveness of monetary policy.

Fact 3: *Inflation expectations for countries with single mandates do not adjust significantly after the announcement.*

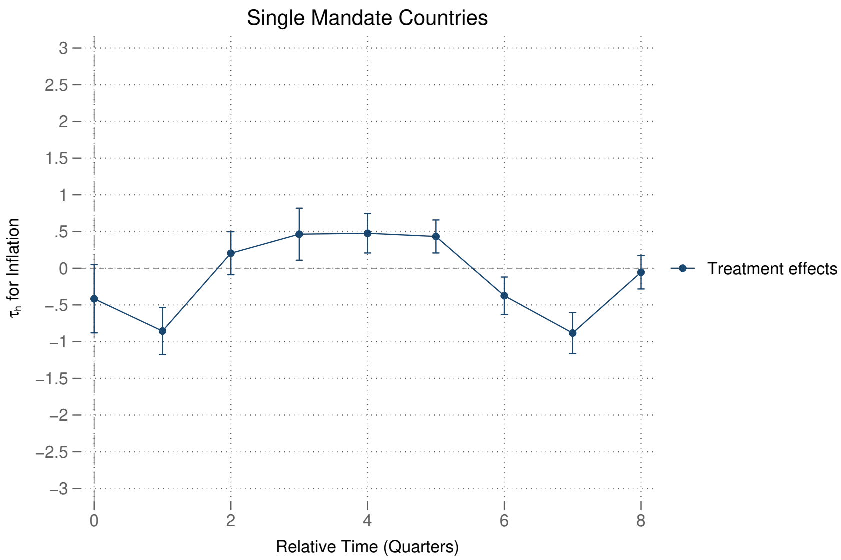
Figure 11: Inflation Expectations around the announcement



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

Fact 3a: *Inflation declines for economies with single mandates*

Figure 12: Inflation around the announcement



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

The findings raise an important question: why do inflation expectations fail to adjust following the policy announcement? One potential explanation is explored in the work of Gibbs and Kulish (2017). In their model, an economy undergoing disinflation experiences imperfectly anchored inflation expectations. Gibbs and Kulish (2017) introduce a framework that incorporates adaptive learning to evaluate the costs of disinflationary policies. They attribute these costs to the imperfect credibility of the central bank. In their model, agents gradually adjust their expectations based on observed inflation outcomes rather than fully internalizing the announced policy shift. This learning process leads to higher costs during disinflation, as agents require tangible evidence of declining inflation to revise their expectations. The imperfect credibility of the central bank exacerbates this learning dynamic, delaying the anchoring of expectations and prolonging the adjustment period.

4.4 Unit and Time Varying Gain

In the preceding section, I made a simplifying assumption that the Kalman gain remains constant over time and is uniform across countries. However, recent literature challenges this assumption. For example, Carvalho et al. (2023) and Pfäuti (2023) present evidence that the gain not only varies over time but also responds to fluctuations in the inflation level. To incorporate these complexities into my analysis, I adapt the empirical framework as follows:

$$\pi^e_{it} = \pi^e_{it-1} + \underbrace{(\beta + \gamma\pi_t)}_{\kappa}(\pi_{it-1} - \pi^e_{it-1}) + D_{it}\tau_{it} + \epsilon_{it} \tag{37}$$

Equation 37 allows the gain, κ, to be a dynamic function of the inflation level, π_t, within each country and to vary over time, potentially capturing shifts in expectations driven by inflation. This modification aims to better capture the observed responsiveness of expectations to inflation fluctuations across different countries and over time. By modeling the Kalman gain as a function of inflation, this approach aligns with the findings of Carvalho et al. (2023) and Pfäuti (2023), who highlight how changing inflation environments can influence agents' learning and adjustment processes. Importantly, allowing the gain to vary with inflation levels enables the model to reflect more realistic, adaptive expectations without directly specifying a gain for each country or time period, which would otherwise hinder the identification of the treatment effect, τ_{it}.[8]

Figure 13 displays the results from regression (37). Upon incorporating the inflation level to the Kalman gain, however, does not yield a different result compared to earlier. Inflation expectations still do not respond to changes in the monetary policy framework or its announcement. This suggests that despite significant heterogeneity in the economies, the announcement of a monetary policy framework does not lead to changes in expectations. The result does not change if we assume that the date of implementation is when agents are more likely to believe the announcement.

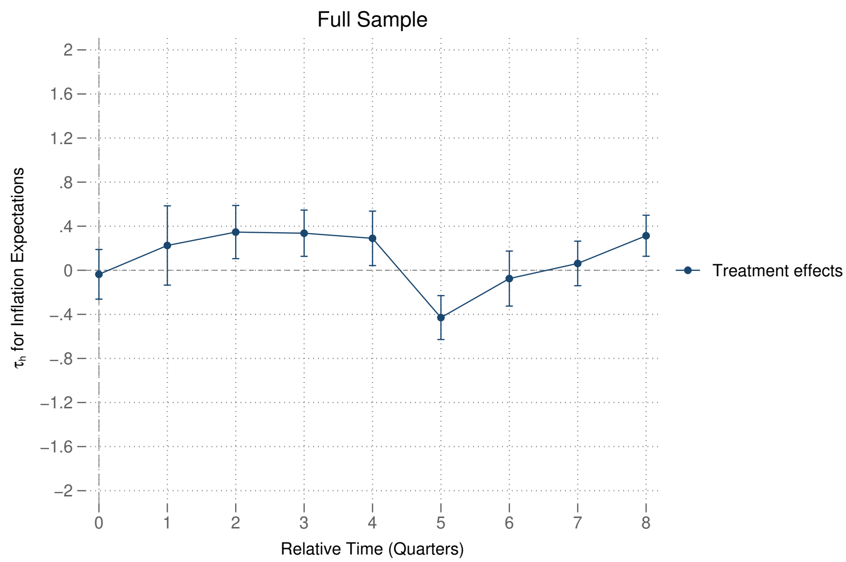
5 Robustness Checks

The paper's main finding is both unexpected and challenging for central banks, underscoring the importance of robustness tests. This section details the robustness exercises conducted to ensure the validity of the results, grouped into three categories. First, alternative definitions of rational expectations are applied to evaluate the impact of policy changes. Second, additional controls and alternative methodologies are introduced

[8] Any additional country-specific heterogeneities are assumed to be captured by the treatment effect.

to verify the robustness of the results. Third, various estimators are used to confirm that the findings are not driven by the specific methods employed in the analysis.

Figure 13: Inflation Expextations around the announcement with heterogeneity



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

5.1 Forecast Revisions and Forecast Errors

Adapted from the Full Information Rational Expectations (FIRE) framework and in line with adaptive learning, the following regression can be specified by rewriting equation 35 as:

$$\underbrace{\pi^e_{it} - \pi^e_{it-1}}_{\text{Forecast Revision}} = \bar{\alpha} + \kappa\underbrace{(y_{it} - \pi^e_{it-1})}_{\text{Forecast Errors}} + \epsilon_{it} \tag{38}$$

This formulation allows for direct measurement of the gain parameter, which reflects the speed at which agents update their expectations based on forecast errors. Following Coibion et al. (2020), Huber-robust regressions are employed to control for outliers in the data. The regression is further adjusted to compute the gain parameter before and after the adoption of inflation targeting (IT) policies:

$$\underbrace{\pi^e_{it} - \pi^e_{it-1}}_{\text{Forecast Revision}} = \bar{\alpha} + \bar{\alpha}\mathbb{1}_{t\geq t^*} + \kappa\underbrace{(y_{it} - \pi^e_{it-1})}_{\text{Forecast Errors}} + \underbrace{\kappa_{IT}(y_{it} - \pi^e_{it-1})\mathbb{1}_{t\geq t_{IT}}}_{\text{Forecast Errors after IT}} + \epsilon_{it} \tag{39}$$

Here, the break point is defined as the policy announcement and implementation date for each country. The key finding from this analysis is that for most countries, changes in the gain parameter after the announcement or implementation of inflation targeting are statistically insignificant. However, in a few cases, countries exhibit a significant increase in the estimated gain parameter post-IT. This supports the overall conclusion that there is no significant change in expectations following the implementation or announcement of inflation targeting policies. Table 3 presents results for Colombia and the United States, showing that the gain parameter (κ) remains unchanged after the policy introduction, and this holds true even when using the anticipation dates of IT.

Table 3: Forecast Revisions on Forecast Errors

(a) Colombia

VARIABLES	1	2
Forecast Errors	0.213***	0.292***
	(0.0584)	(0.0183)
Cons$*\mathbb{1}_{t\geq t^*}$		0.728***
		(0.0724)
FE$*\mathbb{1}_{t\geq t^*}$		-0.0759
		(0.0533)
Constant	0.0217	0.616***
	(0.0855)	(0.0775)
Observations	115	115

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(b) United States

VARIABLES	1	2
Forecast Errors	0.0722**	0.0706*
	(0.0311)	(0.0366)
Cons$*\mathbb{1}_{t\geq t^*}$		-0.00952
		(0.0463)
FE$*\mathbb{1}_{t\geq t^*}$		9.36e-05
		(0.0704)
Constant	-0.0153	0.224***
	(0.0220)	(0.0274)
Observations	115	115

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.1.1 Volatility of Expectations

Beyond anchoring expectations around the inflation target, one of the key goals of inflation targeting is to reduce the volatility of inflation expectations. To measure changes in the volatility of expectations, this paper follows the approach of Gürkaynak et al. (2010a), who suggest regressing changes in inflation compensation on the surprise component of macroeconomic data and policy announcements. Formally, the regression is specified as:

$$\Delta\pi_t^e = \bar{\alpha} + \gamma_1(y_t - \pi_{t-1}^e) + \gamma_{IT}(y_{it} - \pi_{it-1}^e)\mathbb{1}_{t \geq t_{IT}} + \epsilon_t \tag{40}$$

Here, γ_1 and γ_2 capture the impact of inflation surprises on the volatility of expectations. Notably, if equation (40) is rewritten, it closely resembles equation (38), reinforcing the previous result that there is no significant change in the volatility of expectations after the implementation or adoption of inflation targeting policies.

5.2 FIRE Framework

In addition to the regression in the previous section above, one can check the coefficients of the *Full Information Rational Expectations (FIRE)* framework. Following, Coibion and Gorodnichenko (2015), Bordalo et al. (2020) the following test is run.

$$\underbrace{y_{it} - \pi_{it-1}^e}_{\text{Forecast Errors}} = \bar{\alpha} + \bar{\alpha}\mathbb{1}_{t \geq t^*} + \gamma_\kappa \underbrace{(\pi_{it}^e - \pi_{it-1}^e)}_{\text{Forecast Revision}} + \underbrace{\gamma_{\kappa_{IT}}(\pi_{it}^e - \pi_{it-1}^e)\mathbb{1}_{t \geq t_{IT}}}_{\text{Forecast Revision after IT}} + \epsilon_{it} \tag{41}$$

The regression above is based on the idea that forecast errors should not be predictable by the forecast revisions. One can run the test for each country to check if there have been changes in the predictability of forecast errors. This would capture any changes that might have occurred post the announcement and adoption of IT and therefore an impact of the policy.

Similar to the findings in section (5.1) there is no pattern in the way there are changes in the predictability of forecast errors. However, for some countries such as Colombia and the US, forecast errors have become more predictable after IT compared to before the announcement. The tables below (4) present the results for Colombia and the US. The results do not alter significantly if using the date of intervention as the announcement or the implementation of the policy.

Table 4: Forecast Errors on Forecast Revisions

(a) Colombia

VARIABLES	1	2
Forecast Errors	0.0699	1.545***
	(0.185)	(0.235)
Cons$*\mathbb{1}_{t\geq t^*}$		-1.559***
		(0.279)
FE$*\mathbb{1}_{t\geq t^*}$		-1.459***
		(0.307)
Constant	-0.283**	1.225***
	(0.128)	(0.171)
Observations	115	115

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(b) United States

VARIABLES	1	2
Forecast Errors	0.742***	0.563
	(0.227)	(0.410)
Cons$*\mathbb{1}_{t\geq t^*}$		-0.155
		(0.171)
FE$*\mathbb{1}_{t\geq t^*}$		0.226
		(0.464)
Constant	-0.0525	-0.344**
	(0.0719)	(0.155)
Observations	115	115

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

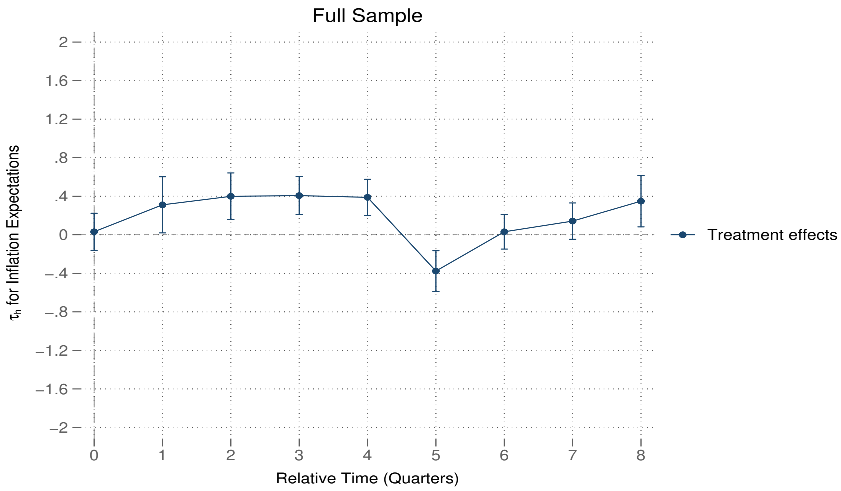
5.3 Past Inflation

One possible confounding factor that could explain the lack of effect in the baseline results is the level of previous inflation. If inflation was consistently high before the policy announcement, inflation expectations might be anchored and thus less responsive to the announcement. To address this concern, I run the following specification to ensure that the treatment effect is not being muted due to the omission of previous inflation as a control.

$$\pi^e_{it} = \pi^e_{it-1} + \kappa(\pi_{it-1} - \pi^e_{it-1}) + \gamma\pi_{it-1} + \epsilon_{it} \tag{42}$$

The variables in this specification are the same as before. Figure 14 presents the results for the new specification. As before, the blue dots are the point estimates and the vertical lines are the confidence bands surrounding each estimate. After controlling for the level of previous inflation, there is no change in the baseline result of the response of inflation expectations. Therefore, the initial result remains robust.

Figure 14: Inflation expectations after the announcement



5.4 New versus Old Targeters

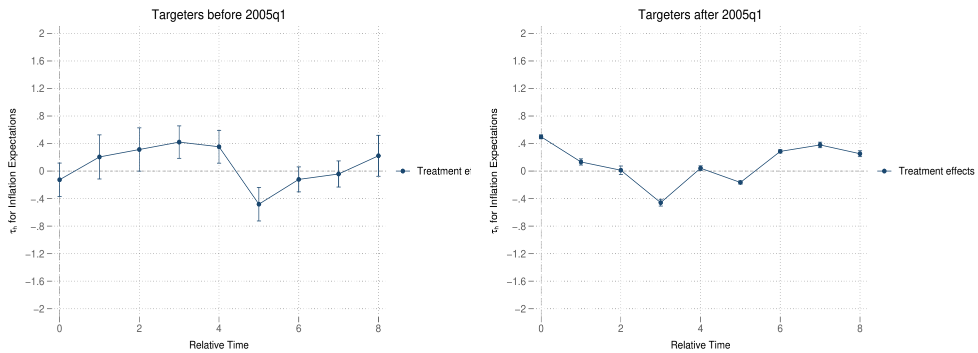
One of the features that is exploited in the event study is the different start dates of the policy. The different dates allow for the construction of the hypothetical which considers how the economies would respond if the policy was not implemented. However, there is one big factor that plays a role in these days. Some of the countries adopted IT after the financial crisis while others in the late 90s and early 2000s. The nature of global shocks was different at both these times. In addition, countries which adopted targeting later had evidence from previous adopters on how implementation. Therefore, this paper now tests whether new adopters of the policy had an advantage and if they were able to capitalise on it.

The data set is now split as per countries which adopted targeting before and after 2005Q1 (as per the announcement date). 2005Q1 is roughly the middle date of the sample period and allows the econometric methodology to still hold with a variety of adoption dates.

Figure 15 and 16 presents the findings upon dividing the sample between those who adopted targeting prior to and post 2005q1. An additional variable that controls for the Great Financial Crisis (GFC) is used to capture any effects of the time effects of the crisis. The results remain the same as those found previously. There is no significant change in inflation expectations on announcement or implementation of the policy. One interesting feature of this study however is the increased volatility of expectations for the countries which adopt IT after 2005q1.

Figure 15: Old and New Targeters: Inflation Expectations

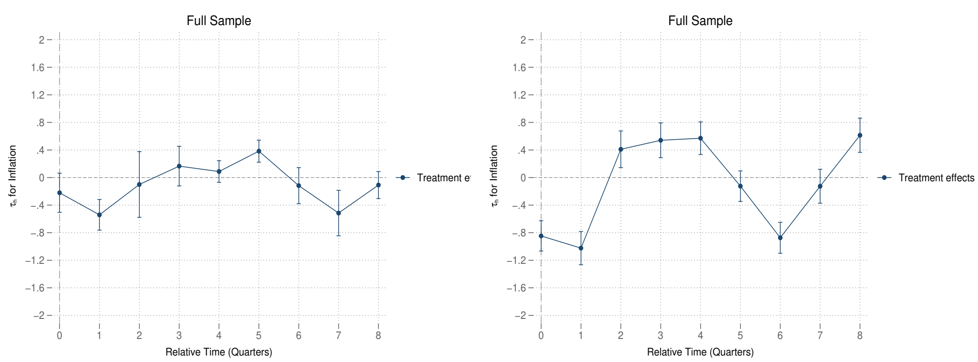
(a) Old Targeters (b) New Targeters



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

Figure 16: Old and New Targeters: Inflation

(a) Old Targeters (b) New Targeters



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

5.5 Central Bank Transparency

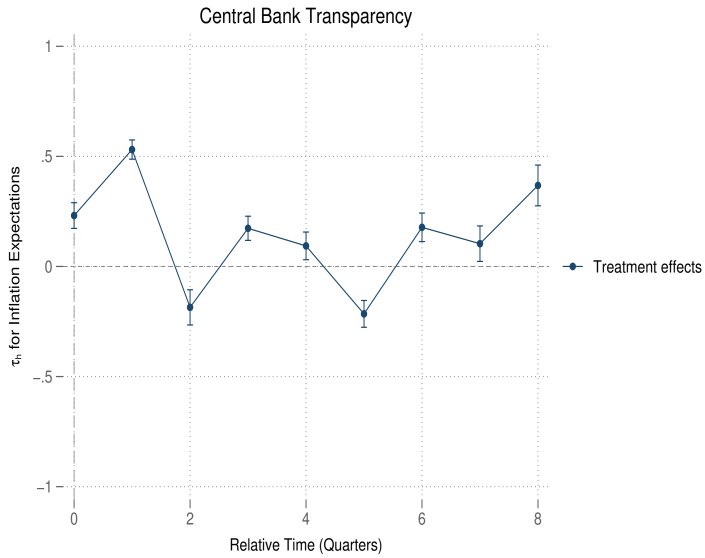
Credibility plays a crucial role in shaping inflation expectations. A clear example of this is the experience of many Latin American economies prior to the establishment of independent central banks. When monetary policy remained under government control, these countries often faced credibility crises that led to hyperinflationary cycles. However, after the central banks gained independence, many of these economies experienced a sustained decline in inflation rates. As shown by Duggal and Rojas (2023), credible policy announcements were key to reducing inflation expectations, further demonstrating the importance of central bank credibility.

While there are no direct measures available to quantify the credibility of central banks, an index of transparency and independence developed by Dincer and Eichengreen (2013) serves as a useful proxy. This paper utilizes this index to approximate central bank credibility. The reason is that greater transparency and independence provide central banks with more effective control over monetary policy and the ability to achieve their objectives, thereby making the index a good proxy for credibility. To analyze the impact of central bank transparency on inflation expectations, the following regression is estimated:

$$\pi^e_{it} = \bar{\alpha} + \pi^e_{it-1} + \kappa(y_{it} - \pi^e_{it-1}) + \gamma_3 TR + \epsilon_{it} \tag{43}$$

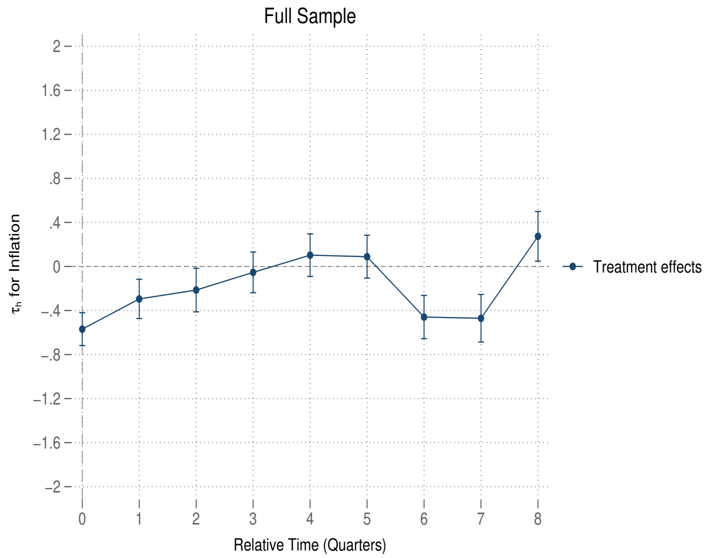
In this equation, the variables are as previously defined, with the addition of TR, which captures the level of central bank transparency. The dataset for central bank transparency spans the years 1998-2019, though it excludes countries that are part of the European Monetary Union (EMU), as well as Paraguay and Uruguay. A combined index is available for the EMU, but since different countries implemented inflation targeting at different times, the EMU data is excluded from this analysis. Due to the limited availability of transparency data, the analysis focuses on a smaller subset of countries: Hungary, India, Japan, Korea, Mexico, Norway, the Philippines, South Africa, Switzerland, Thailand, and the United States. An important caveat is that the data used in this analysis is not weighted by country GDP or population, as such weighted data is not readily available. Incorporating weighted data is left for future research.

Figure 17: Inflation Expectations After controlling for Transparency



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

Figure 18: Inflation After controlling for Transparency



Note: the blue dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

Figure 17 presents the results of the analysis after controlling for central bank transparency. Consistent with the baseline results, there is no significant change in inflation expectations following the policy announcement, even after accounting for transparency. While there is increased volatility in the coefficients compared to the baseline, the core implication remains unchanged: the changes in expectations are centered around zero. This suggests that the primary findings hold when the sample is restricted to countries with available transparency data.

However, it is important to exercise caution when interpreting these results. The smaller sample size limits the ability to draw definitive conclusions about the effect of central bank transparency on inflation expectations.

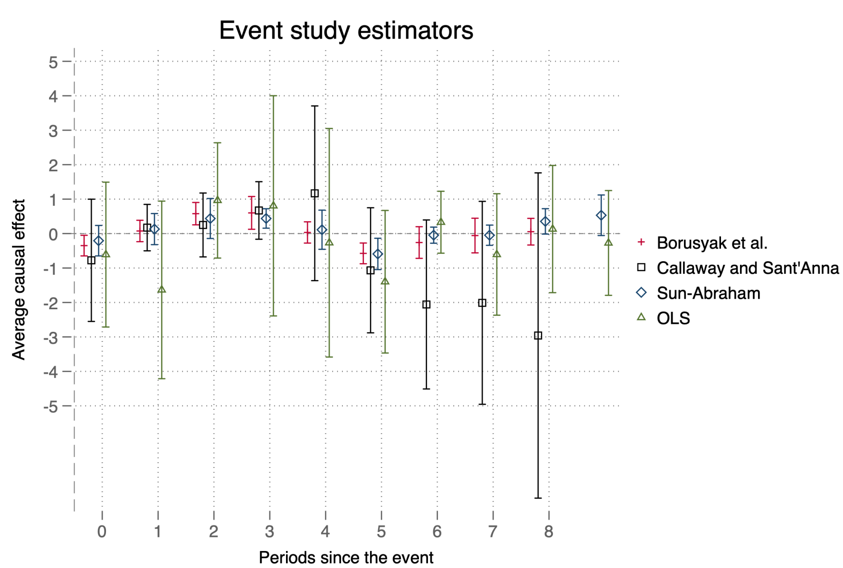
5.6 Other Estimators

In recent years, there has been a surge in the literature addressing biases in event studies, particularly with respect to Two-Way Fixed Effects (TWFE) models. Two prominent studies in this area are Sun and Abraham (2021) (SA) and Callaway and Sant'Anna (2021) (CS). A key distinction between these approaches and the method proposed by Borusyak et al. (2024) lies in how they construct the control group for analysis.

Both SA and CS are group-based estimators, meaning they group the data by the year in which the policy is implemented. While this method can be effective for larger datasets, it poses limitations for smaller panels, such as the one used in this study. Additionally, both estimators are designed to balance data in event time, which often results in the loss of valuable information. This approach may lead to inflated standard errors and potentially inconsistent estimates, particularly when the dataset is not large enough to support such grouping effectively.

In contrast, the imputation strategy proposed by Borusyak et al. (2024) offers a more robust solution for smaller datasets. This method constructs the control group by regressing the treatment group on data from all periods prior to policy implementation, thereby retaining more information and mitigating the limitations posed by other estimators. By allowing for the inclusion of all available data, this approach enhances the precision and consistency of the estimates, which is particularly critical in smaller samples.

Figure 19: Treatment Effect of Implementation



Note: the dots represent the point estimates τ_h of the average treatment effect, while the vertical lines depict the confidence intervals for each estimate. The x-axis measures the horizon (h) following the introduction of the policy. The confidence interval is measured at 95%.

Figure 19 presents the treatment effects estimated by four different methods: OLS, the estimators of Sun and Abraham (2021), Callaway and Sant'Anna (2021), and Borusyak et al. (2024). As expected, OLS performs the worst in terms of both estimate precision and standard errors. Although all four estimators show no significant evidence of changes in expectations following policy implementation, the choice of estimator remains crucial. The estimator by Borusyak et al. (2024) provides the most reliable estimates in this context by leveraging the most data, making it a more appropriate choice for this study.

The robustness of the core findings has been confirmed through a variety of checks, including controls for past inflation, volatility, and deviations from inflation targets. These analyses demonstrate that the observed patterns in inflation expectations remain consistent across different specifications, lending credibility to the empirical results.

6 Conclusion

This paper investigates how inflation expectations respond to changes in monetary policy, with a specific focus on the adoption of inflation targeting across various countries. The analysis builds on a New Keynesian model with trend inflation, integrating a theoretical framework that examines structural changes under Full Information Rational Expectations (FIRE). Empirically, the paper leverages survey data from professional forecasters to test the model's predictions against observed expectations dynamics.

The theoretical model suggests that inflation expectations should adjust immediately to a new policy framework, reflecting the credibility and commitment of the central bank. However, the empirical findings challenge this prediction, showing that inflation expectations do not respond as quickly as traditional models would suggest. Instead, realized inflation adjusts more rapidly, indicating that agents may be waiting for concrete evidence of inflationary trends before revising their expectations. This result highlights a pattern where inflation leads expectations, rather than expectations driving inflation, particularly in the initial stages of policy implementation.

While this paper employs learning dynamics to capture the gradual adaptation of expectations, further refinement of these mechanisms could offer a deeper understanding of why inflation adjusts more readily than expectations. Specifically, the slower adjustment of expectations observed empirically might partly reflect other concurrent structural changes, such as fiscal consolidation and shifts in exchange rate regimes, which frequently accompany the adoption of inflation targeting. These factors could independently shape inflation dynamics, adding complexity to the relationship between policy announcements and expectations.

Future research could extend this analysis by refining learning frameworks to account for such complexities, enhancing the model's ability to capture the broader environment in which policy shifts occur. Additionally, expanding the empirical analysis to control for fiscal adjustments and exchange rate changes would provide a clearer understanding of the specific impact of monetary policy on inflation expectations. These extensions would deepen our understanding of how expectations are formed and adjusted, informing more effective strategies for central banks aiming to anchor inflation expectations.

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Appendices

A List of IT Countries

Table A.1: List of IT countries

Name of Country	Start Year	Announcement Year
Argentina	2016Q3	2015Q4
Austria	1999Q1	1998Q2
Belgium	1999Q1	1996Q1
Brazil	1999Q2	1995Q4
Chile	1999Q3	1990Q3
Colombia	1999Q1	1993Q1
Czech Republic	1998Q1	1997Q4
Finland	1995Q1	1993Q1
Germany	1999Q1	1998Q1
Hungary	2001Q3	2001Q2
India	2016Q3	2015Q1
Ireland	1999Q1	1997Q1
Israel	1997Q2	1994Q3
Italy	1999Q1	1998Q1
Japan	2013Q1	2012Q1
Korea	1999Q1	1998Q2
Mexico	2001Q1	1998Q1
Netherlands	1999Q1	1998Q1
Norway	2001Q1	1999Q2
Paraguay	2011Q2	2004Q2
Peru	2002Q1	1994Q1
Philippines	2002Q1	2001Q4
Poland	1999Q1	1998Q1
Russia	2014Q1	2013Q3
South Africa	2000Q1	1999Q2
Spain	1997Q1	1994Q4
Switzerland	2000Q1	1999Q3
Thailand	2000Q2	2000Q1
Turkey	2002Q1	2001Q2
Ukraine	2016Q1	2015Q3
United States	2012Q1	2008Q4
Uruguay	2007Q3	2004Q4

B Inflation Targeting

A country is called an Inflation Targeter (Hammond et al. (2012)) when the following conditions are met.

1. Price stability is recognised as the explicit goal of monetary policy.
2. There is a public announcement of a quantitative target for inflation.
3. Monetary policy is based on a wide set of information, including an inflation forecast.
4. Transparency
5. Accountability mechanisms.

C Country Classification

The following table details three different classifications for each country. First, whether each country is advanced or developing. Second, whether each country has a single or dual mandate. Third, whether the country has experienced an episode of hyperinflation.

The classification of a country as developing or advanced is based on the UN country classification. The distinction between countries who have single mandates and those with dual mandates (or flexible targets) is based on the mandates available on the central bank websites. A country has been classified as one with hyper inflationary episodes if it has ever had inflation greater than 50%, in the sample period.

Note: The final data used for the event study analysis excludes the countries that have had episodes of hyperinflation in the period covered by the data set.

Table C.2: List of IT countries

Name of Country	Development Status	Mandate	Hyper Inflation
Argentina	Developing	No-mandate	Yes
Austria	Advanced	Dual	No
Belgium	Advanced	Dual	No
Brazil	Developing	Single	Yes
Chile	Developing	Single	No
Colombia	Developing	Single	No
Czech Republic	Developing	Single	Yes
Finland	Advanced	Dual	No
Germany	Advanced	Dual	No
Hungary	Advanced	Single	No
India	Developing	Single	No
Ireland	Advanced	Dual	No
Israel	Developing	Single	No
Italy	Advanced	Dual	No
Japan	Advanced	Single	No
Korea	Developing	Single	No
Mexico	Developing	Single	No
Netherlands	Advanced	Dual	No
Norway	Advanced	Single	No
Paraguay	Developing	Single	No
Peru	Developing	Single	Yes
Philippines	Developing	Single	No
Poland	Advanced	Single	Yes
Russia	Developing	Single	Yes
South Africa	Developing	Single	No
Spain	Advanced	Dual	No
Switzerland	Advanced	Dual	No
Thailand	Developing	Single	No
Turkey	Developing	Single	Yes
Ukraine	Developing	Single	Yes
United States	Advanced	Dual	No
Uruguay	Developing	Single	Yes

Source: Central Bank websites, UN classification.

D Barro and Gordon (1983)

Let's assume the following simple model of the central bank with the loss function given by,

$$\mathcal{L}^{CB} = \max_{\pi_t} \frac{1}{2}\Big[(y_t - y^*)^2 + a(\pi_t - \pi_t^*)^2\Big] \tag{44}$$

Where, y_t and π_t are the current output and inflation levels. y^*, π^* are the potential output and inflation target. $\mathcal{L}^{CB}$ represents the loss function of the central bank subject to the following constraint,

$$y_t = b(\pi_t - \pi_t^e) \tag{45}$$

45 is the Phillips Curve, $a, b > 0$ and there is perfect foresight. Given there are rational expectations this would imply that $\pi_t^e = \pi_t$. That is, agents always know the optimal level of inflation from the central bank's loss function. Let us now consider the switch in regimes.

D.1 Pre-Inflation Targeting: No commitment

Let's solve for the optimal inflation when the central bank does not have full commitment which is assumed to be the case before Inflation Targeting. This is not an unreasonable assumption, since many economies faced high inflation prior to the adoption of targeting.

Take first order conditions and solve for optimal inflation with given inflation expectations and $\pi^* = 0$,

$$\pi_t = \frac{b(\pi_t^e + y^*)}{a+b} \tag{46}$$

$$\pi_t^e = \frac{(a+b)\pi_t - by^*}{b} \tag{47}$$

Given the central bank does not have commitment and agents have rational expectations, the inflation will follow (47) which is often referred to as the inflation bias level.

D.2 Post-Inflation Targeting: Full commitment

Let the central bank now announce the new credible policy of inflation targeting. Further, assume that the bank now has full commitment to bring reduce inflation to the target and let $\pi_t^* \geq 0$.

Then, following the same procedure as above we find the following,

$$\pi_t = \pi_t^* = \pi_t^e \tag{48}$$

Therefore, with rational expectations and full commitment by the central bank, inflation expectations will always be equal to the inflation target. Therefore, in accordance with the rational expectations hypothesis (REH) inflation should jump from (47) to (48) once inflation targeting is announced.

E A note on Short-Run Expectations

The primary goal of Inflation Targeting is to anchor medium-long run expectations. Thus, it can be argued that IT should not matter for short run expectations. However, consider the Euler equation based on the Neoclassical Growth Model,

$$u'(c_t) = \beta \mathbb{E}_{\mathfrak{t}} \Big[u'(c_{t+1}) \frac{(1+i_t)}{1+\pi_{t+1}} \Big] \tag{49}$$

Equation (49) explains how consumption today, adjusts to inflation expectations one-period ahead. Thus, adjustment to short run expectations leads to stimulation of consumption which further contributes to a rise in inflation. Moreover, since the objective of Inflation Targeting is respond to deviations in target irrespective of the length of time of deviations. Therefore, the central bank would also want to pay attention to short run expectations. In addition, the long run is derived by taking the sum of (49) to infinity. Therefore, indicating the importance of short run expectations.

The paper now turns to the data to analyse the effect of the introduction of Inflation Targeting on Inflation expectations. Before describing the empirical framework, the next section details the data used in this study along with some of the properties of the forecasts.

F Summary Statistics

Implementation

Table F.3: Inflation Expectations: Full Sample around Implementation

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	19.27***	21.56	.815	28.23	8.27	.524
Austria	2.77***	.870	.980	1.87	.521	.804
Belgium	2.46***	.692	.963	1.88	.729	.777
Brazil	502.19***	679.26	.906	6.07	1.89	.808
Chile	9.81***	4.59	.944	3.45	1.07	.773
Colombia	22.03***	2.91	.915	5.65	3.05	.976
Czech Republic	14.20***	9.17	.834	3.11	2.15	.944
Finland	3.36***	.95	.793	1.718	.768	.843
Germany	2.79***	.984	.971	1.65	.540	.836
Hungary	19.50***	7.86	.960	4.24	2.00	.938
India	7.25***	2.44	.884	4.89	.501	.659
Ireland	2.66***	.436	.796	2.18	1.67	.920
Israel	10.48***	2.81	-.081	2.82	1.74	.903
Italy	4.46***	1.58	.963	1.875	.761	.914
Japan	.497***	.938	.926	.842	.548	.785
Korea	7.10***	1.78	.772	3.1	.979	.887
Mexico	17.77***	10.82	.864	4.68	.872	.893
Netherlands	2.62***	.513	.886	1.96	.762	.881
Norway	2.54***	.642	.802	2.11	.479	.669
Paraguay	11.15***	4.61	.675	4.79	1.07	.802
Peru	4.34***	1.02	.626	2.88	.695	.742
Philippines	8.84***	2.85	.845	4.43	1.50	.853
Poland	30.31***	19.98	.788	3.19	2.187	.957
Russia	125.09***	296.80	.893	7.75	3.35	.906
South Africa	9.82***	2.75	.942	6.13	1.42	.844
Spain	5.075***	1.21	.724	2.27	1.05	.897
Switzerland	2.10***	1.53	.974	.757	0.635	.896
Thailand	6.00***	1.96	.864	2.63	1.33	.794
Turkey	70.98***	18.64	.747	12.02	8.84	.968
Ukraine	13.69***	7.27	.895	11.23	2.01	.564
United States	2.75***	.701	.839	2.025	.304	.741
Uruguay	25.24***	22.81	.983	7.89	.855	.682

Table F.4: Inflation: Full Sample around Implementation

Country Name	$E(\pi_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi_{t,post})$	σ_{post}	ρ_{post}
Argentina	15.30	29.14	.9570	32.19	10.2649	.842
Austria	2.44	1.15	.937	1.87	.8031499	.849
Belgium	2.03	.714	.822	1.92	1.140096	.828
Brazil	715.42	1091.51	.879	6.34	2.663077	.888
Chile	10.03	5.24	.981	3.16	1.945892	.855
Colombia	22.21	3.92	.946	5.14	2.189618	.935
Czech Republic	11.29	4.63	.788	2.51	2.134448	.907
Finland	2.41	1.16	.883	1.39	1.148651	.898
Germany	2.70	1.65	.923	1.43	.6642704	.815
Hungary	19.33	7.75	.957	3.74	2.360664	.921
India	7.68	3.39	.859	4.95	2.304561	.748
Ireland	2.25	.74	.798	1.84	2.486491	.935
Israel	2.81	1.30	.272	.456	1.000285	.209
Italy	4.02	1.53	.969	1.70	1.043962	.927
Japan	.198	1.07	.864	.858	1.019516	.773
Korea	5.71	1.86	.661	2.34	1.242359	.887
Mexico	18.32	10.78	.906	4.27	1.017846	.836
Netherlands	2.43	.602	.853	1.87	.943258	.884
Norway	2.33	.679	.740	2.01	1.059178	.652
Paraguay	10.37	5.43	.864	3.79	1.373676	.734
Peru	91.54	412.78	.879	2.72	1.362741	.852
Philippines	7.76	3.80	.888	3.73	2.016421	.871
Poland	30.84	18.08	.983	2.76	2.55652	.949
Russia	76.71	183.58	.960	6.74	4.509322	.893
South Africa	9.09	3.53	.906	5.32	2.693829	.884
Spain	4.74	.981	.875	2.07	1.46061	.888
Switzerland	2.00	1.91	.973	.490	.8771129	.854
Thailand	4.64	2.42	.873	2.02	1.933139	.823
Turkey	75.04	18.01	.826	11.38	7.448558	.961
Ukraine	293.86	1130.55	.801	10.28	3.593149	.270
United States	2.59	1.08	.747	1.59	.7077859	.797
Uruguay	25.45	25.76	.992	7.95	1.077938	.791

Table F.5: Forecast Errors: Full Sample around Implementation

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	-3.96**	18.68295	.670***	3.96	8.650262	.707**
Austria	-0.327***	.4679931	.565***	0.001	.6910679	.730***
Belgium	-0.432***	.4195077	.455**	0.041	.9064904	.683***
Brazil	213.23***	499.1188	.622***	0.268	1.722025	.662***
Chile	0.218	1.665489	.403**	-0.285*	1.516027	.741***
Colombia	0.420	2.01485	.476**	-0.504**	1.734053	.855***
Czech Republic	-0.942***	3.760238	.54**	-0.603***	1.589391	.725***
Finland	-0.089	.796839	.598**	-0.320***	.80405	.730***
Germany	-0.170	.8298142	.748***	-0.214***	.51593	.551***
Hungary	0.429	2.878666	.521***	-0.490***	1.29543	.653***
India	-0.417***	2.850399	.738***	0.060	2.654569	.765***
Ireland	-7.938***	.6385225	.662***	-0.340**	1.475234	.823***
Israel	-.0437***	3.297099	.078	-2.36***	1.854971	.590***
Italy	-0.299***	.5861911	.732***	-0.169**	.6230933	.738***
Japan	-1.384***	.6225561	.549***	-0.751***	.7110261	.683***
Korea	0.545	1.839256	-0.453**		1.040202	.8157***
Mexico	-0.188**	3.251321	.392**	-0.085	.7393395	.561 ***
Netherlands	-0.213*	.492692	.673***	-0.095	.5500805	.532***
Norway	-1.18**	.7191434	.630***	-0.998***	1.042371	.517***
Paraguay	-1.751***	3.662622	0.422***	-0.162	1.138949	.426**
Peru	-1.08**	1.207112	0.618**	-0.694***	1.056194	.776***
Philippines	0.530	2.473918	.521***	-0.162**	1.628617	.741***
Poland	-23.43***	9.745684	.236	-694***	1.293753	.686***
Russia	-0.731**	81.00855	.703***	-0.428**	2.575003	.620***
South Africa	-0.327	1.994642	.624***	-1.01*	2.056672	.785***
Spain	-0.106	.7509802	.335	-0.805***	1.023761	.682***
Switzerland	-1.35***	.5722116	.764***	-0.209**	.5019372	.637***
Thailand	4.05**	2.42579	.816***	-0.615***	1.572284	.651***
Turkey	-0.007	12.03262	-.019	-0.640	3.690881	.597***
Ukraine	13.69403***	8.550081	.775***	-0.950	4.020822	.781***
United States	-0.158	.968073	.641***	-0.431***	.6205168	.609***
Uruguay	0.2156	5.417912	.620***	0.063	.9759901	.535***

Table F.6: Inflation Expectations: 5 years around Implementation

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	28.58***	4.80	.841***	32.14***	9.96	.665**
Austria	2.23***	.649	.965***	1.69***	.475	.772***
Belgium	2.06***	.446	.940***	1.80***	.366	.725***
Brazil	302.38**	632.32	.952***	7.71***	1.94	.511**
Chile	7.43***	2.16	.946***	3.41***	.791	.792***
Colombia	20.16***	1.04	.370***	9.24***	3.42	.963***
Czech Republic	11.18***	2.89***	.737	6.3***	2.94	.931***
Finland	1.80***	.552***	.592	1.79***	.673	.832***
Germany	2.13***	.550	.914***	1.57***	.448	.825***
Hungary	18.50***	6.40	.937***	6.704***	1.82	.912***
India	7.52***	.644	.537**	5.08***	.522	.683***
Ireland	2.49***	.359	.725***	3.60***	1.18	.847***
Israel	10.15***	2.14	-.069	4.833***	2.55	.879***
Italy	3.6***	1.31	.939***	2.366***	.376	.831***
Japan	.125	.724	.760***	.845***	.594	.787***
Korea	5.55***	1.87	.794***	3.53***	.353	.472**
Mexico	18.00***	6.74	.930***	4.941***	1.16	.966***
Netherlands	2.34***	.160	.398*	2.66***	.825	.778***
Norway	2.4***	.410	.544**	2.02***	.641	.800***
Paraguay	8.26***	2.02	.585**	5.27***	1.15	0.674***
Peru	4.34***	1.02	.626**	2.57***	.521	.630***
Philippines	7.28***	1.62	.349	5.32***	1.32	.858***
Poland	24.71***	7.12	.868***	6.60***	3.38	.969***
Russia	8.07***	.899	.714***	7.77***	3.68	.912***
South Africa	8.16***	1.45	.806***	6.26***	1.599	.893***
Spain	3.42***	1.04	.967***	2.91***	.505	.856***
Switzerland	1.07***	.539	.873***	1.12***	.353	.809***
Thailand	6.49***	2.25	.835***	2.53***	.763	.768***
Turkey	64.95***	18.81	.857***	17.25***	13.26	.977***
Ukraine	13.62***	9.83	.918***	11.23***	2.01	.564**
United States	2.39***	.807	.657***	1.97***	.323	.723***
Uruguay	11.95***	7.69	.840***	7.42***	.752	.378*

Table F.7: Inflation: 5 years around Implementation

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	14.22***	5.27	.836***	37.72***	12.30	.916***
Austria	1.72***	.801	.870***	1.90***	.765	.892***
Belgium	1.63***	.571	.686***	1.97***	.649	.694***
Brazil	462.15*	1165.37	.878***	8.30***	3.33	.823***
Chile	7.19***	2.19	.943***	2.78***	1.15	.819***
Colombia	19.96***	2.07	.824***	7.50***	1.45	.840***
Czech Republic	11.53***	4.95	.790***	4.99***	3.77	.900***
Finland	1.04***	.581	.679***	1.56***	1.07	.906***
Germany	1.60***	.678	.869***	1.41***	.495	.705***
Hungary	18.15***	7.08	.963***	6.22***	2.47	.933***
India	9.07***	2.07	.771***	5.17***	1.96	.718***
Ireland	2.09***	.515	.574***	3.76***	1.56	.876***
Israel	2.60***	.934	.045	.980***	1.35	.063
Italy	3.31***	1.44	.953***	2.41***	.382	.876***
Japan	-.28	1.01	.781***	.913***	1.09	.776***
Korea	3.94***	2.44	.771***	3.08***	.785	.684***
Mexico	17.58***	7.36	.964***	4.57***	.882	.863***
Netherlands	2.10***	.367	.774***	2.53***	.995	.926***
Norway	2.43***	.632	.804***	1.74***	1.15	.503**
Paraguay	7.44***	3.28	.775***	4.64***	2.12	.758***
Peru	4.46***	2.76	.959***	2.16***	1.24	.753***
Philippines	5.90***	2.19	.851***	4.22***	1.80	.894***
Poland	25.24***	8.51	.982***	5.62***	3.97	.957***
Russia	7.43***	2.59	.672***	6.04***	4.34	.954***
South Africa	7.00***	2.34	.762***	4.59***	4.12	.872***
Spain	3.19***	1.29	.951***	3.13***	.582	.512**
Switzerland	.791***	.646	.824***	.967***	.446	.639***
Thailand	4.91***	3.12	.874***	2.36***	1.56	.903***
Turkey	68.81***	16.84	.890***	14.80***	11.15	.982***
Ukraine	14.93***	19.48	.916***	10.28***	3.59	.270
United States	2.25***	1.78	.707***	1.42***	.708	.768***
Uruguay	10.94***	7.56	.836***	7.894	7.72***	.635***

Table F.8: Forecast Errors: 5 years around Implementation

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	-14.35***	4.12	.466**	5.58**	9.34	.616**
Austria	-.507***	.429	.383*	.208	.651	.782***
Belgium	-.426***	.445	.418*	.172	.621	.538**
Brazil	159.77	598.42	.611**	.592	2.95	.651***
Chile	-.236	1.14	.609**	-.626**	1.00	.572**
Colombia	-.194	2.00	.459**	-1.73***	2.33	.846***
Czech Republic	.351	4.04	.546**	-1.30**	2.39	.696***
Finland	-.763***	.826	.628**	-.232	.810	.697***
Germany	-.528***	.469	.683***	-.156*	.417	.425**
Hungary	-.353	2.66	.538**	-.477*	1.27	.647***
India	1.55**	2.25	.721***	.091	2.22	.733***
Ireland	-.398**	.515	.398*	.158	1.20	.709***
Israel	-7.54***	2.59	.091	-3.85***	2.76	.573**
Italy	-.288**	.624	.729***	.043	.352	.599***
Japan	-.409**	.789	.511**	.067	.753	.693***
Korea	-1.61**	2.16	.609**	-.451**	.767	.608***
Mexico	-.416	1.89	.568**	-.369**	.684	.651***
Netherlands	-.236**	.327	.693***	-.130	.583	.551**
Norway	.037	.698	.651***	-.281	1.26	.406**
Paraguay	-.818	2.88	.480**	-.623	1.90	.602***
Peru	-1.75***	1.20	.618**	-.406	1259	.748***
Philippines	-1.37**	1.84	.394*	-1.10**	1.59	.779***
Poland	.538	3.57	.360	-.988**	1.89	.683***
Russia	-.631	2.59	.729***	-1.72***	1.74	.670***
South Africa	-1.15**	2.13	.636**	-1.66**	3.18	.820***
Spain	-.228*	.538	.670***	.224	.595	.407**
Switzerland	-.278**	.375	.596**	-.161**	.351	.287
Thailand	-1.57**	3.15	.819***	-.166	1.12	.691***
Turkey	3.86**	7.85	.192	-2.45**	4.52	.579**
Ukraine	1.31	13.64	.769***	-.950	4.02	.781***
United States	-.139	1.63	.602**	-.550***	.633	.551**
Uruguay	-1.00	4.37	.438**	.299	0.902	.314

Announcement

Table F.9: Inflation Expectations: Full Sample around Announcement

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	18.95***	21.79	.813***	28.66***	7.30	.530**
Austria	2.91***	.783	.975***	1.85***	.520	.807***
Belgium	2.85***	.563	.925***	1.87***	.686	.777***
Brazil	864.80***	702.20	.836***	6.65***	3.37	.936***
Chile	26.52***	-	-	-	3.91	-
Colombia	14.36***	.937	.626	8.96***	6.80	.991***
Czech Republic	14.20357***	9.31	.832***	3.19***	2.25	.949***
Finland	3.92***	.734	.382	1.79***	.819	.869***
Germany	2.95***	.937	.969***	1.65***	.531	.831***
Hungary	19.76***	7.78	.958***	4.30***	2.06	.942***
India	7.36***	2.48	.883***	5.08***	.522	.683***
Ireland	2.74***	.394	.811***	2.20***	1.60	.918***
Israel	10.70***	3.37	-.303	3.62***	2.93	.918***
Italy	4.82***	1.34	.941***	1.87***	.744	.914***
Japan	.516***	.956	.925***	.75***	.570	.824***
Korea	6.93***	1.76	.754***	3.29***	1.42	.938***
Mexico	19.53***	12.49	.857***	5.90***	3.32	.981***
Netherlands	2.67***	.538	.881***	1.98***	.748	.882***
Norway	2.56***	.695	.828***	2.14***	.477	.665***
Paraguay	13.31***	4.38	.405**	6.04***	2.14	.859***
Peru	8.9***	-	-	-	.891	-
Philippines	33.01***	2.85	.842***	4.46***	1.51	.856***
Poland	127.74***	19.95	.752***	3.56***	2.74	.972***
Russia	10.13***	299.62	.892***	7.72***	3.22	.905***
South Africa	5.6***	2.66	.935***	6.14***	1.39	.842***
Spain	2.19***	1.22	.572**	2.45***	1.15	.920***
Switzerland	2.108333***	1.53	.973***	.756***	.627	.895***
Thailand	6.13***	1.83	.838***	2.62***	1.33	.795***
Turkey	71.50***	19.19	.761***	14.09***	13.43	.939***
Ukraine	12.94***	5.95	.890***	14.21***	8.87	.707***
United States	2.88***	.613	.899***	2.03***	.468	.593***
Uruguay	28.94***	23.29	.981***	7.68***	.996	.735***

Table F.10: Inflation: Full Sample around Announcement

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	14.84***	29.43	.961***	31.89***	9.24	.809***
Austria	2.62***	1.04	.917***	1.83***	.818	.857***
Belgium	2.36***	.574	.818***	1.87***	1.09	.823***
Brazil	1236.78***	1200.72	.816***	6.56***	3.37	.931***
Chile	-	-	-	3.45122	4.51	-
Colombia	27.86***	2.27	.843**	8.52***	6.69	.990***
Czech Republic	11.21***	4.71	.795***	2.63***	2.40	.909***
Finland	3.33***	.676	.898**	1.40***	1.12	.888***
Germany	2.99***	1.54	.904***	1.40***	.675	.817***
Hungary	19.59***	7.66	.956***	3.81***	2.41	.924***
India	7.80***	3.46	.859***	5.17***	1.96	.718***
Ireland	2.34***	.779	.830***	1.85***	2.38	.933***
Israel	3.13***	1.51	.252	.667***	1.16	.428***
Italy	4.34***	1.36	.956***	1.70***	1.02	.926***
Japan	.222**	1.09	.865***	.714***	1.03	.791***
Korea	5.83***	1.69	.773***	2.42***	1.38	.841***
Mexico	20.44***	12.07	.896***	5.51***	3.57	.977***
Netherlands	2.50***	.612	.852***	1.88***	.922	.882***
Norway	2.20***	.646	.705***	2.09***	1.05	.668***
Paraguay	12.15***	5.58	.842***	5.22***	2.79	.810***
Peru	-	769.01	-	-	4.15	-
Philippines	7.86***	3.77	.886***	3.73***	2.00	.869***
Poland	33.86***	17.29	.980***	3.08***	2.94	.957***
Russia	78.42***	185.49	.959***	6.71***	4.32	.893***
South Africa	9.67***	3.07	.897***	5.23***	2.69	.872***
Spain	5.23***	.741	.775***	2.23***	1.51	.901***
Switzerland	2.04***	1.96	.975***	.507***	.873	.853***
Thailand	4.73***	2.39	.868***	2.01***	1.92	.823***
Turkey	75.74***	18.42	.823***	13.54***	12.96	.959***
Ukraine	299.49**	1142.39	.800***	13.37***	9.93	.884***
United States	2.78***	.822	.665***	1.59***	1.06	.751***
Uruguay	29.30***	26.60	.991***	7.63***	1.33	.823***

Table F.11: Forecast Errors: Full Sample around Announcement

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	-4.10**	18.93	.672***	3.22	7.74	.713**
Austria	-.288**	.474	.539**	-.023	.691	.738***
Belgium	-.492***	.413	.530**	-.005	.868	.677***
Brazil	371.98**	616.58	.554**	-.089	1.87	.706***
Chile	-	-	-	-	1.57	-
Colombia	1.34**	1.74	.582	-.439**	1.78	.744***
Czech Republic	.288	3.78	.549**	-.557***	1.63	.714***
Finland	-.585**	.458	-.222	-.393***	.848	.753***
Germany	.040	.801	.699***	-.249***	.532	.588***
Hungary	-.169	2.91	.523***	-.486***	1.28	.648***
India	.446	2.93	.741***	.091	2.22	.733***
Ireland	-.396**	.631	.733***	-.353**	1.42	.817***
Israel	-8.03***	3.86	-.154	-2.95***	2.59	.727***
Italy	-.478***	.608	.722***	-.168**	.611	.737***
Japan	-.294***	.632	.550***	-.035	.687	.681***
Korea	-1.093***	1.56	.414**	-.870***	1.24	.766***
Mexico	.906	3.59	.320	-.388***	1.03	.645***
Netherlands	-.165	.516	.688***	-.097*	.542	.532***
Norway	-.359**	.673	.537***	-.047	1.01	.529***
Paraguay	-1.540**	4.057	.379**	-.820**	2.08	.500
Peru	-	-	-	-	1.19	-
Philippines	-1.03**	2.47	.519***	-.730***	1.64	.741***
Poland	.844	10.37	.230	-.484***	1.36	.668***
Russia	-23.98**	81.92	.702***	-1.00**	2.47	.618***
South Africa	-.460	1.85	.585***	-.910***	2.09	.782***
Spain	-.369	.872	.298	-.213**	.988	.677***
Switzerland	-.141	.569	.780***	-.249***	.509	.640***
Thailand	-1.40***	2.44	.817***	-.606***	1.56	.649***
Turkey	4.24**	12.44	-.010	-.553	3.65	.498***
Ukraine	-.009	8.57	.837***	-.837	4.61	.607**
United States	-.103	.773	.552***	-.438**	1.02	.694***
Uruguay	.366	5.87	.616***	-.046	1.22	.656***

Table F.12: Inflation Expectations: 5 years around Announcement

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	27.12***	5.07	.861***	31.78***	9.01	.647**
Austria	2.68***	.710	.967***	1.62***	.469	.791***
Belgium	2.85***	.563	.925***	1.81***	.374	.761***
Brazil	1019.68***	655.4	.841***	13.12***	11.53	.659***
Chile	-	-	-	-	-	-
Colombia	26.52***	.937	.626	20.53***	1.36	.644***
Czech Republic	11.18***	2.89	.737***	6.3***	2.94	.931***
Finland	3.92***	.734	.382	2.07***	.824	.830***
Germany	2.54***	.769	.958***	1.58***	.457	.823***
Hungary	14.89***	5.51	.965***	5.88***	1.78	.913***
India	7.52***	.644	.537**	5.08***	.522	.683***
Ireland	2.67***	.388	.823***	3.32***	1.21	.881***
Israel	11.16***	3.53	-.400	8.25***	2.99	.737***
Italy	4.27***	1.167	.918***	2.29***	.404	.880***
Japan	.195	.736	.769***	.704***	.653	.823***
Korea	5.87***	.625	.400**	4.62***	2.00	.852***
Mexico	21.25***	14.37	.853***	9.67***	4.50	.974***
Netherlands	2.41***	.235	.746***	2.75***	.739	.742***
Norway	2.27***	.481	.634**	2.31***	.587	.736***
Paraguay	11.81***	2.95	.542**	8.18***	1.87	.590**
Peru	-	-	-	-	-	-
Philippines	7.75***	1.61	.326	5.70***	1.20	.861***
Poland	24.71***	7.12	.868***	6.60***	3.38	.969***
Russia	10.18***	2.40	.910***	8.04***	3.21	.901***
South Africa	8.55***	1.24	.732***	6.66***	1.37	.835***
Spain	5.95***	1.11	.341	3.19***	1.08	.972***
Switzerland	1.22***	.563	.835***	1.05***	.383	.858***
Thailand	6.49***	2.25	.835***	2.53***	.763	.768***
Turkey	70.52***	18.82	.804***	25.20***	19.68	.915***
Ukraine	10.21***	3.89	.778***	14.92***	8.71	.706***
United States	2.67***	.384	.758***	2.27***	.723	.656***
Uruguay	10.97***	8.30	.867***	7.36***	1.14	.531**

Table F.13: Inflation: 5 years around Announcement

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	12.87***	4.80	.892***	33.67***	13.84	.937***
Austria	2.25***	.877	.892***	1.62***	.809	.914***
Belgium	2.36***	.574	.818***	1.83***	.735	.753***
Brazil	1460.50***	1179.76	.770***	12.06***	16.22	.960***
Chile	-	-	-	-	-	-
Colombia	27.86***	2.27	.843**	20.32***	2.07	.814***
Czech Republic	11.53***	4.95	.790***	4.99***	3.77	.900***
Finland	3.33***	.676	.898**	1.12***	.657	.732***
Germany	2.28***	1.04	.931***	1.21***	.553	.746***
Hungary	14.32***	4.90	.982***	5.47***	2.03	.847***
India	9.07***	2.07	.771***	5.17***	1.96	.718***
Ireland	2.11***	.628	.756***	3.58***	1.71	.913***
Israel	2.99***	1.59	.285	1.92***	1.52	.209
Italy	3.86***	1.26	.937***	2.35***	.448	.881***
Japan	-.158	1.06	.784***	.742**	1.18	.811***
Korea	5.19***	1.17	.422*	3.25***	1.88	.805***
Mexico	21.72***	13.93	.895***	9.21***	5.11	.977***
Netherlands	2.25***	.430	.810***	2.63***	.893	.906***
Norway	2.03***	.611	.641**	2.06***	1.29	.597**
Paraguay	9.23***	4.20	.646**	6.91***	3.29	.749***
Peru	-	769.01	-	2.884722	-	-
Philippines	6.30***	2.11	.853***	4.43***	1.78	.898***
Poland	25.24***	8.51	.982***	5.62***	3.97	.957***
Russia	8.948***	3.49	.915***	7.20***	4.29	.885***
South Africa	8.036***	1.58	.582**	4.88***	4.07	.848***
Spain	5.38***	.752	.741**	3.09***	1.20	.947***
Switzerland	.800***	.660	.798***	.906***	.470	.656***
Thailand	4.91***	3.12	.874***	2.367***	1.56	.903***
Turkey	72.38***	16.65	.932***	23.76***	20.79	.940***
Ukraine	7.21**	9.17	.905***	17.64***	16.19	.866***
United States	2.94***	.766	.593**	1.86***	1.53	.703***
Uruguay	9.83***	8.17	.861***	7.11***	1.49	.793***

Table F.14: Forecast Errors: 5 years around Announcement

Country Name	$E(\pi^e_{t,pre})$	σ_{pre}	ρ_{pre}	$E(\pi^e_{t,post})$	σ_{post}	ρ_{post}
Argentina	-14.25***	3.20	.439**	1.89	11.59	.806***
Austria	-.425***	.442	.435**	-.003	.688	.810***
Belgium	-.492***	.413	.530**	.013	.621	.519**
Brazil	440.82**	651.23	.512**	-1.06	8.31	-.941***
Chile	-	-	-	3.45122	2.05	-
Colombia	1.34*	1.740	.582	-.212	1.97	.402**
Czech Republic	.351	4.04	.546**	-1.30**	2.39	.696***
Finland	-.585**	.458	-.222	-.952***	.879	.661***
Germany	-.262**	.568	.711***	-.369***	.462	.524**
Hungary	-.562	1.95	.590**	-.403	1.48	.659***
India	1.55**	2.25	.721***	.091	2.22	.733***
Ireland	-.551***	.567	.655***	.255	1.06	.687***
Israel	-8.77***	3.87	-.390	-6.33***	3.05	.500**
Italy	-.402**	.666	.762***	.061	.343	.588**
Japan	-.353*	.819	.518**	.038	.770	.732***
Korea	-.671**	1.40	.372	-1.36***	1.91	.716***
Mexico	.477	4.01	.343	-.459	1.57	.723***
Netherlands	-.157*	.392	.678***	-.121	.571	.520**
Norway	-.235	.746	.522**	-.247	1.28	.435**
Paraguay	-2.57**	3.82	.506**	-1.26**	2.91	.482**
Peru	-	-	-	-	.888	-
Philippines	-1.45**	1.83	.392**	-1.27***	1.51	.811***
Poland	.538	3.57	.360	-.988**	1.89	.683***
Russia	-1.23**	2.41	.820***	-.831	2.55	.619***
South Africa	-.518	1.91	.598**	-1.77**	3.26	.805***
Spain	-.569**	.857	.041	-.103	.568	.723***
Switzerland	-.424***	.302	.394**	-.151*	.396	.324
Thailand	-1.57**	3.15	.819***	-.166	1.12	.691***
Turkey	1.86	9.01	.206	-1.44	6.80	.304
Ukraine	-2.99*	6.76	.769***	2.72	11.93	.765***
United States	.276	.672	.309	-.413	1.42	.613***
Uruguay	-1.14	4.23	.440**	-.250	1.55	.508**

G Rational Expectation Hypothesis

Table G.15: Rational Expectations Test

Country Name	Pre-IT	Post-IT
Argentina	.431***	.529***
	(.099)	(0.069)
Austria	.296***	.659***
	(.048)	(0.059)
Belgium	.202	.611***
	(.128)	(0.511)
Brazil	.410***	.455***
	(.046)	(0.077)
Chile	.167***	.650***
	(.041)	(0.055)
Colombia	.355***	-.162
	(.062)	(0.221)
Czech Republic	.654***	.269**
	(.134)	(.142)
Finland	.401**	.521***
	(.147)	(.057)
Germany	.448***	.470***
	(.038)	(0.070)
Hungary	.054	.290***
	(.072)	(0.080)
India	.592***	1.139***
	(.150)	(0.042)
Ireland	.695***	.449***
	(.095)	(0.082)
Israel	2.22**	0.693***
	(.0672)	(0.207)
Italy	.038	0.411***
	(.089)	(0.054)
Japan	.288**	.598***

Table G.15: Rational Expectations Test

Country Name	Pre-IT	Post-IT
	(.094)	(.081)
Korea	.526**	.539***
	(.211)	(.114)
Mexico	.041	.396**
	(.058)	(.135)
Netherlands	.467***	.343***
	(.130)	(.083)
Norway	.612**	.881***
	(.221)	(.059)
Paraguay	.343***	.535**
	(.086)	(.224)
Peru	.572***	.669***
	(.074)	(.067)
Philippines	.430***	.547***
	(.064)	(.107)
Poland	.034	.262***
	(.122)	(.059)
Russia	-.367***	.385***
	(.019)	(.102)
South Africa	.355***	.652***
	(.070)	(.098)
Spain	.025	.487***
	(.141)	(.052)
Switzerland	.225***	.401***
	(.049)	(.077)
Thailand	.673***	.592***
	(.145)	(.081)
Turkey	.187	-.082
	(.130)	(.080)
Ukraine	.564***	.968***

Table G.15: Rational Expectations Test

Country Name	Pre-IT	Post-IT
	(.089)	(.171)
United States	.689***	.791***
	(.094)	(.070)
Uruguay	.130**	.588***
	(.041)	(.105)

Note: Newey West standard errors in parenthesis.