Inflation Targeting and the Legacy of High Inflation*

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Abstract

As inflation targeting (IT) turns 35, it has become a key institutional monetary framework by central banks. Yet, this paper shows that stark differences exist among inflation targeting countries in the conduct of monetary policy. Behind such heterogeneity, the legacy of a high inflation history appears as a preponderant factor. We propose a model that diverges from existing IT workhorse models by adding path-dependence (to a forward-looking model) and potentially imperfect central bank credibility. In turn, we provide empirical evidence that countries that experienced a high level of inflation before adopting the IT regime tend to respond more aggressively to deviations of inflation expectations from the central bank's target and the existence of a credibility puzzle, whereby the strength of a central bank's monetary policy response to deviations from the inflation target remains broadly unchanged even as central banks gain credibility over time. Put differently, a country's inflationary past casts a long and persistent shadow on central banks.

Keywords: Inflation Targeting, Central Banking, Past Inflation

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1. Introduction

Inflation targeting (IT) has been established as a key institutional monetary framework and has become the workhorse for the efficient conduct of monetary policy in central banks in advanced economies and in an increasing number of emerging markets and developing economies. There is a vast literature, both theoretical and empirical, focusing on the workings of the IT framework and the dynamic response of key macroeconomic variables. Yet, all these studies rest, among others, on two key assumptions (e.g., Woodford, 2003). First, inflation targeting central banks' reaction function is not path-dependent, in the sense that countries' characteristics prior to the adoption of IT, in particular the history of high inflation, do not affect the central bank's monetary policy rule. Second, central banks are perfectly credible.

In this paper, we challenge these assumptions theoretically and empirically. Theoretically, we embed path dependence in an otherwise standard Dynamic New Keynesian Model. We show that, if the economy experienced an episode of high inflation in the past that affects expectation formation, achieving the inflation target is more costly in terms of lost output and requires a more hawkish monetary stance relative to rational expectations. We also show that although expectations are exclusively shaped by events occurring in the past, the cost of inflation stabilization depends not only on how agents discount the past but also on how they discount the future.

In turn, our empirical findings suggest that IT central banks, given their legacy of high past inflation, have "fear of past inflation," which challenges the two important assumptions from the received wisdom. On the one hand, unlike existing theory, central bank credibility can't be assumed. We show evidence that suggests, in fact, that fear of de-anchoring inflation expectations (especially in countries with a high inflationary past) is an important driver of the conduct of monetary policy in inflation targeting countries. On the other hand, we highlight the importance of factoring in path dependence explicitly, given the prominent role of a country's past inflationary experience; that is, the importance of having had high inflation in the past. The combination of these two issues is what generates a credibility puzzle and the relevance of a country's past inflation experience in delineating the strength of the reaction function of central banks to expected inflation shocks.

Specifically, we point to the legacy of past high inflation in the conduct of monetary policy, as we show that having experienced high inflation prior to the establishment of the IT regime is the key factor shaping a central bank's response to contemporaneous inflation gaps. We also highlight the preponderant weight that central banks put on anchoring inflation expectations when setting interest rates by showing that inflation targeting central banks display a stronger response to deviations of inflation expectations from target than to deviations of observed inflation (in line with received theory, e.g., Svensson, 1997). We argue that these factors point to the existence of the mentioned credibility puzzle—in that the weight of inflationary past appears to persist even as central banks build credibility and that, in fact, inflation targeting central banks' reaction function are mostly time-invariant.

We squarely focus on studying and comparing only countries following IT, looking at them in a granular fashion. We exploit empirically IT countries' institutional and economic diversity to ascertain the nature of the central banks' reaction function and pin down the key factors affecting it. We stress that inflation targeting countries are heterogeneous, as their inflation background is

remarkably diverse, they differ on their level of income, their financial sector development and capital account openness, and several countries feature financial dollarization. Moreover, some countries are more vulnerable than others to real shocks and central bank independence and transparency vary across countries.

Methodologically, we estimate panel regressions in the spirit of Guerra and others (2024) to study the conduct of monetary policy among IT central banks. We specify a standard small open economy Taylor rule that, in addition to taking into account the output and inflation gaps, controls for variations in the country's exchange rate and for global financial conditions. The latter two variables are particularly important for emerging markets, which comprise a large fraction of our sample. To explore monetary policy heterogeneity among our group of countries, we augment our baseline panel regressions by allowing a country's policy rate response to both the output and expected inflation gap to vary with country specific characteristics, including the country's average level of past inflation (i.e., up to a decade prior to the adoption of the IT regime) and factoring in the Phillips and IS curves (as given in theoretical models).

Our results point to the statistically and economically significant role played by past inflation in explaining differences in the response of policy rates to the inflation gap. We find that, on average, for any one percent deviation of expected inflation from its target, a central bank changes its policy interest rate by between 20 a 30 basis points. And that for economies that experienced high inflation in the past, interest rates move by an additional 25-27 basis points. Alternatively, we also estimate country-by-country Taylor rules and associate these coefficients with the variables of interest (Annex II), with findings from the two exercises being broadly aligned.

Literature Review. This paper contributes to a large literature on inflation targeting, which flourished in the 2000s up until the Great Financial Crisis (GFC). Ball (2010), Svensson (2010), and Walsh (2009) summarize three important results from these studies: (i) inflation targeting, when compared to non-inflation targeting countries, has made a difference in terms of achieving low and stable inflation in emerging market economies, but not so much in advanced economies; (ii) an explicit inflation target stabilizes inflation expectations and help handle supply shocks; and (iii) inflation targeting has not been associated with output growth but can reduce output volatility in emerging market economies. Interest in studying inflation targeting subsided in the aftermath of the GFC, as inflation plummeted and attention shifted to assessing the effects of the unconventional monetary policies but re-emerged after a surge of inflation following the Covid pandemic. Recent papers include Guerra and others (2024), who explore changes in Taylor rules in the aftermath of Covid among Latin American countries, Zhang and Wang (2022), which highlights the effects of the inflation-targeting countries' track record on macroeconomic outcomes, Bhalla et al. (2023) that revisit the impact of adopting inflation targeting on anchoring inflation expectations in a sample of advanced economies and emerging markets and developing countries, and find better outcomes on early inflation-targeting adopters, and Duncan et al. (2022) that focuses on assessing the effectiveness of inflation targeting in the same type of countries, and find stronger results in emerging markets and developing countries.

Our work diverges from most previous papers in two important ways. First, those studies rest on the premise that inflation-targeting countries are a homogenous group and, thus, conduct monetary

policy in a uniform manner. In contrast, our study digs into the differences observed among inflation-targeting countries aiming at unveiling whether their economic and institutional features and heterogeneity help to explain the way central banks conduct monetary policy. Second, our paper explores the role played by the countries' history of inflation when taking monetary policy decisions, an angle that, to the best of our knowledge, has not been previously addressed.

Our analysis relates, alternatively, to a novel literature that underscores the importance of inflation history on individuals' inflation expectations. This include Malmendier and Nagel (2016), which documents that older individuals in the US tend to have higher inflation expectations, Magud and Pienknagura (2024) who show that cross-country cohorts of individuals (going back to those born in the early 1920s) that were exposed to longer bouts of high inflation were more averse to inflation in general and in particular to unexpected inflationary shocks, and Gennaioli et al. (2024) that document that in the US, during the Covid inflation shocks, older people expected higher inflation rates than younger individuals. Relatedly, Malmendier and Nagel (2011) show how individuals that experienced the great depression in the US were more risk averse—including staying away from investing in the stock market (see also Malmendier and others, 2020), whereas Binder and Makridis (2020) find that individuals that experienced the 1970s oil shocks in the US had higher inflation expectations than other people, and Giuliano and Spilimbergo (2023 and 2024) that document the role of aggregate shocks in individuals' expectations. All these studies focus on individuals' expectations as driven by personal experience. Instead, our work focuses on the policymaking side. It could thus be more closely associated with Malmendier and others (2021) that show how FOMC policymakers that were exposed to high inflation when younger in other countries tend to systematically vote for more hawkish policy decisions.[1] Our paper takes for granted individuals' reaction and implicitly assess how the policymaker internalizes aggregate choice. Along these lines, from a theoretical perspective, our analysis in consistent with Rogoff (1985) who, in the context of simple Barro-Gordon model, shows the need for a central bank that is more conservative (in terms of monetary policy preferences) than the average individual. See also Afrouzi and others (2024) for a similar point.

The rest of the paper is structured as follows: Section II presents the theoretical model on which the empirical section is based; Section III describes the empirical specification used to conduct the analysis and the data feeding the study; Section IV discuss the main results in the context of received theoretical assumptions about Taylor rules and presents various robustness tests; Section V distills the main conclusions of the paper. The Annex elaborates on the typically ignored heterogeneity among inflation targeting central banks.

2. A Simple Model of High Inflation History and Monetary Policy

Before turning to presenting the results of our econometric estimation, and to fix ideas, this section presents a simple New-Keynesian (NK) model that incorporates experienced learning (the legacy of past inflation). A young but growing empirical literature documents that past episodes of high inflation significantly affect current inflation expectations. This phenomenon is known as experience learning. The model in this section explores the implications of incorporating experienced learning in

[1] Erceg and Levin theoretical study the role of imperfect credibility of the inflation target rather than the degree of credibility as reflected in how well-anchored inflation expectations are (that is, the gap between expected inflation and the inflation target), as we do.

an otherwise standard NK model. First, the section characterizes the optimal monetary policy when the experienced learning channel is turned off. Then it presents how experienced learning affects optimal monetary policy and how this affects the costs of economic stabilization.

2.1. The Rational Expectations Benchmark

Consider a three-equation linear new-Keynesian model. The Euler equation is of the form:

$$y_t = E_t y_{t+1} - \frac{1}{\sigma}(i_t - E_t \pi_{t+1}) \qquad (1)$$

where π_t is the deviation of inflation from the intended target, y_t is the output gap, i_t is the nominal interest rate expressed in deviation from its steady-state level, and E_t is the expectation operator conditional on relevant information in period *t* (which will depend on the expectation model being considered). The parameter $\sigma > 0$ is the intertemporal elasticity of consumption substitution. The Euler equation states that output growth is decreasing in the expected real interest rate.

The Phillips curve takes the form:

$$\pi_t = \beta E_t \pi_{t+1} + \kappa y_t \qquad (2)$$

where $\beta \in (0,1)$ is the subjective discount factor and $\kappa > 0$ is a parameter that is decreasing in the degree of price stickiness. The fact that in the Phillips curve current inflation depends not only on the current output gap but also on people's expectations about future inflation will play a central role in determining the cost of inflation stabilization under alternative assumptions about how expectations are formed.

Assume that the central bank implements strict inflation targeting, so that:

$$\pi_t = 0 \qquad (3)$$

for all $t \geq 0$. We assume that the central bank can commit to maintaining this policy over time. The question we tackle is how costly it to implement this policy in terms of the output gap y_t and what does it imply for the level of the policy rate i_t.

Our simple three-equation framework suggests that under rational expectations, the fact that $\pi_t = 0$ for all *t* implies that the conditional expectation of inflation, $E_t \pi_{t+1}$, must also be zero. Plugging $E_t \pi_{t+1} = 0$ in the Phillips curve (2) yields

$$y_t = 0$$

for all *t*. Thus, under rational expectations it is costless to fully stabilize inflation, the well-known result sometimes referred to as the "divine coincidence:" in the absence of cost-push shocks, the rational expectations solution of the new-Keynesian model implies that inflation stabilization goes in tandem with output stabilization.

Consider now the equilibrium path of the nominal interest rate that supports this outcome. Using $y_t = E_t y_{t+1} = E_t \pi_{t+1} = 0$, we can solve the Euler equation (1) for the equilibrium interest rate, to get:

$$i_t = 0$$

for all t, which says that to achieve price and output stability, the government does not need to deviate the policy rate from its steady-state value (typically referred to as the natural or neutral interest rate). In other words, macroeconomic stabilization is not associated with a particularly dovish or hawkish monetary policy. As we will see next, this will cease to be the case under experience learning.

2.2. Stabilization Under Experience Learning

To model experience learning, we assume that if the economy suffered high inflation in the past, denoted $\pi^H > 0$, then inflationary expectations evolve over time according to the expression:

$$E_t\pi_{t+1} = \lambda^t\pi^H$$

Here, the inflationary episode occurs in period 0, and the parameter $\lambda \in (0,1)$ denotes the rate of decay of the inflationary memory. The formulation with memory depreciation is in line with empirical studies that document "recency bias" in experience learning (Malmendier and Nagel, 2016; Magud and Penknagura, 2024).

Let's now address the same question we answered in the economy with rational expectations, namely, how costly is it to stabilize the rate of inflation and what is the path of the policy rate consistent with this goal. Using $\pi_t = 0$ and $E_t\pi_{t+1} = \lambda^t\pi^H$ and plugging them to the Phillips curve (2), we see immediately that:

$$y_t = -\frac{\beta\lambda^t\pi^H}{\kappa}$$

This expression reveals that experience learning imposes costs on inflation stabilization. Specifically, the output gap becomes negative for as long as the memory of a bad inflationary episode persists. The intuition behind this result is straightforward. In the New Keynesian framework, the current deviation of inflation from target equals the present discounted value of current and future marginal costs. If a prior inflationary experience leads people to believe that marginal costs will remain high in the future, the central bank must preemptively cool the economy to prevent inflation in the present. This requires inducing a negative output gap. The cost in terms of lost output depends on several factors: (a) the severity of the past inflationary exposure (π^H), with larger exposure amplifying the cost; (b) the recency of the exposure (smaller t), as more recent episodes weigh more heavily on expectations; (c) the persistence of the memory of the exposure (larger λ), which prolongs the economic effects of inflationary history; (d) the degree of price stickiness (smaller κ), with stickier prices exacerbating the output loss; and (e) the subjective discount factor: Even though experience learning looks back in time (that is, it is backward-looking), the magnitude of the cost of inflation the cost of stabilization depends not only on the rate at which people discount the past, λ, but also on the rate at which people discount the future, β. This is because the former determines the expected size of marginal costs in the future, while the latter determines their present value. Thus, both backward- and forward-looking issues are relevant in equilibrium.

How does experience learning affect monetary policy? To calculate the path of the nominal interest rate, i_t, consistent with strict inflation targeting, substitute in the Euler equation (1) the values of y_t, $E_t y_{t+1}$, and $E_t \pi_{t+1}$ implied by equations (4) and (5). This gives:

$$i_t = \left[1 + \frac{\beta\sigma}{\kappa}(1 - \lambda)\right] \lambda^t \pi^H$$

The nominal interest rate is above its steady-state level throughout the transition. Thus, under experience learning, inflation stabilization requires a more hawkish monetary policy stance relative to rational expectations if inflation is to be stabilized. The required tightening is more severe the larger the inflation exposure, π^H, the stickier prices are (the smaller κ is), and the more risk averse agents are (the higher σ is).

In other words, despite inflation expectations being rational, the issue arises when agents may have doubts in regard to the ability of the central bank to achieve its inflation target, that is when inflation expectations are not perfectly anchored. This drives the central bank to optimally be willing to pay the real cost (in terms of a recession) needed to keep inflation expectations anchored. Thus, the backward-looking component of inflation combines with the forward looking aspect of inflation expectations, highlighting the role of path dependence and the importance of central bank credibility in the optimal response of the central banks to inflation shocks.

The rest of the paper tests empirically the relationship between past inflation (experienced learning) and the conduct of monetary policy. In particular, it focuses on studying how past inflation affects the central bank's response to inflation. In line with the simple model, results point to central banks in countries with a history of high inflation being more responsive to inflation deviations (more hawkish).

3. Econometric Strategy and Data

This section describes the empirical methods used to estimate central banks' monetary policy reaction function and the data sources used in the analysis and their limitations.

3.1. Econometric Specification

To study IT central banks' monetary policy functions, this paper estimates Taylor rules through a panel approach.[2] The baseline specification takes the following form:

$$i_{c,t} = \alpha_c + \rho i_{c,t-1} + \beta\, inf.gap_{c,t} + \gamma\, Y\, gap_{c,t} + \theta \Delta NEER_{c,t} + \mu \Delta NEER_{c,t-1} + \vartheta\, i._{\mathrm{US},t-1} + \varepsilon_{c,t} \quad (4)$$

where $i_{c,t}$ is the policy rate in country *c,* at time *t,* α_c is a country fixed effect*,* $Y\, gap_{c,t}$ is the output gap in country *c* at time *t,* as measured after computing potential output byway of detrending using the HP filter*,* $\Delta NEER_{c,t}$ is the change in the nominal effective exchange rate in period *t,* $i._{\mathrm{US},t-1}$ is the monetary policy rate in the US at time *t-1*[3], and $inf.gap_{c,t}$ is the inflation gap in country *c* at time *t.* We use three alternative gauges of the inflation gap—one that calculates the deviation of

[2] Results stemming from country-by-country estimations are show in Annex III.

[3] In some exercises we expand the baseline specification by replacing the US monetary policy rate with time fixed effect aimed at capturing global factors, beyond financial conditions, affecting all countries in our sample.

contemporaneous headline inflation from the central bank's inflation target, another that computes deviations of contemporaneous core inflation from the target, and another that measures the deviation of one-year ahead inflation expectations from the inflation target. The latter is closer in spirit to the theoretical underpinnings behind the Taylor rule (Svensson, 1997). The inclusion of the output and inflation gaps follows the standard Taylor rule formulation. We augment the standard Taylor rule by including changes in the nominal exchange rate and by controlling for the US monetary policy rate, two important variables for small open economies (Ghosh, Ostry, and Chamon, 2016), and the lagged interest rate to smooth for interest rate persistence.

In some exercises we also include the years as an IT that each central bank has,[4] aimed at capturing the potential evolution in the conduct of monetary policy as central banks become more established inflation targeters. We also explore whether the years a central bank has under an IT regime affects the response of monetary policy to the inflation and output gaps by interacting each gap with the years as an IT.

To study heterogeneity in the conduct of monetary policy across IT central banks, the main objective of this paper, we estimate a variant of equation (1) which allows the coefficients for the inflation and the output gaps to vary with the country-specific variables highlighted in the previous section. More precisely, we estimate the following equation:

$$i_{c,t} = \alpha_c + \rho i_{c,t-1} + \beta\, inf.gap_{c,t} + \gamma\, Y\, gap_{c,t} + \sum_{f \epsilon F} z_c^f (\delta^h\, inf.gap_{c,t} + \tau^h\, Y\, gap_{c,t}) + \theta \Delta NEER_{c,t} + \mu \Delta NEER_{c,t-1} + \vartheta\, i._{US,t-1} + \varepsilon_{c,t} \qquad (5)$$

Where *z* is a variable indicating whether fundamental *f*$\in F$ *={financial development, trade openness, capital account openness, central bank independence, past inflation}* was high at the time of IT adoption. To explore the robustness of our results we also estimate (5) using the relevant country-level variables in levels, both at the time of IT adoption and at each point in time.

3.2. Data

We rely on several data sources to conduct the econometric analysis discussed above. Data on inflation expectations come from consensus forecasts collected by Consensus Economics. These are survey-based inflation forecasts from professional forecasters. The number and type of forecasters considered in the surveys varies by country. But there are alternative ways to measure inflation expectations. Compared to household or firm surveys gauging inflation expectations, the data from consensus forecasts has the advantage that is consistently collected for a large sample of countries and is available for an extended time period. Moreover, there is evidence that household inflation expectations as measured in surveys could be sensitive to the way that survey questions are formulated and/or to inadvertent nudging and priming (Weber and others, 2022). Sampling and low response rates can also be an issue, particularly for firm surveys, for which the opportunity cost of responding is high[5].

[4] This is controlled for in two ways—as a linear function of the years as an IT and as fixed effects.

[5] One potential drawback of surveys filled by experts is that their forecasts may not be reflective of those of the relevant economic agents (consumers, workers, firms). There are also potential biases introduced by incentives for respondents not to reveal their true beliefs

Data on inflation targets and policy rates are collected from the BIS, and in the case of targets, complemented using information reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). In the case of countries reporting a target band, we use the mid-point of the band as our gauge of the target.

Data on nominal effective exchange rates and inflation come from the IMF's International Financial Statistics (IFS). Output gaps are computed using quarterly real GDP information from national sources retrieved by using Haver analytics. Data are seasonally adjusted by either national authorities or, if not available, by using Haver's seasonal adjustment. The output gap is calculated using the HP filter.

Data used to explore cross-country heterogeneity in monetary policy responses come from several sources. To gauge a country's financial development we use the index proposed by Svirydzenka (2016) and Sahay and others (2015). This is an index summarizing how developed financial institutions and financial markets are in terms of their depth, access, and efficiency. We proxy trade openness by using the trade over GDP ratio reported in the World Bank's World Development Indicators (WDI). Data on central bank independence comes from Romelli (2022, 2024). The index summarizes information on 6 dimensions of central bank independence: (i) governor and central bank board, (ii) monetary policy and conflict resolution, (iii) objectives, (iv) limitations on lending to the government, (v) financial independence, and (vi) reporting and disclosure. Capital account openness comes from the Chinn-Ito capital account openness (KA openness) index. In some exercises, we complement the KA openness index with data on foreign exchange rate interventions (FXI) from Adler and others (forthcoming), which allows to correct for the fact that countries with an open capital account may intervene, in some cases very frequently, in FX markets. We use the classification in Aslam and others (2016) to identify commodity exporting countries.

Finally, and critical to this paper, data on past inflationary experience is constructed as follows. For each country, we compute the average inflation rate from either 1960, or the first year for which the country appears in WDI, to ten years before the adoption of the IT regime. Using this information, we compute two variables: one is a dummy variable taking value one if the country had an average historical inflation above the 75th percentile value in our sample, and the other is a continuous transformation of the historical average inflation that compresses the distribution to account for countries that experienced hyperinflation. The transformation, which computes $\bar{\pi} = \pi/(100 + \pi)$, has been used in Jácome and Pienknagura (forthcoming) and Acemoglu and others (2008).

Table 1 presents summary statistics for the key variables used in the analysis. Table 2 shows the sample of countries used in the analysis, which includes all countries with central banks following an inflation targeting framework, according to the AREAER, that adopted the regime prior to 2015.

(Coibion, Gorodnichenko,and Kamdar, 2018). Yet, empirical work suggests that expectations by professional forecasters and firms have better predictive power as far as current inflation is concerned relative to (median or average) household expectations (IMF, 2023) and there are also biases in household and firm surveys, which may reflect the possibility that these agents pay less attention to policy announcements (Weber and others, 2022).

4. Results

This section presents the three main empirical results of the paper. First, it explores differences in the reaction of policy rates to the three inflation gaps used in the analysis—the one using contemporaneous headline inflation, the one using contemporaneous core inflation, and the one using inflation expectations—and how Taylor rules differ across groups of countries. Second, the analysis turns to assessing the extent to which Taylor rules change over time. More precisely it studies whether countries with more established IT regimes, as measured by the time since adoption, conduct monetary policy in a different manner relative to countries that have adopted the regime more recently. Third, it presents an empirical exploration of how past inflationary history shapes monetary policy among IT central banks. Finally, it presents a battery of robustness exercises.

4.1. Drivers of Monetary Policy and Cross-Country Heterogeneity: The Legacy of Past Inflation

Before exploring the role of past inflationary history in shaping monetary policy, Table 3 presents results for the baseline Taylor rule estimations. Following the received wisdom of theoretical models of inflation targeting (Svensson, 1997), our results point to a larger elasticity of policy rates to inflation expectations gaps compared to observed headline and core inflation gaps. The coefficients corresponding to the expected inflation gap more than double of those of the observed inflation gap (be it headline or core). Notice that they are not only statistically, but also economically significant: a one percent deviation of expected inflation from the target triggers on average a change in the policy interest rate of around 20-22 basis points—compared than less than 10 basis points for metrics of observed inflation. Moreover, results are robust to the inclusion of time fixed effects and a set of dummy variables capturing the years as an IT of the central bank. These suggest that, unlike in pure theoretical models, a central bank' reaction function includes mitigating the effects of possible second-round inflationary effect, as provided by observed inflation gaps. However, deviations of inflation expectations from the target carry a much larger interest rate reaction, as the role on Taylor rules is to anchor inflation expectations, the key nominal anchor of inflation targeting central banks. This also relates to Taylor rule response to supply or demand shocks (which we specifically control for in the robustness checks' section), as in theory the central bank should only react to demand shocks, but still cares for inflation expectations not de-anchoring when a supply shock hits the economy. Moving forward, we will stick to using the expected inflation gap as the baseline–results with the observed inflation gap are available from the authors upon request.

Moreover, the estimated impacts of controls in Table 3 are aligned with basic economic intuition and in line with recent work estimating Taylor rules (Guerra and others, 2024). We find strong persistence of policy interest rates, as given by the positive and highly significant coefficient of the lagged interest rate. We also observe the autoregressive nature of changes in the nominal effective exchange rate, which shows some easing of interest rates on impact, followed by an increase in the policy interest rate the following quarter as depreciation pressures pass-through to domestic prices, resulting in hiking interest rates. Our findings are also supportive of the role of the global financial cycle (Rey, 2013), in that policy rates move in tandem with US interest rates. Moreover, the use of Taylor rules in inflation targeting countries shows the importance of deviations of output from its

potential, with the central bank tightening interest rates when observed output is larger than potential output (that is a positive output gap that would result in inflationary pressures). That said, the magnitude of the latter's coefficient is much smaller than that of the expected inflation gap.[6]

Next, we assess whether the estimated Taylor rules vary with the level of income. As mentioned, AEs and EMDEs in our sample vary along several dimensions that may shape their monetary policy response to deviations from the inflation target and to the output gap. We find that the response of policy interest rates to expected inflation gaps is positive and statistically significant in both income groups in our baseline specification (Table 4, columns 1-3). Of interest, note that within EMDEs, those that adopted an inflation targeting regime earlier (prior to 2006) are found to respond more forcefully to deviations in the expected inflation gap–the Taylor rule coefficient is about two times that of late adopters among EMDEs and also compared to AEs, reporting close to 40 basis point change for any one percentage point deviation of expected inflation from its target. The stronger response by EMDEs that adopted the IT regime earlier is also found in alternative specification that control for time fixed effects and years as IT fixed effects. Moreover, the size and statistical significance of the coefficient for EMDEs that adopted the IT regime earlier do not vary much in the different specifications, something that does not hold for AEs and other EMDEs. The stronger response of early IT adopters to the expected inflation gap is presumably linked to differences in their inflationary history, as they comprise countries like Brazil, Peru, and Poland, among others, that experienced bouts of very high inflation in the 1980s, potentially translating in a stronger need to react to inflation expectations deviations. The link between the country's inflationary history and a central bank's monetary policy response is studied in more detail later in this paper.

We turn to exploring the stability of the inflation gap and output gap coefficients. One would expect that as central banks build their credibility over time, they would need a smaller change in the policy interest rate for a similar size inflation gap shock.[7] Put differently, more established central banks, one would expect, would have smaller inflation gap coefficients to the extent they build credibility over time. To test for this, we interact the expected inflation and output gaps with the number of years that a central bank has been conducting its monetary policy under an inflation targeting framework.

Our results show that the response of the interest rate to the expected inflation gap does not systematically vary over time (Table 5). In fact, a longer track record of consistent inflation targeting does not translate to smaller interest rate movements for similar expected deviation gaps. Table 5 shows that, although the coefficient is, as expected, negative, it is also quite small and not statistically significant, triggering the existence of what we label the credibility puzzle. This, so called, credibility puzzle holds under different configurations of fixed effects and regardless of whether we control years as IT linearly or through fixed effects.[8]

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[6] Note that in the textbook Taylor rule, the central bank's response to the inflation gap should be greater than one to ensure determinacy of inflation expectations. In our formulation, which includes the interest rate's lag, this entails that $\beta/(1-\rho)$ should be greater than one. Table 2 shows that his is in fact the case of the inflation expectation gap.

[7] As in Benati and Surico (2009) and Baxa and others (2013).

[8] One could argue that our findings are driven by the fact that our estimates rely on approximately 35 years of information at best, and that it may take longer for credibility to start shaping monetary policy in a systematic way. However, analysis about the behavior and institutional setting of the Deutsche Bundesbank highlight the preponderant role that the hyperinflation of the 1920s played. For example, Clarida and Gertler (1997) argue that the hyperinflation of the 1920s was a key factor shaping the design of the central bank in

We further explore the link between credibility/anchoring and policy rates' response to deviations from target by interacting the expected inflation gap with two additional measures of credibility/anchoring. The first is a backward-looking metric, which gauges how close inflation has been to the target over the past eight quarters (two years). We implement this by calculating an eight-month rolling variance of the inflation gap, thus putting more weights to large deviations. The second is one of the components of the anchoring index proposed by Bems and others (2021).[9] In particular, we use the component that measures the responsiveness of medium-term expectations to short-term inflationary shocks—as an alternative measure of credibility of the central bank. The expectation is that when these dimensions lean towards low credibility/anchoring (there is higher deviation from target or a higher pass-through from short-term inflationary shocks to medium-term expectations) the policy rate will respond more forcefully to the expected inflation gap in order to keep inflation expectations close to the target, and vice versa. Consistent with our prior, results in Table 5, column 9 show that while the coefficient for the interaction between the inflation gap in *t* and the rolling variance of the inflation gap over the past two years is positive, it is not statistically significant. Similarly, column 10 shows that the interaction of the inflation with Bems and others (2021) measuring of anchoring is negative but not significant. To be sure, the anchoring index in column 10 is only available for a subset of countries and periods compared to our analysis in columns 1-8. Thus, in column 11 we re-estimate the specification in column 8 for the same sample as in column 10 and find that results hold. In sum, our results show that the relationship between the policy rate and either time as an IT or different metrics of credibility anchoring goes in the expected direction but is not statistically significant.

What lies behind the stronger response of EMDEs that adopted the IT regimes earlier and, more broadly the credibility puzzle? One plausible factor behind these findings is a past with high inflation levels. Many inflation targeting countries carry an inflationary past. After stabilizing prices through alternative means (be it exchange rate bands, pegs, crawling pegs, crawling bands, etc.), inflation targeting helped these countries manage their monetary policy in an effective manner (De Gregorio, 2024).

To study systematically the role played by past inflation in explaining differences in Taylor rules across countries, we extend our baseline specification by interacting the inflation and output gap coefficients with a dummy variable that takes value one if the country experienced high inflation in the past (see Section II for details). We find that countries that have an inflationary past exhibit larger (and statistically significant) policy rate responses to deviations in expected inflation relative to the target compared to countries that did not suffer high past inflation (Table 6). Countries with a high inflationary past change their interest rates by an additional 26 basis point—making the overall

the 1950s and how they conducted monetary policy in the following years. This supports our point that "inflationary memory" is persistent.

[9] The literature has developed indices of central bank credibility and anchoring (see Bems and others, 2021). One problem with these indices for the purpose of this paper is that anchoring is partly related to the deviation of inflation expectations relative to the target, i.e. the expected inflation gap. Thus, we pursue a simpler exercise which assumes that credibility and anchoring increase as time under an IT regime passes. This amounts to interacting the expected inflation and output gaps with the years the central bank has as an IT. As a robustness exercise, we also explore how the response of the policy rate to the inflation gap varies with one of the subcomponents of the index proposed by Bems and others (2021)—the responsiveness of long-term expectations to short-term inflationary shocks. This measure is less related to the expectations measure we use to construct our expected inflation gap.

effect close to 50 basis points in such countries, making it an economically significant effect.[10] Interestingly, we find no systematic evidence of differences in the response to the output gap. Further, note that the difference in the expected inflation gap coefficient is economically significant—the coefficient for countries with an inflationary past is more than double that of other countries. Note that this implies that, conditional on the credibility metric (as in Table 5), the average central banker in a country with high past inflation aims at keeping inflation expectations anchored, even if that implies a short-run economic activity cost in order to gain the longer-term benefits of preserving inflation expectations anchored.

Our result is not driven by our definition of the high past-inflation dummy, as the link finding that higher inflationary history results in a stronger response of the policy rate to deviations from the target is also found when we use the average past inflation in levels (Table 7). Columns 1-2 show results when we only interact the expected inflation gap with average past inflation, while in columns 3-4 we also interact average past inflation with the output gap. Results confirm our main findings—a higher value for average past inflation is linked to a higher coefficient for the expected inflation gap.

One possible channel through which past inflation affects the contemporaneous conduct of monetary policy is higher inflation persistence. This may arise, for example, when an inflationary past results in wage indexation tied to past inflation or to the nominal exchange rate relative to a hard currency. If this is the main channel through which past inflation affects monetary policy contemporaneously, we would expect the interaction between the expected inflation gap and inflation persistence to be positive and significant and the coefficient for the interaction between the expected inflation gap and the average past inflation level to be non-significant.

Table 7, column 5, shows that inflation persistence does not explain the higher policy rate response to deviations from target seen in countries with a history of past high inflation. We extend the specification in Table 7, column 4 by adding a gauge of inflation persistence and its interaction with the expected inflation gap.[11] The latter interaction is positive but not statistically significant, while the coefficient for the interaction of the expected inflation gap with the average past inflation remains positive and significant. Note that the sample in column 5 is smaller than the one in column 4, which raises the possibility that the findings in 5 are sample specific. Results in column 6 show that the link between past inflation and the coefficients of the Taylor rule documented in column 4 holds in the smaller sample used in column 5.

4.2. Discussion

Our results point to the importance of having a legacy of high inflation (we can also label it inflationary memory), which, all else equal, results in a stronger reaction of the central bank–a larger

[10] Unsustainable fiscal imbalances driven by fiscal dominance often contribute to inflationary processes, and typically translate into higher inflation expectations. The link between fiscal policy and inflation expectations is documented, for example, in David, Pienknagura, and Yépez, forthcoming, and Brandao-Marques and others, forthcoming. However, we do not control explicitly for fiscal dominance but for an index of legal central bank independence, in which central bank financing to the government is the most important criteria incorporated to that index. More generally, because there is consensus about the need of avoiding fiscal dominance when adopting an inflation targeting framework to strengthen its price stability commitment, countries have adhered to this fundamental principle.

[11] We construct a measure of inflation persistence as follows. For each country we estimate the elasticity of one-year ahead inflation expectation to contemporaneous inflation on a 20-quarter rolling basis. The estimated coefficient is then used as the gauge of persistence in the regressions in Table 7, column 5.

increase in interest rates in response to any movement in the inflation expectations' gap. What are possible explanations of these results? On the one hand, our results are related to the literature that analyzes the impact on inflation expectations of individuals based on their experience. For example, as in Magud and Pienknagura (2024), who show that for cross-country sample of emerging and advanced economies, individuals that have been exposed to longer spells of high inflations have stronger aversion to inflation. It also connects, on the policy side, to Melmendier (2021), who shows how policymakers in the US who were exposed to higher inflation when they were younger, tend to vote more hawkishly in FOMC meetings. This is also aligned with Rogoff (1985), as it is optimal to have a more inflation-conservative central banker to mitigate inflation. Probably, our findings are a combination of all such examples, as central banks internalize individuals' preferences (including a country's inflationary memory) into a successful monetary policy framework.

In turn, these findings challenge two important tenets of the received wisdom of inflation targeting. One is that the theoretical framework behind inflation targeting rests on assuming full credibility. However, full credibility is not supported precisely by the existence of the credibility puzzle. One could argue that longer data series could eventually result in the disappearance of the credibility puzzle. This may well be the case, which calls for a re-estimation of our results in the future. But, anecdotally, the German Bundesbank aversion to inflation as a consequence of Germany's hyperinflation in the 1920s—and the transfer of it thereafter to the European Central Bank—seems to suggest that the credibility puzzle may outweigh the passing of time, and that the strength of containment of inflation never dies away.

The other tenet is the assumption of no path dependence. The fact that the inflationary past plays such an important role in the interest rate reaction function of a central banks to current inflation gap shocks speaks to the importance of internalizing past events in models. Central banking in inflation targeting countries is clearly history-dependent, something that has typically been passed by in theoretical models of inflation targeting. So, even though IT works through anchoring expectations of future inflation, past inflation also matters for the effectiveness of monetary policy.

Yet, an inflationary past may relate to other variables that may affect the conduct of monetary policy. With this in mind, we explore the robustness of our results in the next section.

4.3. Robustness checks

This section explores the robustness of our main result—i.e., that countries that experienced high levels of inflation historically react more strongly to the expected inflation gap relative to those that did not. More broadly, it also tests alternative specifications for the Taylor rule.

Note that a history of high inflation may affect structural variables that are important for the effectiveness and conduct of monetary policy. For example, exposure to high inflation may undermine the development of domestic financial markets, especially those in domestic currency, and, relatedly, make countries less prone to have an open capital account as fears of depreciation may be present. Thus, we explore the extent to which our results are robust to the inclusion of some of the factors that are discussed in Annex II (financial development, central bank independence, capital account openness) which are important for the conduct of monetary policy and could be shaped by the legacy of an inflationary past.

Table 8 shows results for an extension of the regression in Table 6. More precisely, in addition to including the interactions of the expected inflation and output gaps, we control for interactions of each of the gaps with dummies capturing whether the country had a high level of the specific variable at the time of IT adoption—financial development, trade openness, capital account openness, and central bank independence. For example, the dummy for high financial development takes value 1 if the country had a value of the FD index which lied above the average value in our sample. A similar definition applies for other variables.

Results of this exercise confirm the relevance of a country's inflationary past even after controlling for additional country-specific characteristics (Table 8, columns 1). If anything, the difference between countries with past high inflation and those with no inflationary history in the response of the policy rate to deviations from the target of expected inflation becomes larger and remains statistically significant. Similar conclusions hold when we control for the different set of fixed effects described earlier (columns 2-4). Further, results are unaffected when we adjust the de jure measure of openness (from Chinn-Ito, KA openness) by the magnitude of interventions in foreign exchange markets (column 5)[12] or when we replace the high trade openness dummy with a dummy taking value one if the country is a commodity exporter (column 6).[13] The latter exercise takes into account the fact that these countries' economies are more susceptible to fluctuations in commodity prices.

Note also that many of these variables affect the response of policy rates to expected inflation gaps. In fact, having deeper financial markets or more independent central banks marginally reduce the reaction of policy interest rates to expected inflation gap shocks, as given by the negative interaction term of these variables and the expected inflation gap (Table 8). The same is true for integration to international financial markets (that is, the openness of the financial account), once we correct the de jure measure by taking into account FXI. Initial levels of trade openness do not appear to weigh on the parameters of the Taylor rule, as the coefficient of this interaction is not statistically significant.

Next, we modify the specification used in Table 8 by interacting the expected inflation and output gaps with the level of the country-specific variables of interest at the time of IT adoption. The results of this exercise, shown in Table 9, confirm the findings of Table 7—the coefficient for the interaction between the expected inflation gap and the average past inflation level is positive, statistically significant, and the magnitude of the coefficient is higher than those presented in Table 7. In contrast, and consistent with what was shown in Tables 7 and 8, the coefficient for the interaction of past inflation and the output gap is non-significant. Results are robust to the inclusion of time and year of IT adoption fixed effects and to the interaction of the gaps with a commodity exporter dummy.

Results in Table 9 are robust to the use of contemporaneous country-specific variables. Table 10 expands the specification in 9 by interacting the contemporaneous values of the key country-specific

[12] We correct the Chinn-Ito index by, first, computing the absolute value of FX interventions as a share of GDP and defining whether, in a given quarter, a country has high intervention, defined by the quarterly median value for our sample. Then we construct our adjusted measure of capital account openness as the average between the Chinn Ito index (which lies between 0 and 1) and one minus the FX intervention dummy. Intuitively, if the country has high de jure openness and low FX intervention, it will be featured as having high de facto openness.

[13] We use the definition of commodity exporters in Aslam and others (2016) for EMDEs. For AEs, we classify Australia, Canada, Norway, and New Zealand as commodity exporters.

characteristics we consider with each of the gaps and adding these variables as additional, self-standing, controls. Results of these alternative exercise confirm the results in Table 9; the coefficient for the interaction of the expected inflation gap and past inflation remains positive and statistically significant.

We turn to studying the robustness of our Taylor rule specification in Table 3 to different periods of analysis, samples, and specifications. In particular, we explore whether there are significant breaks over time (especially after 2020 and the COVID shock), robust to outliers, whether there is evidence of non-linearities or asymmetries, and whether estimated coefficients are robust to the inclusion of other controls (Table 11). First, one may wonder if the COVID shock affected these results.[14] To test for this, we add a dummy variable that takes the value of one for pre-COVID years. Columns (1) and (2) in Table 11 show that the baseline results are not affected. Also, given possible outlier data, we re-estimated the baseline model excluding Turkey and Russia, two countries where monetary policy has been recently affected by high inflation and political developments. Results in columns 3 and 4 show that the exclusion of these countries does not affect the findings in Table 3. Next, we check the robustness of results to the inclusion of years as IT linearly (as opposed of including fixed effects). Column 5 shows that this change does not affect the estimated coefficients for the expected inflation and output gaps. Column 6 presents results for an extended specification that allows the coefficient for the expected inflation gap to vary depending on the sign of the gap. In particular it adds an interaction between the expected inflation gap and a dummy taking value one if the gap is positive. Note that the coefficient for this additional variable is non-significant and small in magnitude, suggesting that there are non-significant asymmetries in the Taylor rule for the average country in our sample.

Importantly, we also check whether the inclusion of changes in commodity terms-of-trade (Table 11, column 7) or the ratio of the output gap and inflation volatilities (Table 11, column 8) affect our coefficients. The former variable takes into account the fact that commodity prices, and more broadly terms-of-trade, can pass-through to inflation, thus affecting our measures of the inflation gap and potentially shaping monetary policy. The latter aims at indirectly capturing the differences in the slope of the Phillips curve jointly with an IS curve, a dynamic that may affect monetary policy, given that, in principle, policy rates should only respond to demand shocks, but not supply shocks if inflation expectations are properly anchored. Results show that the inclusion of these variables does not affect the estimated coefficients of the Taylor rule. Next, column 9 assesses potential non-linearities. In particular, it includes both the expected inflation gap and its square value. Our results indicate no evidence of non-linearities, as the coefficient for the squared term is small and statistically insignificant.

Finally, Table 12 explores the role of regional shocks on monetary policy. The exercise takes into account the fact that there may be shocks (e.g., terms-of-trade shocks or natural disasters) that are not controlled in the regressions and may affect many countries in specific regions simultaneously or not (beyond global shocks). As was the case in Table 3 and Table 11, we present estimates that do not control for years as IT, include this variable linearly, and then as fixed effects. Results in Table 12 show that results remain broadly robust. The coefficients for the expected inflation and output gaps

[14] Guerra and others (2024) estimate Taylor rules for 5 IT countries in Latin America (Brazil, Chile, Colombia, Mexico and Peru) and document differences the estimated coefficients after COVID.

remain positive and significant, with the former being substantially larger in magnitude, albeit lower than in the baseline estimation.

5. Conclusions

Inflation targeting, a monetary policy regime that was adopted for the first time about 35 years ago, has become widespread among central banks in AEs and EMs, and is a central pillar in DSGE models. Despite many important similarities among IT central banks, this paper documents important differences in the conduct of monetary policy. Moreover, it shows that when it comes to explaining monetary policy heterogeneity, exposure to historical episodes of high inflation is a key determinant. After providing a theoretical model to account for the importance of path dependence and central bank credibility, our empirical findings show that, on average, central banks that adopted an IT framework respond preponderantly to deviations of inflation expectations from the target rate. However, for a given expected inflation gap, central banks in countries with a history of high inflation adjust their policy rate in a more aggressive way. Such response potentially explains the fact that the coefficient for the expected inflation in the Taylor rule does not appear to fall over time nor to be lower in central banks with greater inflation expectations' anchoring, a fact that we label the credibility puzzle. Thus, despite the persistent construction of credibility as they conduct their monetary policy over time, central banks, especially those with past high inflation experiences, continue to react as strong as in the past to inflation expectations shocks regardless—probably due to fears of the return of unanchored inflation.

While not formally tested in this paper, there are at least two potential explanations for our findings. First, it is possible that policy makers themselves, i.e. central bank board members, are scarred by their own experiences with high inflation and have a strong preference for price stability. Another possibility is that policy makers in countries with an inflationary memory internalize the impact that such history has on price and wage dynamics and thus need to respond more aggressively to deviations from target to break a potential inflationary spiral. Both these explanations would be consistent with recent evidence that shows that individuals that experienced past high inflation express a stronger preference for price stability (Magud and Pienknagura, 2024).

Regardless of the factors underlying our findings, the seeming persistence of inflationary memory and its impact on monetary policy has important implications both from a policy and economic modelling perspective. On the former, it raises the possibility that inflationary history may affect not only the conduct of monetary policy, but also the transmission of monetary policy. This, which is not explored in this paper, is an important avenue for future research.

From a modelling perspective, and this being the main contribution of the paper, it points to the importance of incorporating path dependency and less-than-perfect credibility in theoretical models, as these appear to be important empirical considerations, which have been missing in the standard inflation targeting model, with non-trivial implications.

Annex A. Tables

Table 1. Summary Statistics

	Average	St. Dev.	Min	Max
Policy rate	4.78	3.65	-0.5	26.5
NEER (change)	-0.53	7.96	-56.59	33.81
Inflation gap (observed)	0.59	2.87	-7.91	28.86
Inflation gap (expected)	0.26	1.01	3.79	11.58
Output gap	-0.003	2.33	32.35	10.38

Note: Summary statistics exclude data for Turkey

Table 2. Sample of Countries

Advanced Economies	Emerging Markets
AUS (1993), CAN (1992), CZE (1997), GBR (1992), ISR (1997), KOR (2001), NOR (2001), NZL (1990), SWE (1993)	ALB (2009), BRA (1999), CHL (1999), COL (1999), DOM (2012), GEO (2009), GTM (2005), HUN (2001), IDN (2005), IND (2015), KAZ (2015), MDA (2013), MEX (2001), PER (2003), PHL (2002), POL (1998), PRY (2013), ROU (2005), RUS (2015), SRB (2006), THA (2000), TUR (2006), ZAF (2000)

Note: Year of IT adoption in parenthesis

Table 3. Expected inflation vs. observed inflation.

VARIABLES	(1) Policy rate	(2) Policy rate	(3) Policy rate	(4) Policy rate	(5) Policy rate	(6) Policy rate	(7) Policy rate	(8) Policy rate	(9) Policy rate
Policy rate (t-1)	0.8692***	0.8960***	0.8723***	0.8518***	0.8866***	0.8627***	0.8678***	0.9084***	0.8719***
	(0.0345)	(0.0205)	(0.0323)	(0.0452)	(0.0278)	(0.0415)	(0.0463)	(0.0233)	(0.0410)
XR depreciation	-0.0220*	-0.0250*	-0.0196*	-0.0225*	-0.0262*	-0.0202*	-0.0323***	-0.0391***	-0.0294***
	(0.0124)	(0.0139)	(0.0110)	(0.0127)	(0.0144)	(0.0112)	(0.0123)	(0.0129)	(0.0110)
XR depreciation (t-1)	0.0243**	0.0219**	0.0203**	0.0251**	0.0228**	0.0210**	0.0251**	0.0241**	0.0205*
	(0.0099)	(0.0104)	(0.0100)	(0.0098)	(0.0103)	(0.0100)	(0.0101)	(0.0114)	(0.0104)
US Pol. rate (t-1)	0.0735***	0.0630***	0.0748***	0.0604***	0.0524***	0.0642***			
	(0.0278)	(0.0204)	(0.0269)	(0.0219)	(0.0184)	(0.0219)			
Output gap	0.0651***	0.0777***	0.0687***	0.0693***	0.0826***	0.0732***	0.0839***	0.0907***	0.0841***
	(0.0147)	(0.0214)	(0.0151)	(0.0165)	(0.0224)	(0.0158)	(0.0172)	(0.0243)	(0.0168)
Inflation gap (observed inf)	0.0926***			0.0998***			0.0773		
	(0.0320)			(0.0378)			(0.0514)		
Inflation gap (core inf)		0.0903**			0.0945*			0.0706	
		(0.0410)			(0.0483)			(0.0598)	
Inflation gap (expected inf)			0.2207***			0.2253***			0.1845*
			(0.0714)			(0.0782)			(0.0950)
Constant	0.4245***	0.3295***	0.4002***	0.3439	0.1885	0.2780	0.2299	-0.3500	-0.0095
	(0.1270)	(0.0801)	(0.1257)	(0.2950)	(0.3099)	(0.2904)	(0.4655)	(0.3990)	(0.3523)
Implied b/(1- r)	0.7085**	0.8689**	1.7281***	0.6732***	0.8333**	1.6406***	0.5849*	0.7708	1.4405**
	(0.2405)	(0.4026)	(0.5342)	(0.2056)	(0.3457)	(0.4755)	(0.32592)	0.5823	(0.6632)
Observations	2,612	2,366	2,617	2,612	2,366	2,617	2,612	2,366	2,617
Number of groups	32	28	32	32	28	32	32	28	32
Sample	All	All	All	All	All	All	All	All	All
Time FE	NO	NO	NO	NO	NO	NO	YES	YES	YES
Years as IT FE	NO	NO	NO	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.896	0.909	0.900	0.899	0.911	0.903	0.910	0.923	0.914

Driscoll-Kraay standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 4. Effects by income levels.

VARIABLES	(1) Policy rate	(2) Policy rate	(3) Policy rate	(4) Policy rate	(5) Policy rate	(6) Policy rate	(7) Policy rate	(8) Policy rate	(9) Policy rate
Policy rate (t-1)	0.8888***	0.8476***	0.8960***	0.8885***	0.8367***	0.8957***	0.9109***	0.8711***	0.8891***
	(0.0204)	(0.0590)	(0.0312)	(0.0234)	(0.0641)	(0.0411)	(0.0160)	(0.0512)	(0.0468)
XR depreciation	0.0164	-0.0064	-0.0734***	0.0178	-0.0050	-0.0764***	-0.0006	-0.0108	-0.0779***
	(0.0158)	(0.0113)	(0.0197)	(0.0158)	(0.0110)	(0.0203)	(0.0107)	(0.0134)	(0.0230)
XR depreciation (t-1)	-0.0064	0.0084	0.0653***	-0.0080	0.0100	0.0651**	-0.0042	0.0072	0.0620**
	(0.0110)	(0.0085)	(0.0242)	(0.0113)	(0.0081)	(0.0247)	(0.0079)	(0.0099)	(0.0270)
US Pol. rate (t-1)	0.0804***	0.0806	0.0648*	0.0754***	0.0531	0.0268			
	(0.0225)	(0.0511)	(0.0369)	(0.0215)	(0.0500)	(0.0445)			
Output gap	0.0375**	0.0851***	0.0602***	0.0365**	0.0854***	0.0635***	0.0192	0.0941***	0.0650***
	(0.0146)	(0.0265)	(0.0141)	(0.0177)	(0.0283)	(0.0133)	(0.0176)	(0.0284)	(0.0230)
Inflation gap (expected inf)	0.1823***	0.3993***	0.1834*	0.1640***	0.4117***	0.1753*	0.0413	0.3246***	0.1698
	(0.0465)	(0.0878)	(0.0929)	(0.0410)	(0.0901)	(0.0925)	(0.0559)	(0.0859)	(0.1136)
Constant	0.1239***	0.5627**	0.4581**	0.1596	-0.1946	0.5460	-0.2299	-0.4725	2.5723***
	(0.0472)	(0.2578)	(0.1771)	(0.2002)	(0.4463)	(0.4638)	(0.2004)	(0.5220)	(0.4786)
Observations	1,010	927	680	1,010	927	680	1,010	927	680
Number of groups	9	10	13	9	10	13	9	10	13
Sample	AEs	EMDE early adopters	EMDE late adopters	AEs	EMDE early adopters	EMDE late adopters	AEs	EMDE early adopters	EMDE late adopters
Time FE	NO	NO	NO	NO	NO	NO	YES	YES	YES
Years as IT FE	NO	NO	NO	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.960	0.916	0.849	0.961	0.925	0.859	0.976	0.949	0.875

Note: Driscoll-Kraay standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 5. The credibility puzzle

VARIABLES	(1) Policy rate	(2) Policy rate	(3) Policy rate	(4) Policy rate	(5) Policy rate	(6) Policy rate	(7) Policy rate	(8) Policy rate	(9) Policy rate	(10) Policy rate	(11) Policy rate
Policy rate (t-1)	0.8670***	0.8685***	0.8654***	0.8655***	0.8597***	0.8608***	0.8675***	0.8677***	0.8842***	0.8948***	0.8917***
	(0.0337)	(0.0334)	(0.0409)	(0.0408)	(0.0416)	(0.0413)	(0.0415)	(0.0414)	(0.0163)	(0.0244)	(0.0250)
XR depreciation	-0.0198*	-0.0198*	-0.0293***	-0.0294***	-0.0205*	-0.0205*	-0.0303***	-0.0304***	-0.0321***	-0.0183	-0.0185
	(0.0109)	(0.0110)	(0.0105)	(0.0105)	(0.0112)	(0.0113)	(0.0107)	(0.0107)	(0.0106)	(0.0127)	(0.0125)
XR depreciation (t-1)	0.0208**	0.0206**	0.0215**	0.0215**	0.0216**	0.0214**	0.0217**	0.0217**	0.0188*	0.0108	0.0103
	(0.0100)	(0.0101)	(0.0103)	(0.0104)	(0.0101)	(0.0102)	(0.0103)	(0.0103)	(0.0104)	(0.0113)	(0.0112)
US Pol. rate (t-1)	0.0781***	0.0750***			0.0682***	0.0639***					
	(0.0279)	(0.0275)			(0.0228)	(0.0224)					
Output gap	0.0686***	0.0941***	0.0798***	0.0995***	0.0726***	0.1030***	0.0838***	0.1044***	0.0819***	0.0877***	0.0877***
	(0.0151)	(0.0201)	(0.0163)	(0.0201)	(0.0152)	(0.0217)	(0.0167)	(0.0206)	(0.0194)	(0.0171)	(0.0286)
Inflation gap (expected inf)	0.3294***	0.3228***	0.3210***	0.3164***	0.3253***	0.3177***	0.2984***	0.2940***	0.2522***	0.3230***	0.4479***
	(0.1140)	(0.1123)	(0.1101)	(0.1096)	(0.1008)	(0.0986)	(0.1125)	(0.1119)	(0.0676)	(0.0768)	(0.1559)
Inflation gap (expected inf) x years as IT	-0.0066	-0.0062	-0.0084	-0.0081	-0.0062	-0.0057	-0.0072	-0.0069			-0.0136
	(0.0053)	(0.0053)	(0.0062)	(0.0062)	(0.0052)	(0.0052)	(0.0066)	(0.0065)			(0.0120)
Output gap x years as IT		-0.0018		-0.0017*		-0.0022*		-0.0018*			-0.0001
		(0.0012)		(0.0009)		(0.0013)		(0.0010)			(0.0021)
Variance of inflation gap over past 2 years (t-1)									-0.0105		
									(0.0069)		
Output gap x									-0.0021		
Variance of inflation gap over past 2 years (t-1)									(0.0017)		
Inflation gap x									0.0002		
Variance of inflation gap over past 2 years (t-1)									(0.0003)		
Sensitivity to medium-term expectations to short term shocks										0.0032	
										(0.0305)	
Output gap x										0.0050	
Sensitivity to medium-term expectations to short term shocks										(0.0111)	
Inflation gap x										-0.0548	
Sensitivity to medium-term expectations to short term shocks										(0.0680)	
Constant	0.4122***	0.4107***	0.4052	0.4548	0.2765	0.2894	-0.0081	0.0543	0.6259**	0.1957	0.2456
	(0.1292)	(0.1295)	(0.4158)	(0.4270)	(0.2836)	(0.2884)	(0.3478)	(0.3657)	(0.2961)	(0.3321)	(0.3552)
Observations	2,617	2,617	2,617	2,617	2,617	2,617	2,617	2,617	2,374	1,246	1,246
Number of groups	32	32	32	32	32	32	32	32	32	22	22
Sample	All	All	All	All	All	All	All	All	All	All	All
Time FE	NO	NO	YES	YES	NO	NO	YES	YES	YES	YES	YES
Yeas as IT FE	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.901	0.901	0.913	0.913	0.903	0.903	0.915	0.915	0.918	0.935	0.935

Note: Driscoll-Kraay standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 6. History matters.

VARIABLES	(1) Policy rate	(2) Policy rate	(3) Policy rate	(4) Policy rate
Policy rate (t-1)	0.8595***	0.8471***	0.8479***	0.8604***
	(0.0327)	(0.0410)	(0.0410)	(0.0418)
XR depreciation	-0.0203*	-0.0208*	-0.0207*	-0.0302***
	(0.0109)	(0.0111)	(0.0111)	(0.0107)
XR depreciation (t-1)	0.0202**	0.0209**	0.0208**	0.0213**
	(0.0097)	(0.0096)	(0.0096)	(0.0102)
US Pol. rate (t-1)	0.0893***	0.0801***	0.0799***	-0.1045
	(0.0269)	(0.0226)	(0.0227)	(0.0664)
Output gap	0.0676***	0.0722***	0.0638***	0.0739***
	(0.0154)	(0.0165)	(0.0146)	(0.0156)
Inflation gap (expected inf)	0.1951**	0.2006**	0.2007**	0.1677*
	(0.0819)	(0.0861)	(0.0858)	(0.1004)
Output gap x Pre-IT high inflation dummy			0.0264	0.0348
			(0.0215)	(0.0223)
Inf. gap x Pre-IT high inflation dummy	0.2601**	0.2694**	0.2672**	0.2412**
	(0.1178)	(0.1178)	(0.1176)	(0.1214)
Constant	0.4149***	0.3494	0.3451	0.8788***
	(0.1247)	(0.2761)	(0.2785)	(0.2941)
Observations	2,617	2,617	2,617	2,617
Number of groups	32	32	32	32
Sample	All	All	All	All
Time FE	NO	NO	NO	YES
Yeas as IT FE	NO	YES	YES	YES
Adjusted R-squared	0.902	0.905	0.905	0.916

Note: Regressions also include the lagged policy rate, changes in the NEER and its lag. For simplicity these coefficients are not shown. Driscoll-Kraay standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 7. History matters: Pre-IT inflation in levels and the role of inflation persistence

VARIABLES	(1) Policy rate	(2) Policy rate	(3) Policy rate	(4) Policy rate	(5) Policy rate	(6) Policy rate
Policy rate (t-1)	0.8641***	0.8499***	0.8507***	0.8620***	0.9027***	0.9108***
	(0.0322)	(0.0418)	(0.0418)	(0.0426)	(0.0287)	(0.0342)
XR depreciation	-0.0200*	-0.0205*	-0.0205*	-0.0290**	-0.0321**	-0.0325**
	(0.0109)	(0.0110)	(0.0110)	(0.0111)	(0.0158)	(0.0159)
XR depreciation (t-1)	0.0208**	0.0216**	0.0216**	0.0205*	0.0233	0.0233
	(0.0099)	(0.0098)	(0.0098)	(0.0105)	(0.0157)	(0.0160)
US Pol. rate (t-1)	0.0912***	0.0813***	0.0817***	-0.1208*	0.1554***	0.1619***
	(0.0290)	(0.0236)	(0.0237)	(0.0701)	(0.0450)	(0.0390)
Output gap	0.0698***	0.0747***	0.0621***	0.0693***	0.0672***	0.0651***
	(0.0166)	(0.0180)	(0.0165)	(0.0160)	(0.0229)	(0.0209)
Inflation gap (expected inf)	0.0600	0.0495	0.0505	0.0277	0.0003	0.0770
	(0.0842)	(0.0869)	(0.0869)	(0.1052)	(0.1339)	(0.0954)
Output gap x Pre-IT inflation			0.0405	0.0506	0.0429	0.0447
			(0.0271)	(0.0307)	(0.0315)	(0.0325)
Inf. gap x Pre-IT inflation	0.5890**	0.6544**	0.6497**	0.5887**	0.3296***	0.3105**
	(0.2402)	(0.2508)	(0.2496)	(0.2672)	(0.1179)	(0.1516)
Inf. gap x Persistence measure					0.1980	
					(0.2559)	
Persistence measure					-0.2036	
					(0.2331)	
Constant	0.4161***	0.3897	0.3804	0.9604***	-0.5049	-0.6696***
	(0.1262)	(0.3001)	(0.3010)	(0.3123)	(0.3346)	(0.2517)
Observations	2,513	2,513	2,513	2,513	1,872	1,872
Number of groups	31	31	31	31	30	30
Sample	All	All	All	All	All	All
Time FE	NO	NO	NO	YES	YES	YES
Yeas as IT FE	NO	YES	YES	YES	YES	YES
Adjusted R-squared	0.899	0.903	0.903	0.914	0.904	0.904

Note: Regressions also include the lagged policy rate, changes in the NEER and its lag. For simplicity these coefficients are not shown. Driscoll-Kraay standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 8. Financial depth, global integration, central bank independence, and net commodity exporter.

VARIABLES	(1) Policy rate	(2) Policy rate	(3) Policy rate	(4) Policy rate	(5) Policy rate	(6) Policy rate
Output gap	0.0979***	0.0964***	0.1104***	0.1112***	0.0739***	0.0956***
	(0.0288)	(0.0287)	(0.0303)	(0.0298)	(0.0137)	(0.0315)
Inflation gap (expected inf)	0.3498***	0.3443***	0.2823**	0.2833**	0.2875***	0.3689***
	(0.1031)	(0.1032)	(0.1163)	(0.1086)	(0.0572)	(0.1087)
Inf. gap x Pre-IT high inflation dummy	0.3189***	0.3517***	0.3192**	0.3433***	0.2838**	0.2039**
	(0.1114)	(0.1129)	(0.1226)	(0.1237)	(0.1130)	(0.0968)
Output gap x Pre-IT high inflation dummy	0.0465	0.0512	0.0545	0.0622	0.0140	0.0439
	(0.0381)	(0.0402)	(0.0388)	(0.0400)	(0.0310)	(0.0411)
Inf. gap x high initial FD dummy	-0.2598***	-0.2791***	-0.2353***	-0.2343***	-0.1677***	-0.2029***
	(0.0711)	(0.0772)	(0.0698)	(0.0731)	(0.0587)	(0.0765)
Output gap x high initial FD dummy	0.0125	0.0239	0.0065	0.0075	0.0028	0.0098
	(0.0171)	(0.0207)	(0.0165)	(0.0178)	(0.0178)	(0.0188)
Inf. gap x high initial KA dummy	-0.0545	-0.0333	-0.0705	-0.0287	-0.0949	
	(0.0929)	(0.0894)	(0.0819)	(0.0942)	(0.0858)	
Output gap x high initial KA dummy	-0.0726***	-0.0622***	-0.0769***	-0.0699***	-0.0755***	
	(0.0212)	(0.0168)	(0.0191)	(0.0171)	(0.0159)	
Inf. gap x high initial KA dummy (modified)						-0.3823**
						(0.1488)
Output gap x high initial KA dummy (modified)						-0.0146
						(0.0266)
Inf. gap x high initial trade openness dummy	0.0499	0.0618	0.0756	0.0705		0.0475
	(0.1225)	(0.1155)	(0.1106)	(0.1091)		(0.1006)
Output gap x high initial trade openness dummy	-0.0869**	-0.0884**	-0.0751*	-0.0764**		-0.0573
	(0.0431)	(0.0398)	(0.0401)	(0.0375)		(0.0350)
Inf. gap x commodity exporter dummy					0.1190	
					(0.1017)	
Output gap x commodity exporter dummy					0.0819**	
					(0.0351)	
Inf. gap x high initial CBI dummy	-0.1605*	-0.1509*	-0.1095	-0.1177	-0.1179	-0.1629**
	(0.0898)	(0.0861)	(0.0890)	(0.0882)	(0.0941)	(0.0789)
Output gap x high initial CBI dummy	-0.0033	-0.0036	-0.0073	-0.0096	0.0019	-0.0066
	(0.0271)	(0.0284)	(0.0279)	(0.0298)	(0.0280)	(0.0303)
Constant	0.4675***	0.4692	1.0859**	0.7410	0.7049	0.9742**
	(0.1451)	(0.2920)	(0.5268)	(0.4534)	(0.4589)	(0.3968)
Observations	2,375	2,375	2,375	2,375	2,375	2,171
Number of groups	29	29	29	29	29	29
Sample	All	All	All	All	All	All
Time FE	NO	NO	YES	YES	YES	YES
Yeas as IT FE	NO	YES	NO	YES	YES	YES
Adjusted R-squared	0.896	0.900	0.909	0.912	0.912	0.917

Note: Regressions also include the lagged policy rate, changes in the NEER and its lag. For simplicity these coefficients are not shown. Driscoll-Kraay standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 9. Actual inflation (rather than high inflation dummy) and net commodity exporters.

VARIABLES	(1) Policy rate	(2) Policy rate	(3) Policy rate	(4) Policy rate
Output gap	0.0503***	0.0694***	0.0365***	0.0581***
	(0.0145)	(0.0210)	(0.0126)	(0.0182)
Inflation gap (expected inf)	-0.1698	-0.1796	-0.0912	-0.1105
	(0.1959)	(0.2088)	(0.1685)	(0.1843)
Inf. gap x Pre-IT inflation	0.9993***	0.9199***	0.7753***	0.7281***
	(0.3408)	(0.3515)	(0.2572)	(0.2730)
Output gap x Pre-IT inflation	0.0217	0.0248	0.0072	0.0131
	(0.0336)	(0.0337)	(0.0252)	(0.0253)
Inf. gap x FD index (initial)	-0.9502*	-0.8942*	-0.7494	-0.7242
	(0.5393)	(0.5022)	(0.4811)	(0.4628)
Output gap x FD index (initial)	0.3642***	0.3226**	0.2455**	0.1909*
	(0.1242)	(0.1252)	(0.1055)	(0.0990)
Inf. gap x KA index (initial)	0.5651**	0.5267**	0.5535	0.5253
	(0.2582)	(0.2375)	(0.3578)	(0.3301)
Output gap x KA index (initial)	-0.1618***	-0.1512***	-0.1846***	-0.1682***
	(0.0581)	(0.0565)	(0.0621)	(0.0593)
Inf. gap x trade openness (initial)	0.0039	0.0034		
	(0.0047)	(0.0047)		
Output gap x trade openness (initial)	-0.0025***	-0.0025***		
	(0.0008)	(0.0009)		
Inf. gap x commodity exporter dummy			0.1621*	0.1439
			(0.0899)	(0.0932)
Output gap x commodity exporter dummy			0.0478	0.0425
			(0.0344)	(0.0358)
Inf. gap x CBIE index (initial)	1.0326***	1.0590***	1.0217**	1.0405***
	(0.3699)	(0.3737)	(0.4013)	(0.3837)
Output gap x CBIE index (initial)	0.2700**	0.2371**	0.1226	0.1011
	(0.1132)	(0.1037)	(0.0846)	(0.0860)
Constant	0.4408	0.2728	0.4213	0.3522
	(0.2906)	(0.3919)	(0.2842)	(0.3975)
Observations	2,513	2,513	2,513	2,513
Number of groups	31	31	31	31
Sample	All	All	All	All
Time FE	NO	YES	NO	YES
Yeas as IT FE	YES	YES	YES	YES
Adjusted R-squared	0.906	0.916	0.906	0.916

Note: Regressions also include the lagged policy rate, changes in the NEER and its lag. For simplicity these coefficients are not shown. Driscoll-Kraay standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 10. Contemporaneous state variables.

VARIABLES	(1) Policy rate	(2) Policy rate	(3) Policy rate	(4) Policy rate
Output gap	0.0667	0.0751	0.0402	0.0522
	(0.0583)	(0.0557)	(0.0518)	(0.0527)
Inflation gap (expected inf)	0.4499**	0.5904***	0.4451**	0.5593***
	(0.1927)	(0.2020)	(0.1873)	(0.1864)
Inf. gap x Pre-IT inflation	0.9726***	0.8819**	0.8766***	0.7889**
	(0.3291)	(0.3631)	(0.3173)	(0.3531)
Output gap x Pre-IT inflation	0.0343	0.0425*	-0.0023	0.0085
	(0.0275)	(0.0252)	(0.0362)	(0.0305)
Inf. gap x FD index	-0.4366*	-0.6144**	-0.3999	-0.5695**
	(0.2420)	(0.2356)	(0.2558)	(0.2463)
Output gap x FD index	0.0642	0.0478	0.0646	0.0486
	(0.0560)	(0.0558)	(0.0561)	(0.0553)
Inf. gap x KA index	0.0692	0.0370	0.0348	-0.0044
	(0.1449)	(0.1572)	(0.1468)	(0.1576)
Output gap x KA index	-0.0654**	-0.0707**	-0.0896***	-0.0935***
	(0.0286)	(0.0286)	(0.0274)	(0.0297)
Inf. gap x trade over GDP	0.0004	0.0001		
	(0.0011)	(0.0013)		
Output gap x trade over GDP	-0.0004	-0.0004		
	(0.0004)	(0.0005)		
Inf. gap x commodity exporter dummy			0.0705	0.0842
			(0.0829)	(0.0847)
Output gap x commodity exporter dummy			0.0494*	0.0466*
			(0.0261)	(0.0247)
Inf. gap x CBIE index	-0.3184	-0.3930	-0.2679	-0.3376
	(0.2338)	(0.2498)	(0.2323)	(0.2435)
Output gap x CBIE index	0.0347	0.0474	0.0474	0.0559
	(0.0668)	(0.0667)	(0.0659)	(0.0673)
Constant	0.2866	0.2847	0.2829	0.8124
	(0.4507)	(0.6716)	(0.4506)	(0.7140)
Observations	2,059	2,059	2,059	2,059
Number of groups	28	28	28	28
Sample	All	All	All	All
Time FE	NO	YES	NO	YES
Yeas as IT FE	YES	YES	YES	YES
Adjusted R-squared	0.920	0.931	0.920	0.931

Note: Regressions also include the lagged policy rate, changes in the NEER and its lag, and the contemporaneous values for each of the country-specific variables we interact with the gaps (the financial development index, trade openness, the central bank independence index, and the capital account openness index). For simplicity these coefficients are not shown. Driscoll-Kraay standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 11. The effects of the COVID shock, outliers, inflation gap direction, terms-of-trade and non-linearities.

VARIABLES	(1) Policy rate	(2) Policy rate	(3) Policy rate	(4) Policy rate	(5) Policy rate	(6) Policy rate	(7) Policy rate	(8) Policy rate	(9) Policy rate
Policy rate (t-1)	0.8139***	0.8310***	0.8793***	0.8556***	0.8701***	0.8719***	0.8964***	0.9034***	0.8720***
	(0.0480)	(0.0509)	(0.0436)	(0.0443)	(0.0406)	(0.0410)	(0.0167)	(0.0229)	(0.0422)
XR depreciation	-0.0128	-0.0209**	-0.0217**	-0.0201**	-0.0282**	-0.0294***	-0.0197**	-0.0322***	-0.0294***
	(0.0102)	(0.0093)	(0.0103)	(0.0100)	(0.0108)	(0.0110)	(0.0093)	(0.0119)	(0.0110)
XR depreciation (t-1)	0.0100	0.0108	0.0149	0.0100	0.0203*	0.0206*	0.0031	0.0179*	0.0205*
	(0.0068)	(0.0072)	(0.0098)	(0.0078)	(0.0105)	(0.0105)	(0.0071)	(0.0104)	(0.0104)
US Pol. rate (t-1)	0.0343								
	(0.0255)								
Output gap	0.1187***	0.1049***	0.0766***	0.0697***	0.0796***	0.0841***	0.0912***	0.0808***	0.0841***
	(0.0254)	(0.0232)	(0.0154)	(0.0184)	(0.0161)	(0.0167)	(0.0211)	(0.0165)	(0.0167)
Inflation gap (expected inf)	0.3314***	0.3010***	0.1857*	0.2675***	0.1882*	0.1932**	0.2417***	0.1047	0.1832**
	(0.0777)	(0.0891)	(0.0969)	(0.0604)	(0.0973)	(0.0887)	(0.0456)	(0.0792)	(0.0737)
Years as IT					0.0054				
					(0.0124)				
Inflation gap x 1(Inflation gap>0)						-0.0092			
						(0.1211)			
Change in commodity terms-of-trade (t-1)							0.0640***		
							(0.0237)		
ratio of inflation to output gap volatilities								0.0572*	
								(0.0298)	
Inflation gap squared (expected inf)									0.0000
									(0.0038)
Constant	0.8888***	0.7159	-0.0569	0.0600	0.7391*	-0.0066	0.0492	1.0723***	-0.0110
	(0.2908)	(0.4685)	(0.3693)	(0.3415)	(0.4419)	(0.3502)	(0.3960)	(0.3345)	(0.3603)
Observations	2,117	2,117	2,583	2,546	2,617	2,617	1,944	2,286	2,617
Number of groups	32	32	31	31	32	32	31	32	32
Sample	Pre-2020	Pre-2020	Exc. Russia	Exc. Turkey	All	All	All	All	All
Time FE	NO	YES	YES	YES	YES	YES	YES	YES	YES
Years as IT FE	YES	YES	YES	YES	NO	YES	YES	YES	YES
Adjusted R-squared	0.920	0.929	0.923	0.930	0.912	0.914	0.946	0.921	0.914

Note: Driscoll-Kraay standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 12. Region-specific time-varying shocks.

VARIABLES	(1) Policy rate	(2) Policy rate	(3) Policy rate
Policy rate (t-1)	0.8739***	0.8739***	0.8771***
	(0.0382)	(0.0382)	(0.0383)
XR depreciation	-0.0254**	-0.0254**	-0.0268**
	(0.0120)	(0.0120)	(0.0121)
XR depreciation (t-1)	0.0169	0.0169	0.0169
	(0.0123)	(0.0123)	(0.0120)
Output gap	0.0566***	0.0566***	0.0637***
	(0.0156)	(0.0156)	(0.0157)
Inflation gap (expected inf)	0.1686*	0.1686*	0.1633*
	(0.0998)	(0.0998)	(0.0971)
Years as IT		0.0031	
		(0.0094)	
Constant	0.7352**	0.6908**	-0.2392
	(0.2963)	(0.2812)	(0.3704)
Observations	2,617	2,617	2,617
Number of groups	32	32	32
Sample	All	All	All
Region-time FE	YES	YES	YES
Years as IT FE	NO	NO	YES
Adjusted R-squared	0.932	0.932	0.933

Note: Driscoll-Kraay standard errors in parentheses.

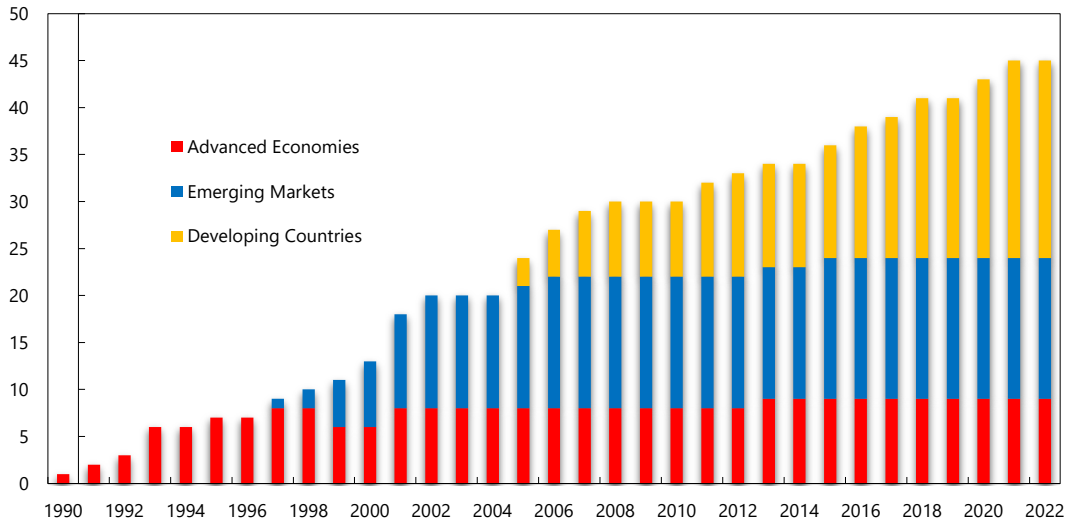
*** p<0.01, ** p<0.05, * p<0.1

Annex B. The Heterogeneity of Inflation Targeting Countries: Some Stylized Facts

B.1. Inflation targeting as a tool to conduct monetary policy

It has been 35 years since New Zealand adopted inflation targeting as a new monetary policy regime.[15] Since then, inflation targeting has lured monetary policymakers and has become the predominant approach to monetary policy formulation among AEs and EMs. Inflation targeting has spread across regions and has spanned different levels of development, reaching 45 countries as of end-2023.[16] Advanced economies implemented initially this monetary policy regime in the 1990s and emerging markets followed suit in the late 1990s. Over the last years, newcomers have been mostly developing countries (Figure A2.1).[17] The popularity of inflation targeting is only expected to grow as inflation targeting is considered today the most effective monetary policy regime to anchor inflation expectations, and because the strength of the regime was successfully tested both during the GFC and in the aftermath of the COVID shock.

Figure A2.1. The increasing Popularity of Inflation Targeting
(Number of countries, 1990-2022)



Source: Source: IMF Annual Reports on Exchange Arrangements and Exchange Restrictions.
Note: The classification of emerging markets is from Morgan Stanley's Emerging Market Index (MSCI).

In many cases, IT was adopted when countries abandoned the use of exchange rate pegs and, instead, introduced exchange rate flexibility. As monetary aggregates lost relevance when inflation

[15] New Zealand approved legislation to support inflation targeting in late 1989 and started implementing it in early 1990 with the view of ending two decades of inflation in which the central bank had failed to rein in rapid price increases—between 10 and 15 percent y-o-y.
[16] This number does not include the U.S. Federal Reserve, which is arguably an inflation targeting as well, nor countries whose monetary policy is under the aegis of the European Central Bank, which follows an inflation targeting framework.
[17] All Figures and Tables are shown in Annex I.

declined to or reached near single-digit rates, central banks had to find an alternative nominal anchor. Inflation targeting was chosen, as it has the capacity to work as a coordinating mechanism for inflation expectations and guide them to the central bank's inflation target, provided the central bank enjoys some degree of credibility.[18] Emerging markets had an additional reason to adopt inflation targeting because this policy regime proved to be flexible enough to withstand recurrent real and financial shocks, while still maintaining relatively low inflation—assuming fiscal policy was kept in check.

Inflation targeting thus became more than a policy strategy as it provided central banks with a comprehensive and consistent policy framework. To succeed, it required to constantly upgrade central banks' technical capacity, the generation of data, and conduct analytical research on a regular basis, all of which would enrich the analysis of monetary policy decisions, in particular the adjustments of the policy rate. Inflation targeting also facilitated accountability and regular communication. By adopting inflation targeting, central banks could be held accountable with respect to a measurable target, which is easy to monitor and assess for the public at large, a necessary institutional practice given that inflation-targeting central banks are politically independent institutions. Inflation targeting implementation also strengthened accountability because it required central banks to disclose and explain policy decisions, which tends to boost the effectiveness of monetary policy to the extent that market participants understand central bank decisions.

During the first 20 years of inflation targeting, when inflation worldwide declined, central banks that adopted this policy regime behaved in a similar fashion. However, as the price of commodities swelled globally in the early 2000s and when the GFC hit in 2008, the previous uniform trend was broken. Many emerging markets' central banks reacted by swiftly raising interest rates to cope with soaring inflation, well before than in advanced economies, to then reversing this trend soon after Lehman's collapse. Because the epicenter of the GFC was in major advanced economies, their central banks reacted more aggressively, slashing interest rates down to the effective-lower-bound. Moreover, they implemented various unconventional monetary measures to cope with persistent low inflation and financial instability—in contrast to the emerging markets that introduced timidly these measures—and in the following years as countries reacted slowly to this shock. Later, in the aftermath of the Covid pandemic, and due to the impact of other supply shocks, as inflation surged to levels not seen in decades across the world, inflation targeting central banks reacted once again in the same direction, forcefully tightening monetary policy.

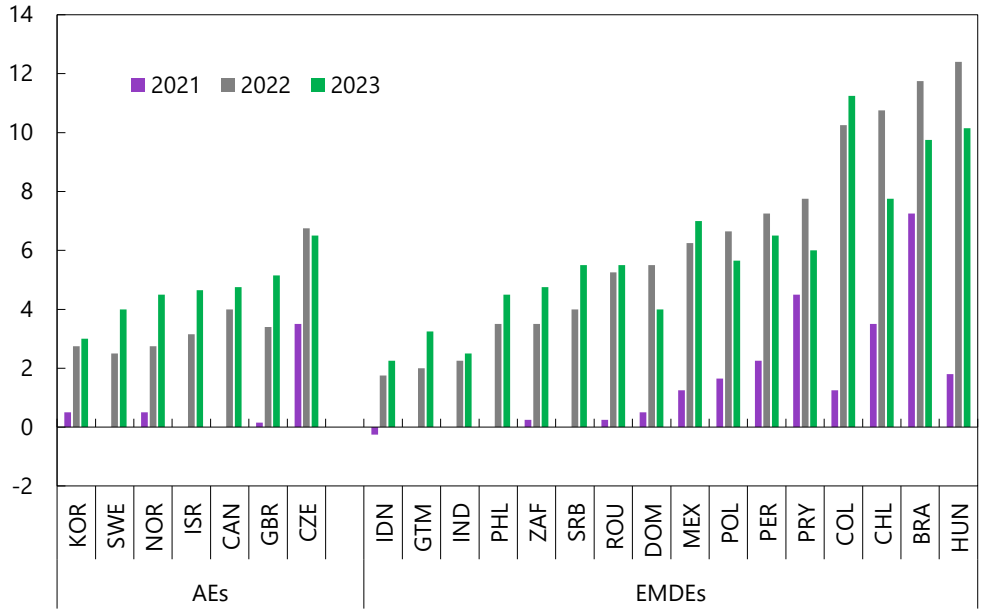
Yet central banks' policy response to the recent bout of inflation was not the same in all countries, as the timing and strength of monetary policy responses varied across inflation-targeting central banks. From a regional perspective, inflation-targeting central banks in Latin America reacted sooner and stronger, adjusting the policy rate, while the pace of tightening was the softest in Asia (Figure 2). And although inflation experienced similar trajectories across regions—it surged more in Latin America—, real policy rates exhibited similar patterns.

[18] During the transition to lower inflation rates, and prior to the formal adoption of IT frameworks, many central banks already had set a target for inflation, as part of their disinflation efforts. However, they were not considered inflation targeters because those central banks kept using mostly an exchange rate crawl as anchor to guide inflation expectations, which is the reason why the IMF AREAER—the source we use to identify inflation targeting countries—did not classified them as inflation targeters.

Figure A2.2. Monetary Policy Response During the COVID shock

Panel A. Change in nominal rates among ITs

Relative to Dec. 2020 (in percentage points)



Panel B. Change in real rates among ITs

Relative to Dec. 2020 (in percentage points)



Source: Data on policy rates are from the BIS.

Note: Changes in nominal and real rates are calculated from December 2020 to December of each month. Real rates are ex-post real rates.

B.2. IT countries' heterogeneity

A cross-section perspective of inflation-targeting countries provides insights about how country-specific factors may shape their monetary policy diversity. First and foremost, in addition to different levels of development, some countries have a history of high inflation. Inflation targeting countries also feature distinct structural characteristics, which can potentially affect central banks' reaction function and their policy results. We highlight below key differences in our sample of inflation-targeting countries.

B.2.1. The legacy of high inflation

A critical feature that makes inflation targeting countries a heterogenous group is that they have different inflation backgrounds. While most advanced economies had an inflation of less than 10 percent on average in the 30 years before they adopted inflation targeting, most emerging market economies and developing countries endured moderate inflation and, in some cases, three-digit rates of inflation (Figure A2.3) and even hyperinflation.[19] Under moderate inflation, contracts in the economy—in particular wage negotiations—tend to be indexed backwards, thus generating inflation inertia, which becomes a drag for anti-inflation efforts. This is particularly problematic for inflation targeting, whose effectiveness hinges on forward looking expectations of inflation. In countries that experienced three-digit inflation rates or hyperinflation, market participants still tended to focus on exchange rate developments because there was no trust on the central bank and its capacity to keep inflation in check.

Against this backdrop, central banks in emerging markets and developing countries had to initially turn backward-looking into forward-looking expectations aligned with central banks inflation targets. However, the legacy of high inflation is still likely to condition central banks' reaction function, as they need to show at all times an unequivocal commitment with their inflation objective. Thus, these central banks may be less tolerant to deviations from the target. In contrast, central banks in advanced economies with no recent legacy of high inflation can behave more clearly as flexible inflation targeters, aiming not only at preserving price stability, but also to stabilizing output performance and securing financial stability. We test this formally in Section III.

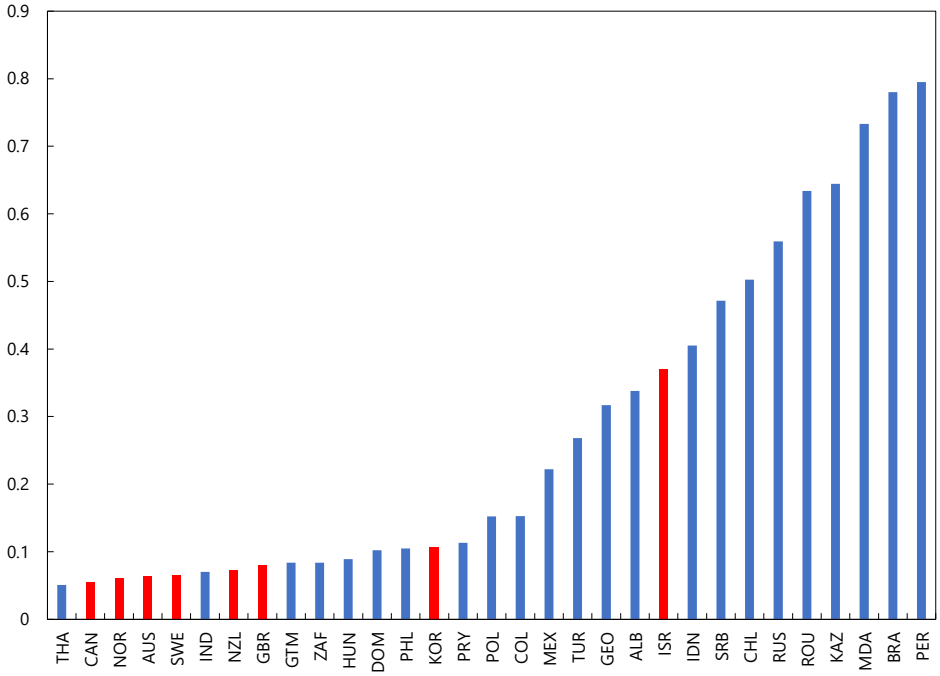
The legacy of chronic inflation also makes inflation targeters in emerging markets and developing countries more prone to financial dollarization. In these countries, economic agents choose to hold foreign currency as a way of protecting their savings from persistent domestic inflation. While financial dollarization is still high in several emerging markets and developing countries (Figure A2.4), it has decreased over time, although it has not disappeared, even after having conquered price stability. To be sure, some advanced economies also exhibit relatively large levels of financial dollarization (e.g., the UK and Canada), partly reflecting strong trade and financial ties with large countries or economic blocs. Yet, contrary to EMDEs, these countries have deep and sophisticated financial markets that allow for currency hedging. Indeed, financial dollarization can affect EMDE central banks' reaction function because of a fear of depreciation that may destabilize the financial system.[20] This may lead countries to introduce capital controls and/or intervene in the foreign

[19] The definition of moderate inflation varies in the literature. It refers to an increase in prices in the range of 10 to 40 percent per year (see Dornbusch and Fischer, 1994, and Frankel, 2011).

[20] Central banks fear that even if financial institutions' foreign exchange open position is well regulated, they are exposed to currency-induced credit risk, which is more difficult to control.

exchange market in order to keep the exchange rate stable, and even to introduce into its policy reaction function the goal of keeping the exchange rate stable with a view of preserving financial stability.

Figure A2.3. Average Inflation prior to IT adoption



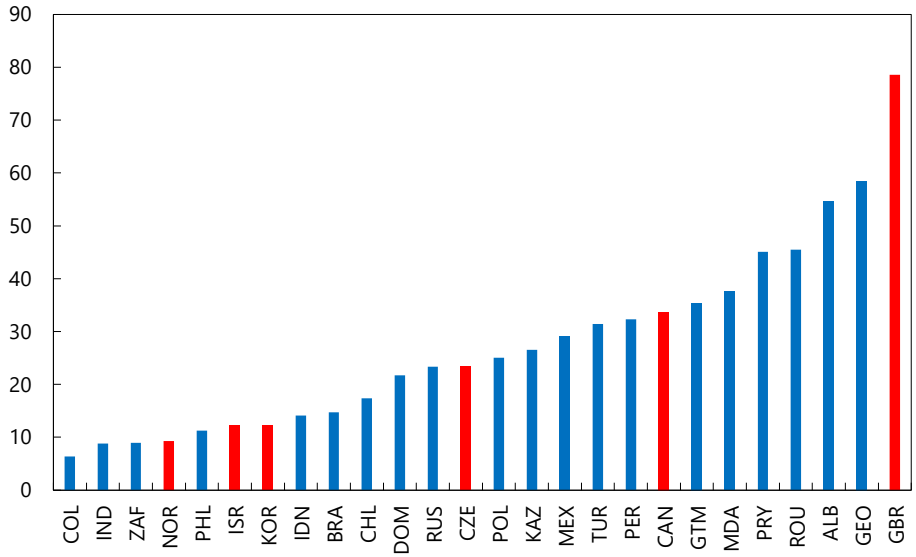
Source: World Development Indicators

Note: Average inflation is calculated from 1960 or the latest available year until ten years prior to the adoption of the IT regime. Average inflation is then transformed as in Jácome and Pienknagura (forthcoming); transformed inflation=inflation/(100+inflation). Blue bars are emerging markets and developing economies, red bars are advanced economies.

B.2.2. Financial development and capital account openness

Advanced economies benefit from developed financial systems compared to emerging market economies (Figure A2.5). Deep financial markets make the transmission of monetary policy more effective as changes in the central bank's policy rate have a strong effect on long-run interest rates in the financial system, thus having a greater impact on consumption and investment and, hence, on inflation and output. In contrast, shallow financial markets tend to impair the transmission mechanism of monetary policy, thus weakening its impact on inflation.

Figure A2. 4. Average Financial Dollarization, 2010-2023
(FX loans as percent of total loans)

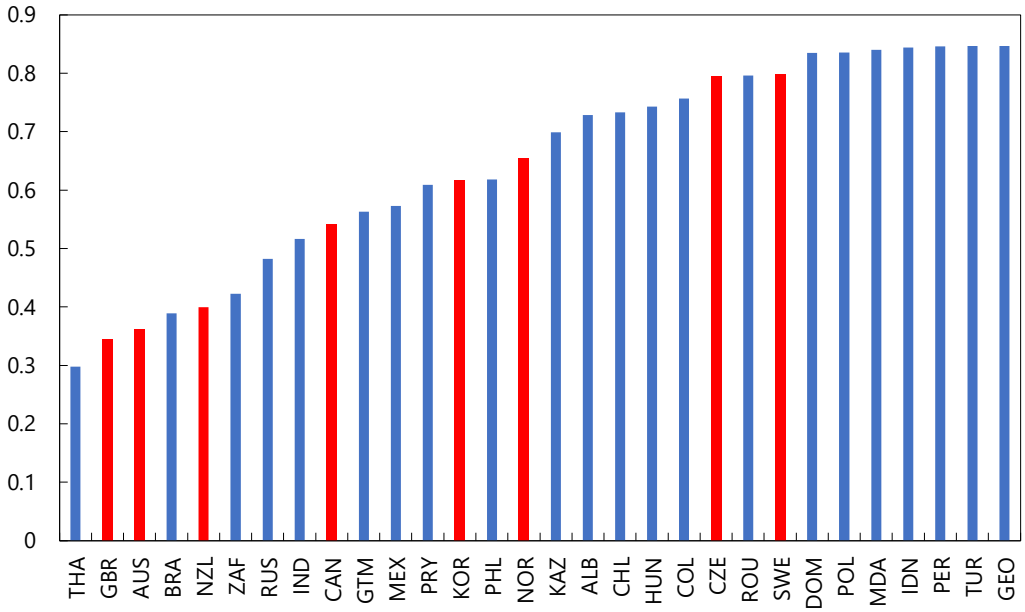


Source: IMF Financial Soundness Indicators.
Note: Blue bars are emerging markets and developing economies, red bars are advanced economies.

Advanced economies also enjoy fully open capital accounts (Figure A2.6). While cross-border capital flows could, in principle, create exchange rate volatility, its impact is attenuated when financial systems are well developed and, thus, a well-functioning market of derivatives is in place that allows market participants to hedge against large foreign currency volatility. To the extent that emerging market economies do not have a deep market of derivatives, large changes in capital inflows and outflows induce foreign exchange volatility and, depending on the central bank credibility, large exchange rate depreciations can have an adverse effect on inflation.

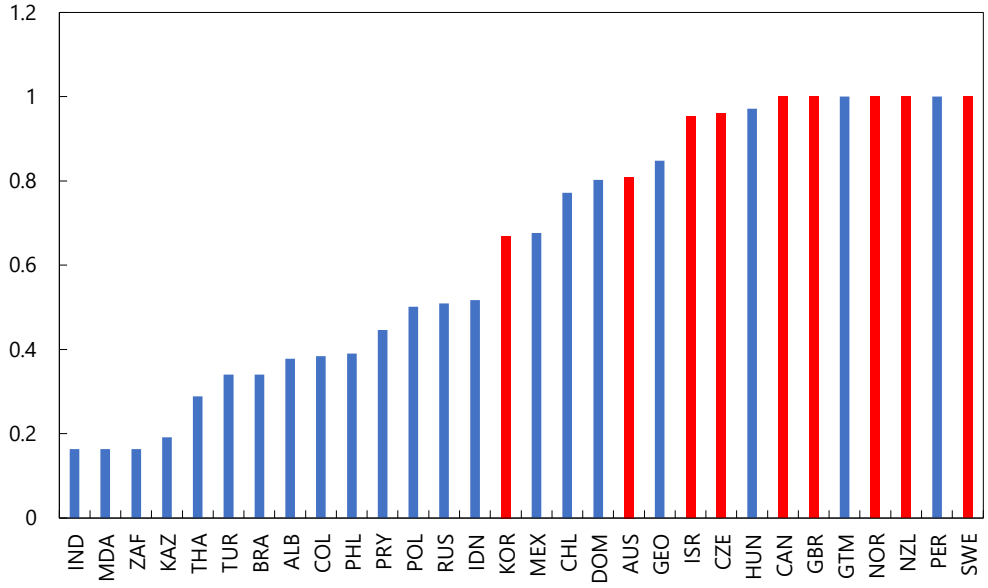
In addition, an important characteristic of emerging markets and developing countries with IT regimes is that several of them are large net commodity exporters, for example those in South America. Being a net commodity exporter may condition monetary policy decisions because recurrent terms of trade shocks have an impact on output, the exchange rate and, sometimes inflation—although the latter hinges on the exchange rate pass-through that, in turn, depends on the credibility of the central bank (Carrière and others, 2021)—, especially if the shock is of considerable scale and duration. Thus, the need for inflation targeting countries to have flexible exchange rate regimes. Moreover, central banks in commodity exporting countries could even face non-trivial policy trade-offs when confronting simultaneously an adverse terms of trade shock and tightening monetary conditions in the U.S. The former inflicts a negative effect on output and, hence, suggests loosening monetary policy, whereas the latter advice implementing a tightening stance to tackle capital outflows and exchange rate depreciation, which may have an impact on inflation expectations.

Figure A2.5. Financial Development, 2000-2021 average



Source: Sahay and other (2015)
Note: Blue bars are emerging markets and developing economies, red bars are advanced economies.

Figure A2.6: Financial Account Openness, 2000-2021 average



Source: Chinn and Ito (2006)
Note: Blue bars are emerging markets and developing economies, red bars are advanced economies.

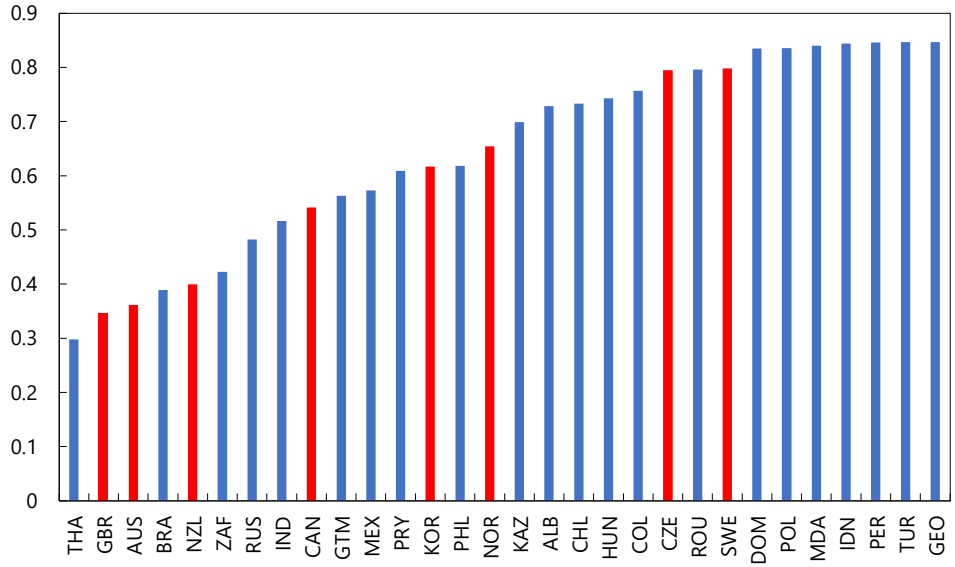
B.2.3. Central bank independence and transparency

Central bank independence and transparency are fundamental pillars of inflation targeting. Yet central bank independence and transparency vary across countries (Figure A2.7). Specifically, central banks in emerging markets are more independent but less transparent than in advanced economies. Central banks are probably more independent because of their previous history of high inflation, which was often associated to the governments' use of central banks to finance their coffers and to serve their short-term political agenda, in particular during electoral cycles. Thus, when instituting inflation targeting regimes in emerging markets, governments conferred stronger independence to central banks to support their credibility. Several central banks enjoy not only instrument independence, but also goal independence—like in Chile, Mexico, Peru, and Thailand, among others—which involves delegating the central bank to set the inflation target.[21] The advanced economies, in turn, perform better when it comes to transparency. Although central banks across the world have improved transparency (see Dincer and Eichengreen, 2014, and Dincer and others, 2022), central banks in advanced economies have made more progress, with the aim of strengthening accountability. There are at least two reasons behind the strengthening of central bank transparency. First, in the advanced economies, accountability requirements are on average particularly strong and, thus, central banks' transparency becomes a way of being accountable. Second, communication, which is an intrinsic element of transparency, is nowadays a powerful monetary policy tool used by central banks, especially in advanced economies, which is very effective in guiding and coordinating inflation expectations.

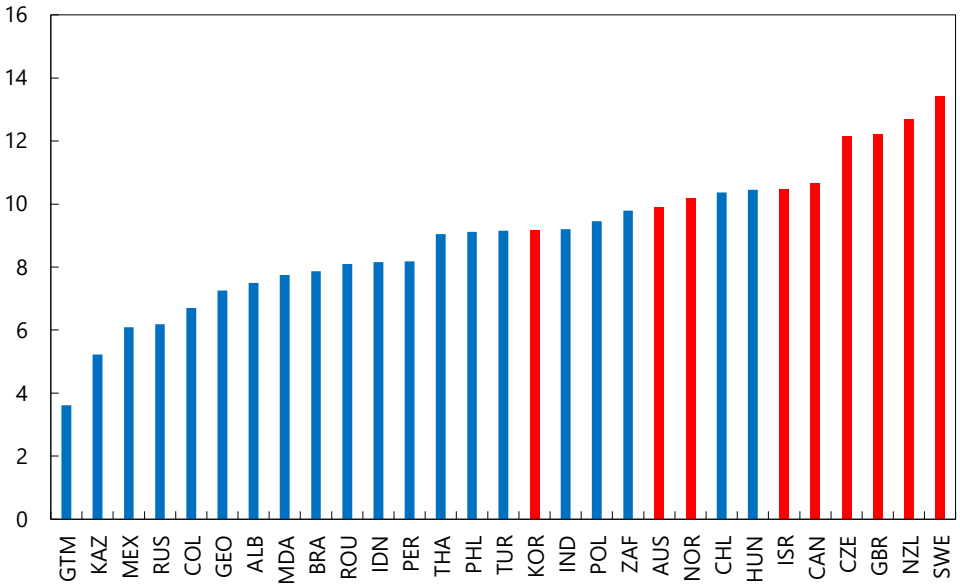
[21] This distinction was originally proposed by Debelle and Fischer (1994) and Fischer (1995), with the view of characterizing how independent central banks are.

Figure A2.7. Central Bank Independence and Transparency

Panel A. Central Bank Independence, 2000-2021 average



Panel B. Central Bank Transparency, 2000-2019 average



Source: Romelli (2022) and Dincer and Eichengreen (2022).

Note: Blue bars are emerging markets and developing economies, red bars are advanced economies.

Annex C. The Heterogeneity of Inflation Targeting Countries: Some Stylized Facts

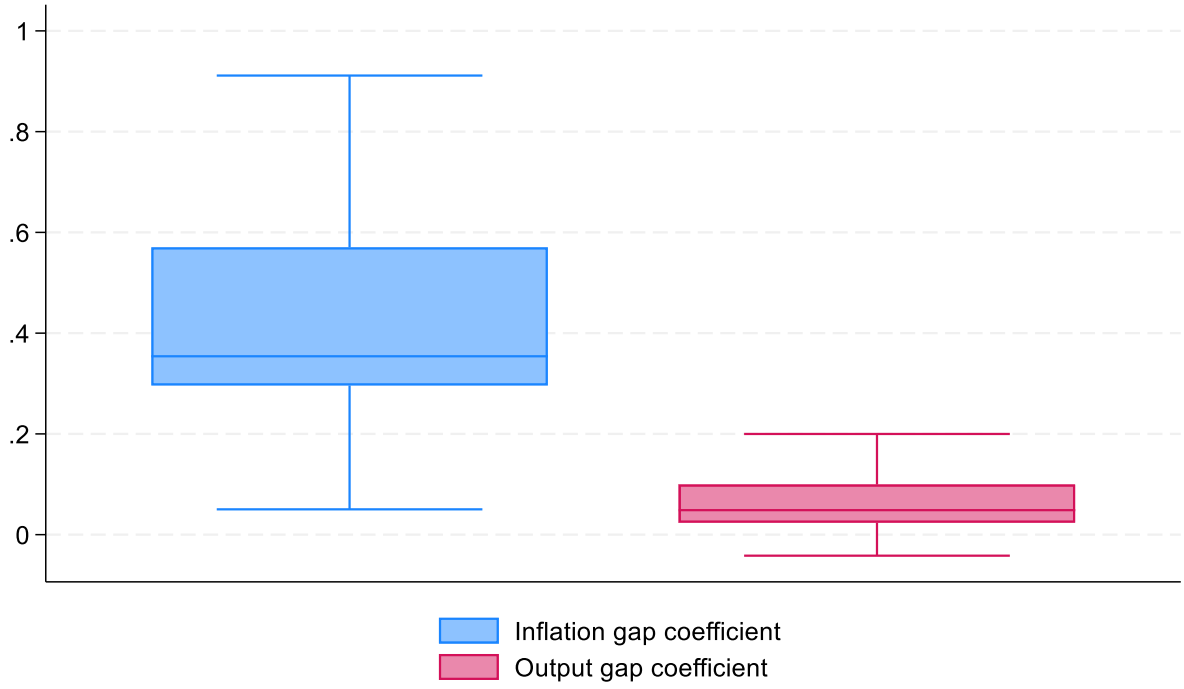
To further explore the relationship between a central bank's monetary policy reaction function (Taylor rule) and country-specific variables and past inflationary history, this Annex presents results from country-by-country regressions. In particular, we estimate the following Taylor rule for each IT country in our analysis:

$$i_{c,t} = \alpha_c + \rho_c i_{c,t-1} + \beta_c inf.gap_{c,t} + \gamma_c Y\ gap_{c,t} + \theta_c \Delta NEER_{c,t} + \mu_c \Delta NEER_{c,t-1} + \varphi_c i._{US,t-1} + \varepsilon_{c,t} \quad (A1)$$

As in the main text, $i_{c,t}$ is the policy rate in country *c,* at time *t,* $Y\ gap_{c,t}$ is the output gap in country *c* at time *t,* with output detrend through the HP filter, $\Delta NEER_{c,t}$ is the change in the nominal effective exchange rate in period *t,* $i._{US,t-1}$ is the monetary policy rate in the US at time *t-1*, and $inf.gap_{c,t}$ is the inflation gap in country *c* at time *t.* For simplicity, we focus on the results using the inflation gap constructed using inflation expectations.

Figure A1 plots the distribution of all the coefficients β_c and γ_c. Note that, as in Table 2, the coefficient for the inflation gap is significantly higher compared to the coefficient for the output gap. Moreover, the estimated coefficients from the panel regressions lie on the lower end of the interquartile range in both cases.

Figure A1: Distribution of Taylor Rule Coefficients from Country-by-Country Estimations



Importantly, our finding that past inflationary history shapes a central bank's monetary policy is robust to the use of the country-specific estimates from A1. Table A1, columns 1 and 4, show

results from a regression of the inflation gap and the output gap coefficients, respectively, on the average inflation rate experienced by a country prior to the adoption of the IT regime. Consistent with results in Table 5 and 6, we find that the inflation gap coefficient is strongly correlated with average past inflation, while the output gap coefficient is not. We further test the robustness of this result, columns 2 and 3 show results of a regression of the inflation gap coefficient on past inflation and additional controls, both their values at the time of IT adoption and also the average value from the time of IT adoption to the latest year. In both cases, the inclusion of these controls does not affect the magnitude nor the statistical significance of the relationship between the inflation gap coefficient and past inflation. A similar exercise shows that the output gap remains unrelated to past inflation (columns 5 and 6).

Table A1. Country-specific Estimates and Past Inflationary History

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Expected inflation coefficient			Output gap coefficient		
Pre-IT inflation	0.995***	1.021***	1.002***	0.150	0.175	0.144
	(0.317)	(0.336)	(0.329)	(0.115)	(0.173)	(0.125)
Initial FD index		-0.0746			0.200	
		(0.502)			(0.166)	
Initial trade over GDP		-0.00173			-9.23e-06	
		(0.00193)			(0.000707)	
Initial KA index		0.0181			-0.0197	
		(0.170)			(0.0644)	
Initial CBIE index		-0.223			0.0105	
		(0.319)			(0.188)	
Average FD index			-0.00109			0.00192
			(0.0160)			(0.00403)
Average tarde over GDP			-5.68e-05			1.46e-05
			(0.000121)			(4.93e-05)
Average KA index			0.00791			-0.00256
			(0.0127)			(0.00362)
Average CBIE index			-0.00423			-0.00387
			(0.0168)			(0.0104)
Constant	0.237***	0.486	0.265	0.0427***	-0.0332	0.0841
	(0.0542)	(0.348)	(0.197)	(0.0145)	(0.151)	(0.0905)
Observations	28	28	28	28	28	28
R-squared	0.415	0.441	0.436	0.091	0.151	0.135

Bootstrapped standard errors in parenteheses.
*** p<0.01, ** p<0.05, * p<0.1

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