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Inflation Targeting and Private Domestic Investment in Developing Countries

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Abstract

Does inflation targeting foster private domestic investment in developing countries? A few studies have attempted to examine this issue, with mixed results. Here we argue that by anchoring public expectations firmly, the inflation targeting framework should enhance monetary policy credibility and macroeconomic stability, thereby promoting investment incentives. Using data from 62 countries over the period 1990-2019 and applying propensity score matching methods, we find that inflation targeting significantly increases domestic investment. However, inflation deviations from the target reduce the favorable effect of inflation targeting on investment. Furthermore, the positive effect of inflation targeting on investment is amplified in emerging economies and in countries with sound fiscal discipline. Finally, we explore the underlying mechanisms and show that macroeconomic stability, i.e., the reduction in inflation and its volatility, interest rate, exchange rate, and output volatility, is the main channel through which the monetary framework promotes domestic investment.

Keywords: • Inflation targeting • Private domestic investment • Developing countries • Propensity score matching • Monetary policy credibility

JEL Classification: E5, E6, E22

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1 Introduction

Since its adoption by New Zealand in 1990, the inflation targeting framework has been adopted by a growing number of developing countries to ensure macroeconomic stability. Today, nearly 40 countries have an inflation target, and more than half are emerging economies. Most of the studies focusing on developing countries suggest that a monetary framework that can strongly anchor public expectations, such as inflation targeting, significantly increases monetary policy credibility, thus reducing inflation and its volatility, interest rate, exchange rate, and output volatility (Minella et al., 2003; Calderón et al., 2004; Vega and Winkelried, 2005; Rose, 2007; Gonçalves and Salles, 2008; Lin and Ye, 2009; Lin, 2010; López-Villavicencio and Pourroy, 2019; Fratzscher et al., 2020).

The empirical literature examining the inflation targeting effects has mainly focused on macroeconomic volatility or fiscal discipline (e.g., see Lucotte, 2012; Minea and Tapsoba, 2014; Combes et al., 2018; Ogrokhina and Rodriguez, 2018; Minea et al., 2021). A few studies have examined the inflation targeting effect on private investment, with mixed results. For instance, Mukherjee and Bhattacharya (2011) find that inflation targeting did not have a significant direct impact on either investment or the responsiveness of investment to interest rate movements in emerging market economies over the period 1990 to 2009. In the same vein, applying the synthetic control method to a panel of developing and developed economies over the period 1984-2017, McCloud (2022) finds that inflation targeting adoption did not affect domestic investment in 21 out of 29 treated countries. Moreover, the author observes a decrease in domestic investment following the introduction of inflation targeting in Paraguay, Mexico, the Philippines, Colombia, Guatemala, and Ghana, while investment increased in Australia in the post-inflation targeting period. In this paper, we argue that the inflation targeting effect on domestic investment may depend on the credibility of the monetary framework, captured by inflation deviations from the target. By reaching or approaching the targets set, central banks should more strongly anchor public expectations, hence promoting monetary policy credibility, which could lead to a more conducive environment for investment. As developing countries are generally subject to high macroeconomic instability (Loayza

et al., 2007), we examine to what extent these economies may benefit from the side effects of a price stability-oriented monetary framework, such as inflation targeting.

Using data from 62 developing countries over the period 1990-2019, we examine the inflation targeting effect on domestic investment. Results from propensity score matching methods suggest that the adoption of inflation targeting leads to a statistically and economically significant increase in private investment from 2.80 to 3.26 percentage points. The strength of the results is checked by a rich robustness analysis, including sample changes, additional controls, placebo tests, and alternative estimation strategies: the bias-corrected matching estimator, the Inverse Probability Weighting estimator, and a nonparametric kernel regression. As discussed earlier, the inflation targeting effect may be heterogeneous, depending on inflation deviations from the target. Therefore, we mainly differ from Mukherjee and Bhattacharya (2011) and McCloud (2022) by considering heterogeneity over time, in order to examine to what extent inflation deviations from the target affect the regime's effectiveness. Considering this heterogeneity over time is important as, although the explicit announcement of an inflation target plays an important role in coordinating expectations, inflation deviations from the target may, in turn, reduce monetary policy credibility, thereby weakening the anchoring objective. Results from a control function regression suggest that the monetary regime is less effective when the central bank tends to deviate from its target, with pronounced ineffectiveness in cases of extreme deviations. Moreover, our data suggest that Mexico, Colombia, and Ghana, which are half of the countries identified by McCloud (2022) in which domestic investment declined after inflation targeting adoption, also report inflation deviations from the target well above the sample average. Hence, we contribute to the existing literature, by providing some mechanisms to explain why some countries do not seem to benefit from the positive effects of the monetary framework. We also find that the inflation targeting framework is more effective in countries with sound fiscal discipline and is more beneficial to emerging economies. Finally, we investigate the main channels through which inflation targeting may operate and show that enhanced credibility resulting from the adoption of the policy, leading to a more stable environment, is an

important channel through which inflation targeting affects domestic investment.

The remainder of the paper is organized as follows. The following section presents our theoretical framework. Section 3 describes our data, reports some stylized facts, and discusses the identification strategy. The main findings are presented in Section 4. Section 5 analyzes the sensitivity of our results. Section 6 deals with the main transmission channels. A final section concludes.

2 Theoretical framework

2.1 Investment under uncertainty

There is a large literature on the link between uncertainty and investment. Older theoretical models developed by [Lucas Jr \(1967\)](#) or [Nickell \(1974\)](#) suggest that uncertainty reduces investment in the presence of adjustment costs, or when there is irreversibility in the production process. Indeed, investment involves irreversible costs that affect firm profits or expected profitability ([Carruth et al., 2000](#)). Hence, when faced with uncertainty, households and investors tend to adopt a «*wait and see*» strategy, as this gives them the opportunity to process new information before making an investment decision ([Bachmann and Bayer, 2013](#); [Stokey, 2016](#)). From an empirical perspective, [Pindyck \(1986\)](#) has shown that increased uncertainty reduces investment. Other subsequent studies have found similar results. For instance, using a panel of 42 developing countries, [Aizenman and Marion \(1999\)](#) show that higher volatility reduces the average rate of investment, with effects proportional to the magnitude of variability in different macroeconomic indicators. Similar evidence is provided by [Gavin and Hausmann \(1998\)](#) for Latin American economies. There is also evidence in the literature that uncertainty undermines firm investment and performance (e.g., see [Bloom et al., 2007](#); [Chong and Gradstein, 2009](#); [Bloom et al., 2018](#)). Finally, in the same vein, studies suggest that exchange rate uncertainty has a negative impact on investment decisions (e.g., see [Serven, 1998](#); [Bleaney and Greenaway, 2001](#); [Belke and Gros, 2001](#); [Servén, 2003](#)).

2.2 Credibility as a transmission channel of the monetary regime on domestic investment

Evidence is found in the literature that the explicit announcement of an inflation target plays an important role in coordinating expectations and significantly increases monetary policy credibility in developing countries, thus reducing inflation and its volatility, interest rate, and exchange rate volatility (Minella et al., 2003; Calderón et al., 2004; Vega and Winkelried, 2005; Rose, 2007; Gonçalves and Salles, 2008; Lin and Ye, 2009; Lin, 2010; López-Villavicencio and Pourroy, 2019). Another part of the literature provides some evidence of the side effects of the inflation targeting framework. For example, using data on the Brazilian economy, De Mendonça and Lima (2011) find that a successful inflation targeting framework provides a stable macroeconomic environment that encourages private investment. Similarly, Montes (2013) finds that inflation targeting has been an important strategy for investment and job creation in Brazil. Finally, interest rate volatility is also a key factor in the transmission of monetary policy shocks. For instance, in the presence of a high inflation rate, a central bank following the Taylor rule will pursue a restrictive monetary policy by raising interest rates. Yet, high interest rates in turn limit access to credit and depress investment, as suggested by the traditional neoclassical framework (Harrison et al., 2004; Beck et al., 2005).¹ However, achieving a relatively low inflation target under the inflation targeting framework may crowd out interest rate hikes to converge inflation toward the target. Against this background, empirical evidence is provided by De Mendonça and Souza (2009) for the Brazilian economy, that higher credibility implies smaller changes in the interest rate to control inflation. This result is worth paralleling that of Montes (2013), who provides evidence that changes in the short-term interest rate significantly impact the real cost of capital and firm investment decisions.

To summarize, in line with the existing literature, we believe that enhanced mon-

¹Interest rate movements are also highly correlated with asset prices, such as stocks, bonds, or real estate, through a wealth effect. However, in the context of this study, this channel is probably not very relevant as the participation of firms from developing countries in stock markets is generally low.

etary policy credibility resulting from inflation targeting adoption, leading to greater macroeconomic stability, is the main channel through which the monetary framework may affect domestic investment.²

3 Data and Methodology

3.1 Data

Our dataset consists of 62 developing countries, 23 inflation-targeting, and 39 non-inflation-targeting, over the period 1990-2019. We consider country-year observations and examine 251 treated and 921 untreated observations.³ The choice of this time horizon was conditioned by data availability, since numerous countries in the sample did not have sufficient observations before the year 1990. The dependent variable is measured as the share of private-sector gross fixed capital formation to GDP, and is drawn from the IMF's Investment and Capital Stock database (we use the latest dataset covering the year 2019). The variable of interest, inflation targeting, is captured by a binary variable equal to 1 if a country i in the year t was targeting inflation, and zero otherwise. From the control group, to be a good counterfactual for the treatment group, we exclude countries whose real GDP per capita is lower than that of the poorest treated country in the sample, and those with a smaller population than the smallest treated country in the sample, as in [Lin and Ye \(2009\)](#). A distinction is made between two major starting dates: soft or informal inflation targeting, and full-fledged or hard inflation targeting. Soft inflation targeting refers to the date declared by the central bank itself, while hard inflation targeting relates to the date declared by researchers, considered to

²Another potential channel for the impact of the inflation targeting framework on investment may be the fiscal discipline effect induced by the adoption of the regime ([Lucotte, 2012](#); [Minea and Tapsoba, 2014](#); [Combes et al., 2018](#); [Minea et al., 2021](#); [Apeti et al., 2023](#)). However, we believe that this is rather an indirect channel. Here we focus on the key channels.

³In our sample, observations relating to a country that is not yet treated (but will be) are included in the control group, as our sample consists of a time dimension. That said, our approach may match some observations for certain treated countries to these same countries at a time when the country is not treated. Results are robust when we exclude from the control group observations for a country that is not yet treated but will be (see subsection [A.3](#) of the Appendix).

be the confirmed date from which the central bank operates under inflation targeting.

Table 1 details the definitions and sources of our main variables. Table 2 reports the descriptive statistics of the main variables used in the study. Section B (Appendix) presents the composition of the sample in more detail.

3.2 Stylized facts

We report some correlational evidence between inflation targeting and the average private domestic investment rates in the countries in our sample over our study period (1990-2019). Figure 1 shows, on average, a higher domestic investment rate (in percentage of GDP) in inflation-targeting compared to non-inflation-targeting countries (15.65% versus 11.83%). Moreover, the investment gap between the two groups is statistically significant ($t = -11.87$; p-value: 0.00).

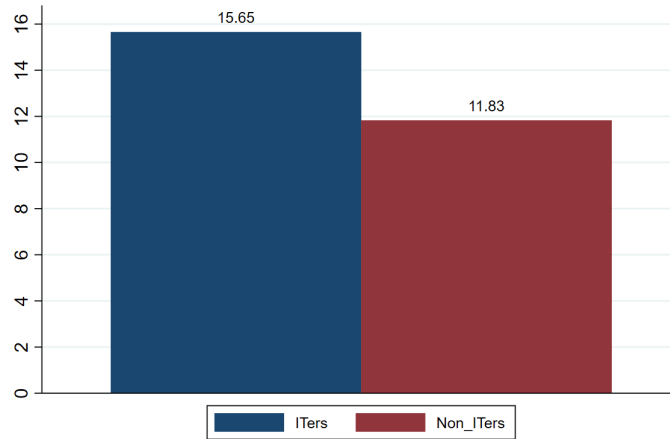


Figure 1: **Average private investment rates (%GDP) in inflation-targeting and non-inflation-targeting countries (1990-2019)**

Notes: This figure presents the average private domestic investment rates between inflation-targeting and non-targeting countries over the period 1990-2019. The statistics cover 251 treated and 921 untreated observations. These statistics relate only to the 62 developing countries considered in our study.

Table 1: List of variables and their sources

Variables	Nature	Sources
Dependent variable		
Private domestic investment (% GDP)	Continuous	IMF Investment and Capital Stock dataset
Treatment variable		
Inflation Targeting	Dummy	Rose (2007) ; Roger (2010) ; Jahan (2012)
Baseline model control variables		
Inflation	Continuous	WDI, World Bank
Real GDP per capita growth	Continuous	WDI, World Bank
Trade openness	Continuous	WDI, World Bank
Financial development (Domestic credit to private sector, in % of GDP)	Continuous	WDI, World Bank
Control of corruption	Score between 0 and 6	ICRG
Fixed exchange rate	Dummy	Author's construction from Ilizetzi et al. (2019)
Broad money growth	Continuous	WDI, World Bank
Additional control variables		
Unemployment rate	Continuous	WDI, World Bank
Primary budget balance	Continuous	Kose et al. (2022)
Public debt	Continuous	Kose et al. (2022)
Public investment	Continuous	IMF Investment and Capital Stock dataset
Foreign direct investment	Continuous	WDI, World Bank
Governor turnover	Dummy	Dreher et al. (2008) ; Dreher et al. (2010)
Government stability	Score between -2.5 to 2.5	ICRG
Sound fiscal discipline	Dummy	Author's construction based on Kose et al. (2022)
Rule of law	Score ranging from -2.5 to 2.5	Worldwide Governance Indicators (WGI) database
Human rights	Score ranging from approximately -3 to 3	Fariss (2014)

Table 2: Summary statistics for the main model variables

	Variables	Obs.	Mean	Sd	Min	Max
Total sample						
	Private domestic investment	1,842	12.520	5.529	0.085	32.343
	Inflation, one-year lag	1,744	31.911	253.890	-8.484	7481.664
	Real GDP per capita growth	1,842	2.297	3.920	-22.517	15.161
	Financial development (Log.)	1,502	3.289	0.826	0	5.114
	Control of corruption	1,717	2.48	0.894	0	6
	Trade openness	1,764	64.866	31.115	1.219	220.41
	Fixed exchange rate dummy	1,674	0.244	0.430	0	1
	Broad money growth	1,784	34.242	260.751	-50.812	7677.834
Inflation-targeting countries						
	Private domestic investment	334	15.651	4.356	7.652	28.631
	Inflation, one-year lag	334	5.401	3.669	-1.545	19.247
	Real GDP per capita growth	334	2.782	2.660	-6.674	11.315
	Financial development (Log.)	320	3.701	0.5865	2.538	5.013
	Control of corruption	311	2.514	0.785	1	6
	Trade openness	334	67.674	31.804	20.982	168.341
	Fixed exchange rate dummy	265	0.015	0.122	0	1
	Broad money growth	334	12.114	8.312	-4.698	82.588
Non-inflation-targeting countries						
	Private domestic investment	1,508	11.826	5.522643	0.085	32.343
	Inflation, one-year lag	1,410	38.190	282.011	-8.484	7481.664
	Real GDP per capita growth	1,508	2.190	4.1401	-22.517	15.161
	Financial development (Log.)	1,182	3.177	0.845	0	5.114
	Control of corruption	1,406	2.472	0.917	0	5
	Trade openness	1,430	64.210	30.926	1.219	220.407
	Fixed exchange rate dummy	1,409	0.287	0.452	0	1
	Broad money growth	1,450	39.339	288.979	-50.812	7677.834

3.3 Methodology

We follow the program evaluation methodology, which consists in estimating the average treatment effect on the treated (ATT), defined as follows:

$$ATT = E[(Y_{i1} - Y_{i0})|T_i = 1] = E[(Y_{i1}|T_i = 1)] - E[(Y_{i0}|T_i = 1)] \quad (1)$$

T_i (treatment) is a dummy variable equal to 1 for a country i that has adopted inflation targeting, and zero otherwise. Y_{i1} captures the private domestic investment rate

when the country adopts inflation targeting, and Y_{i0} is the private domestic investment rate that would have been observed if the country had not adopted the policy. The problem is that we cannot observe Y_{i1} and Y_{i0} simultaneously. We are therefore faced with a counterfactual dilemma. One solution would be to compare the average levels of private investment between inflation-targeting and non-inflation-targeting countries. However, this approach assumes that the treatment assignment is random. Such an assumption would be ad hoc, since the treated countries may have chosen to implement an inflation targeting policy after a crisis or a series of high inflation episodes. Therefore, inflation targeting adoption may be correlated with unobservable factors that also affect the overall performance of the economy, including domestic investment. In this case, a simple difference in the outcome variable between the two groups of countries would bias the estimates, given the potential selection issue associated with policy adoption. To solve this problem, we follow previous studies (e.g., see, among others, [Lin and Ye, 2007](#); [Lin and Ye, 2009](#); [Lucotte, 2012](#); [Minea and Tapsoba, 2014](#); [Balima et al., 2017](#); [Minea et al., 2021](#); [Gong and Qian, 2022](#)) and implement the propensity score matching (PSM) method developed by [Rosenbaum and Rubin \(1983\)](#). As previously discussed, intuitively, if there is a selection bias in inflation targeting adoption, we would expect treated observations to differ from untreated ones, which could strongly influence the average difference in investment between targeting and non-targeting countries. The PSM method consists in matching the group of inflation-targeting to non-targeting countries, based on the same observables summarized in the propensity scores or a country's probability to adopt the policy. Hence, the matching approach controls for observable differences between inflation-targeting and non-inflation-targeting countries that could affect the outcome variable. Thus, after matching, the difference between the outcome of a treated country and a matched counterfactual can be attributed to inflation targeting. The propensity score, i.e., the probability of treatment assignment, is based on the Conditional Independence Assumption, which means that conditional upon the vector of covariates X , inflation targeting adoption must be independent of the outcome (private investment rate). Under the CIA, in Equation (1) we can replace the unobservable term

$E[(Y_{i0}|T_i = 1)]$ with the observable term $E[(Y_{i0}|T_i = 0, X_i)]$ to get Equation (2).

$$ATT = E[(Y_{i1}|T_i = 1, X_i)] - E[(Y_{i0}|T_i = 0, X_i)] \quad (2)$$

We impose the common support to ensure that for each treated observation, there is at least one untreated counterfactual that is as similar to it as possible, to allow for matching. Therefore, we rewrite the ATT as follows:

$$ATT = E[(Y_{i1}|T_i = 1, p(X_i))] - E[(Y_{i0}|T_i = 0, p(X_i))] \quad (3)$$

where $p(X_i) = P_r(IT_i = 1|X_i)$ provides, conditional on the set of covariates X , the probability of a country adopting inflation targeting. Finally, subsection A.1 of the Appendix examines the Conditional Independence Assumption and the hypothesis of common support.

4 Results

4.1 Propensity score estimates

We estimate the propensity scores from a probit model,⁴ using as dependent variable a binary equal to 1 if a country i in the year t was targeting inflation, and zero otherwise. As commonly found in the literature (e.g., see [Lin and Ye, 2009](#); [Lucotte, 2012](#); [Minea and Tapsoba, 2014](#); [Ogrokhina and Rodriguez, 2018](#)), we control via two categories of variables. The first category includes variables that could explain the likelihood of a developing country adopting inflation targeting. For this first category, we include the following precondition variables: lagged inflation rate,⁵ broad money growth, real GDP per capita growth, and domestic credit to the private sector (used as a proxy for financial development). Lagged inflation rate and broad money growth are generally found

⁴Estimates from a logit model remain comparable to those obtained from the probit, suggesting that the normality assumption of the probit model is not compromised.

⁵As argued by [Lucotte \(2012\)](#), the lag in inflation avoids a simultaneity bias between inflation targeting and the variable.

to be negatively correlated with the probability of adopting inflation targeting, since a country is more likely to adopt an inflation targeting policy when its inflation rate is at a reasonably low level, preferably after successful disinflation (Masson et al., 1997; Truman, 2003; Balima et al., 2017). Indeed, a relatively low inflation rate can make the announced targets credible and promote the effectiveness of the regime. In this context, Lin and Ye (2007) find that the lagged inflation rate negatively affects the targeting decision in industrial countries. Although Masson et al. (1997) find this result for developed countries, they stress that the environment of central banks in developing countries differs radically from that in advanced economies. Indeed, many developing countries are characterized by a much higher use of seigniorage than in advanced economies, due to a number of structural characteristics, such as concentrated and unstable tax revenue sources, poor tax collection procedures, asymmetric income distribution, and political instability (Masson et al., 1997). Hence, the ability of the central bank to conduct independent monetary policy in developing economies may be hampered by a heavy reliance on seigniorage. However, there is evidence in the literature that the negative relationship between lagged inflation and inflation targeting adoption seems to hold for developing countries as well (e.g., see, among others, Lin and Ye, 2009; Lucotte, 2012; Balima et al., 2017). Lin and Ye (2009) and Minea and Tapsoba (2014) find evidence that lower broad money growth is a key driver of inflation targeting adoption. The correlation between GDP per capita growth and inflation targeting adoption is generally ambiguous. From a theoretical point of view, one can assume that countries with good macroeconomic performance are more likely to adopt a credible inflation targeting policy, as well as the notion that a better economic situation can crowd out the adoption of reforms such as inflation targeting. Financial development is found to positively affect a country's likelihood of adopting inflation targeting by limiting the monopoly of seigniorage by the central bank (Minea et al., 2021). Moreover, a developed financial system promotes financial inclusion and better tax revenue mobilization. This should compensate for the loss of seigniorage income due to inflation targeting adoption, and, therefore, allow the government to avoid exerting pressure on the central bank to finance its deficits, an essential condition for ensuring a credible targeting policy.

The second category of controls includes variables that could affect the likelihood of adopting exchange rate targeting as an alternative framework for monetary policy. Referring to previous studies, we consider for this second category trade openness and the fixed exchange rate regime. Since inflation targeting is implemented under a flexible exchange rate regime, it is negatively correlated with the adoption of the fixed exchange rate regime. In the same way, empirical studies show a negative correlation between trade openness and the inflation targeting regime. The explanation commonly provided in the literature is that countries more open to trade are more likely to target the exchange rate to guard against external shocks (Brenner and Sokoler, 2010). Finally, we also control for institutional quality, proxied by the International Country Risk Guide (ICRG)'s corruption control index, which ranges from 0 (highest perceived corruption) to 6 (highest perceived probity). Since better institutional quality may reflect the central bank's ability to implement a credible targeting regime, this variable may be positively correlated with a country's probability of adopting inflation targeting.

Table 3 reports propensity score estimates from a probit model. The baseline model results that refer to conservative dates (hard inflation targeting) are reported in column [1].⁶ The findings support most of our assumptions. Consistent with previous work (see Lin and Ye, 2009; Lucotte, 2012; Minea and Tapsoba, 2014), lagged inflation rate, broad money growth, trade openness, and the fixed exchange rate regime reduce the likelihood of a country adopting inflation targeting. Conversely, financial development is positively correlated with inflation targeting adoption, in line with Lucotte (2012). Our baseline model also suggests that better corruption control enhances a country's probability of adopting the monetary regime. Finally, the overall fit of the regression, with a Pseudo-R² of 0.31 for our baseline model, is reasonable and comparable to that of previous studies (e.g., see Lin and Ye, 2009; Lucotte, 2012; Minea and Tapsoba, 2014).

⁶Our results, available on request, remain robust when referring to soft inflation targeting.

Table 3: Probit estimates of propensity scores

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
Dependent: Hard inflation targeting														
Lagged inflation	-0.0786*** (0.0122)	-0.0786*** (0.0122)	-0.0783*** (0.0123)	-0.0785*** (0.0123)	-0.0810*** (0.0124)	-0.0791*** (0.0124)	-0.0786*** (0.0122)	-0.0797*** (0.0123)	-0.0702*** (0.0124)	-0.0779*** (0.0134)	-0.0919*** (0.0130)	-0.0903*** (0.0134)	-0.0819*** (0.0125)	-0.0794*** (0.0126)
Real GDP per capita growth	0.0189 (0.0163)	0.0189 (0.0163)	0.0178 (0.0164)	0.0173 (0.0166)	0.0167 (0.0165)	0.0209 (0.0168)	0.0189 (0.0163)	0.0206 (0.0167)	0.0112 (0.0165)	0.0057 (0.0177)	0.0342** (0.0172)	0.0086 (0.0170)	0.0182 (0.0165)	0.0184 (0.0169)
Financial development (Log.)	0.3409*** (0.0818)	0.3409*** (0.0818)	0.3418*** (0.0819)	0.3511*** (0.0822)	0.3126*** (0.0830)	0.3409*** (0.0830)	0.3409*** (0.0818)	0.3227*** (0.0838)	0.4012*** (0.0843)	0.3933*** (0.0885)	0.4378*** (0.0874)	0.3418*** (0.0830)	0.3195*** (0.0824)	0.3383*** (0.0834)
Control of corruption	0.1339** (0.0621)	0.1339** (0.0621)	0.1319** (0.0622)	0.1331** (0.0623)	0.1440** (0.0626)	0.1347** (0.0633)	0.1339** (0.0621)	0.1372** (0.0633)	0.2207*** (0.0665)	0.3163*** (0.0729)	0.0939 (0.0635)	0.1140* (0.0651)	0.1536** (0.0628)	0.0014 (0.0709)
Trade openness	-0.0046*** (0.0016)	-0.0046*** (0.0016)	-0.0045*** (0.0016)	-0.0048*** (0.0017)	-0.0048*** (0.0016)	-0.0045*** (0.0016)	-0.0048*** (0.0016)	-0.0045*** (0.0017)	-0.0064*** (0.0017)	-0.0078*** (0.0018)	-0.0039** (0.0017)	-0.0076*** (0.0018)	-0.0044*** (0.0016)	-0.0082*** (0.0018)
Fixed exchange rate dummy	-2.2884*** (0.2134)	-2.2884*** (0.2134)	-2.2875*** (0.2134)	-2.2828*** (0.2137)	-2.0076*** (0.2323)	-2.2904*** (0.2140)	-2.2884*** (0.2134)	-2.2744*** (0.2138)	-2.2295*** (0.2144)	-2.3184*** (0.2198)	-2.3175*** (0.2211)	-2.3712*** (0.2173)	-2.2787*** (0.2160)	-2.4261*** (0.2224)
Broad money growth	-0.0190*** (0.0055)	-0.0190*** (0.0055)	-0.0188*** (0.0056)	-0.0184*** (0.0056)	-0.0197*** (0.0056)	-0.0188*** (0.0056)	-0.0190*** (0.0055)	-0.0181*** (0.0055)	-0.0197*** (0.0057)	-0.0195*** (0.0060)	-0.0162*** (0.0057)	-0.0229*** (0.0059)	-0.0180*** (0.0056)	-0.0172*** (0.0057)
Lagged unemployment rate							0.0087 (0.0083)							
Lagged primary budget balance									0.0107 (0.0172)					
Lagged public debt										-0.6372*** (0.0924)				
Lagged public investment											0.0975*** (0.1051)			
Lagged FDI													-0.3606** (0.1762)	
Governor turnover														0.4173*** (0.0785)
Government stability														
Constant	-0.8118*** (0.3136)	-0.8118*** (0.3136)	-0.8163*** (0.3137)	-0.8370*** (0.3155)	-0.6919** (0.3199)	-0.8193*** (0.3147)	-0.8118*** (0.3136)	-0.8318*** (0.3144)	-1.0980*** (0.3275)	0.1100 (0.4802)	-0.3250 (0.3359)	-0.7228** (0.3222)	-0.7571** (0.3145)	-0.0380 (0.3586)
Observations	1181	1181	1134	1163	994	1155	1181	1152	1072	980	1174	1177	1153	1142
Pseudo R ²	0.31	0.31	0.29	0.31	0.25	0.31	0.31	0.31	0.30	0.32	0.34	0.34	0.31	0.33

Notes: This table reports propensity score estimates from a probit model. The dependent variable is a dummy equal to 1 if a country i in the year t has an inflation target, and zero otherwise, referring to conservative dates or hard inflation targeting. Column [1] reports the main model's results. Columns [2]-[14] report estimates from different robustness checks. Specifically, in columns [2]-[7], we exclude the year 1990, hyperinflation episodes, years with financial crises, countries belonging to a monetary union, and dollarized countries, as well as those with a fixed de facto exchange rate or currency boards, new inflation target countries (countries that adopted the monetary regime at the end of the study period), and Central and Eastern European Countries (CEECs), respectively. Columns [8]-[14] augment the main equation, adding the following variables: lagged unemployment rate, lagged primary budget balance, lagged public debt, lagged public investment, lagged foreign direct investment, governor turnover, and government stability, respectively. Standard errors are in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

4.2 Results from Matching

By matching inflation-targeting with non-inflation-targeting countries comparable in terms of observable characteristics correlated with the treatment and potentially with the outcome variable, the propensity score matching method allows for mitigating the selection bias in inflation targeting adoption. The observable characteristics between the two groups of countries are summarized in the propensity scores estimated in subsection 4.1. Then, these scores are used to match each treated country with at least one of its untreated peers.⁷ We refer to the existing literature and draw upon four propensity score matching methods. First, the Nearest-Neighbors method matches each treated observation to the n untreated observations with the most comparable propensity score possible. Following Lin and Ye (2009) and Huang et al. (2019), we retain one-to-one-nearest-neighbor and three-nearest-neighbor matching. Second, the radius method (Dehejia and Wahba, 2002) matches a treated observation to untreated observations located at a certain distance based on propensity scores. We retain the small ($R = 0.005$), medium ($R = 0.01$), and wide ($R = 0.05$) radius. Third, the Kernel method (Heckman et al., 1998) matches each treated observation with a weighted average of all the untreated observations, the weights being inversely proportional to the gap between the propensity scores of treated and untreated observations. Finally, the Local Linear Regression (Heckman et al., 1998) proceeds like Kernel Matching but uses a linear factor in the weighting function.

From the propensity scores of the baseline model reported in column [1] of Table 3, we estimate the inflation targeting effect on private domestic investment. Results of the baseline model using the conservative dates (hard inflation targeting) are reported in column [1] of Table 4.⁸ The estimated coefficients are positive and significant, with a magnitude ranging between 2.80 (Nearest-Neighbors Matching) and 3.26 (Radius Matching) percentage points, suggesting that inflation targeting significantly increases private domestic investment in inflation-targeting compared to non-targeting countries. Furthermore, since the coefficients represent between 22% and 26% of the sample average (see Table 2), these effects are economically significant.

⁷It should be noted that the covariates are only used in the propensity scores and not to calculate the difference in the outcome in the equation.

⁸Our results remain robust when referring to soft inflation targeting (Section .a5 of the Appendix reports these results).

Table 4: The effect of inflation targeting on private domestic investment in %GDP (using conservative starting dates)

	Nearest-Neighbors Matching		Radius Matching		Kernel Matching		Local Linear Regression	
Treatment: Hard inflation targeting	N=1	N=3	r=0.005	r=0.01	r=0.05	r=0.05	r=0.05	r=0.05
Baseline model [1] ATT	2,8049*** (0.7321)	3,1158*** (0.6002)	3,2602*** (0.5343)	3,1803*** (0.4966)	3,0301*** (0.4506)	3,0512*** (0.4478)	2,8575*** (0.4586)	2,8575*** (0.4586)
Treated observations	251	251	251	251	251	251	251	251
Control observations	921	921	921	921	921	921	921	921
Total observations	1,172	1,172	1,172	1,172	1,172	1,172	1,172	1,172
Robustness checks								
[2] Excluding year 1990	2,8049*** (0.6922)	3,1158*** (0.5694)	3,2602*** (0.5387)	3,1803*** (0.5099)	3,0301*** (0.4591)	3,0512*** (0.4571)	2,8575*** (0.4390)	2,8575*** (0.4390)
[3] Excluding hyperinflation episodes	2,7395*** (0.7128)	2,9115*** (0.5755)	3,1695*** (0.5235)	3,1468*** (0.4983)	3,0051*** (0.4737)	3,0404*** (0.4597)	2,8535*** (0.4569)	2,8535*** (0.4569)
[4] Excluding financial crises	2,4647*** (0.6559)	2,8952*** (0.5720)	2,9130*** (0.5450)	2,9777*** (0.5053)	3,0830*** (0.4568)	3,1003*** (0.4350)	2,9207*** (0.4094)	2,9207*** (0.4094)
[5] Excluding regimes incompatible with inflation targeting	3,6068*** (0.6700)	3,3778*** (0.6008)	3,2982*** (0.5670)	3,3497*** (0.4919)	3,0192*** (0.4668)	3,0338*** (0.4684)	2,8542*** (0.4684)	2,8542*** (0.4684)
[6] Excluding new inflation-targeting countries	2,5702*** (0.7332)	3,0967*** (0.6127)	3,2800*** (0.5553)	3,2099*** (0.5274)	3,0885*** (0.4646)	3,0928*** (0.4664)	2,9090*** (0.4735)	2,9090*** (0.4735)
[7] Excluding CEECs	3,3084*** (0.7879)	3,4715*** (0.6812)	3,3301*** (0.5885)	3,3891*** (0.5690)	3,3539*** (0.5463)	3,3559*** (0.5644)	3,1876*** (0.5770)	3,1876*** (0.5770)
[8] Including lagged unemployment rate	3,0124*** (0.7061)	3,1892*** (0.5850)	3,2047*** (0.5362)	2,9619*** (0.5028)	3,1085*** (0.4372)	3,0859*** (0.4249)	2,8891*** (0.4435)	2,8891*** (0.4435)
[9] Including lagged primary budget balance	3,0537*** (0.6765)	2,7451*** (0.5949)	2,9816*** (0.5606)	3,0692*** (0.5236)	2,8561*** (0.4596)	2,8632*** (0.4768)	2,7695*** (0.5205)	2,7695*** (0.5205)
[10] Including lagged public debt	2,5762*** (0.7246)	2,0814*** (0.6489)	2,4569*** (0.5694)	1,9990*** (0.5642)	1,8707*** (0.5190)	1,8641*** (0.5111)	1,7760*** (0.4847)	1,7760*** (0.4847)
[11] Including lagged government investment	3,1676*** (0.6505)	3,4114*** (0.5266)	3,3239*** (0.4725)	3,3606*** (0.3510)	4,1760*** (0.3640)	3,6304*** (0.3640)	3,7734*** (0.3607)	3,7734*** (0.3607)
[12] Including lagged FDI	1,8512*** (0.7266)	2,3759*** (0.6484)	2,2125*** (0.5955)	2,3134*** (0.5903)	2,4923*** (0.5131)	2,5384*** (0.5017)	2,4255*** (0.5020)	2,4255*** (0.5020)
[13] Including governor turnover	2,9896*** (0.7022)	3,1229*** (0.5752)	3,5946*** (0.5344)	3,2879*** (0.4781)	3,1316*** (0.4254)	3,1238*** (0.4718)	2,9509*** (0.4364)	2,9509*** (0.4364)
[14] Including government stability	3,0993*** (0.6871)	2,8253*** (0.5910)	3,2825*** (0.6024)	3,0527*** (0.5324)	2,5792*** (0.4771)	2,5797*** (0.4871)	2,4277*** (0.4486)	2,4277*** (0.4486)
Quality of the matching								
Pseudo R ²	0.008	0.005	0.005	0.006	0.006	0.005	0.008	0.008
Rosenbaum bounds sensitivity tests	1.9	2.6	3.1	3.3	3.8	3.8	3.3	3.3
Standardized bias (p-value)	0.570	0.862	0.886	0.751	0.797	0.813	0.570	0.570

Notes: This table reports estimates of the effect of inflation targeting on domestic investment from propensity score matching. The treatment variable is a dummy equal to 1 if a country i in the year t has an inflation target, and zero otherwise, referring to conservative dates. The dependent variable is measured as the share of private-sector gross fixed capital formation to GDP. Line [1] reports the main model results. Lines [2]-[14] report estimates from different robustness checks. Specifically, in lines [2]-[7], we exclude the year 1990, hyperinflation episodes, years with financial crises, countries belonging to a monetary union, and dollarized countries, as well as those with a fixed de facto exchange rate or currency boards, new inflation target countries (countries that adopted the monetary regime at the end of the study period), and Central and Eastern European Countries (CEECs), respectively. Lines [8]-[14] augment the main equation, adding the following variables: lagged unemployment rate, lagged primary budget balance, lagged public debt, lagged public investment, lagged foreign direct investment, governor turnover, and government stability, respectively. Bootstrapped standard errors based on 500 replications are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1

5 Sensitivity analysis

5.1 Robustness

In columns [2]-[14] of Table 3, we test the robustness of the propensity scores of the baseline model (column [1]) using alternative specifications. First, we estimate new propensity scores using different subsamples (columns [2]-[7]). In column [2] (Table 3), we ignore the year 1990, which initiates inflation targeting adoption. Next, since some countries in the sample experienced at least one episode of hyperinflation from 1990-2019, one may expect that such extreme values could bias the estimations. Consequently, in column [3], we exclude from the sample any episode of hyperinflation, defined as an annual inflation rate equal to or higher than 40% (Lin and Ye, 2009). For the same reasons, in column [4], we ignore years marked by financial crises. Our sample includes a few countries with a fixed exchange rate regime, which therefore implicitly have an inflation target. Since this regime is not compatible with inflation targeting adoption, in column [5] we exclude from the sample countries belonging to a monetary union and dollarized countries, as well as those with a fixed de facto exchange rate or currency boards. In column [6], we exclude new inflation-targeting countries from treated countries, since countries that have recently adopted the monetary framework are unlikely to have a sound fiscal policy that can enhance the credibility and effectiveness of the regime. Excluding these countries from the sample allows us to avoid a possible bias in our results, due to the absence of a potential situation of fiscal dominance among the new treated countries. Finally, since 1990, Central and Eastern European Countries (CEECs) have implemented a wave of reforms, including financial openness, which have significantly reduced the gap between their economic performance and the EU average. In addition, these countries have experienced massive foreign direct investment (FDI) inflows, which could have a significant effect on domestic investment. Therefore, in column [7], we exclude them from the sample. Overall, the new propensity score estimates are comparable to those of the baseline model (column [1], Table 3), even if the sign of GDP per capita growth is sometimes ambiguous. From the new scores, we compute new average treatment effects reported in columns [2]-[7] of Table 4. New estimates yield similar results to those of the baseline model reported in column [1] of Table 4, supporting our previous conclusions.

We further augment our main equation, adding additional variables likely to be correlated both with inflation targeting and the outcome variable (columns [8]-[14], Table 3). These variables include lagged unemployment rate, lagged primary budget balance, lagged public debt, lagged public investment, lagged foreign direct investment, central bank independence (proxied by the variable «Governor turnover», which is a dummy equal to 1 if the central bank governor is changed informally before the end of his or her term, and zero otherwise), and government stability.⁹ New estimated scores reported in columns [8]-[14] remain qualitatively comparable to those obtained previously and similar to those obtained for our baseline model. The results from the probit model suggest that FDI and government stability are positively correlated with the probability of a country adopting inflation targeting. However, public debt, public investment, and weak central bank independence reduce the likelihood of adopting the regime. From the new estimated propensity scores in columns [8]-[14] of Table 3, we recompute the average treatment effects reported in columns [8]-[14] of Table 4. New coefficients remain qualitatively and quantitatively comparable to the baseline model results (column [1], Table 4).

Subsections A.3, A.4, A.5, and A.6 of the Appendix report some additional robustness. More specifically, in subsection A.4, we perform random assignment to treatment, considering fake adoption dates, and show that our main estimations from true adoption dates are not biased by omitted variables or a spurious trend. In Subsection A.6, we perform some econometric robustness, using three alternative estimation strategies: the bias-corrected matching estimator, the Inverse Probability Weighting (IPW) estimator, and a nonparametric kernel regression. The results remain stable. Finally, in subsections A.3 and A.5, we change our matching approach and consider an alternative measure of the treatment variable, referring to soft inflation targeting. Again, the new estimates support our main results.

5.2 Heterogeneity

Next, we examine some heterogeneity features of the treatment effect, using a control function regression approach, as in Lin and Ye, 2009. First, subsection 5.2.1 assesses the effectiveness of the monetary framework by looking at inflation deviations from the target.

⁹Subsection A.2 of the Appendix discusses the rationale for these variables.

Second, in subsection 5.2.2, we examine the role of economic and institutional factors.

5.2.1 Do deviations from the target matter?

By reaching or approaching the inflation target, central banks influence public expectations, thus creating a decision-making framework that increases monetary policy credibility, which may lead to a more conducive environment for investment. In this context, we argue that although our main estimates suggest a positive and significant effect of inflation targeting on investment, this result may strongly depend on inflation deviations from the target. Referring to [Ogrokhina and Rodriguez \(2018\)](#), we compute inflation deviations from the target as the difference between realized inflation and the inflation target for each treated country over the period 1990-2019.¹⁰ We report an average deviation of 1.18 percentage points among inflation-targeting countries and a median of zero. As can be seen in [Figure 2](#), which plots the kernel density of deviations, most inflation-targeting countries do not deviate from their target, resulting in a distribution of deviations concentrated around zero. The long tail is explained by a few countries with large deviations.

In the first column of [Table 5](#), we estimate the inflation targeting effect on the outcome variable, using a simple OLS regression. Results suggest that inflation targeting increases domestic investment by an average of 3.82 percentage points. In column [2], we include the estimated propensity score (Pscore) for the baseline model as a control function to correct for potential self-selection. The coefficient of the propensity score is positive and significant, suggesting the presence of a selection bias. The coefficient of the treatment variable remains positive and significant, with a magnitude of approximately 3.01 percentage points. To capture potential heterogeneity in the regime's effectiveness regarding inflation deviations from the target, in column [3] ([Table 5](#)) we interact the treatment variable with the level of deviation to allow for possible asymmetric deviations between negative and positive deviations. As can be seen, the coefficient on the interactive term does not suggest any presence of heterogeneity. In column [4], following [Ogrokhina and Rodriguez \(2018\)](#), we consider the squared deviation of inflation from the

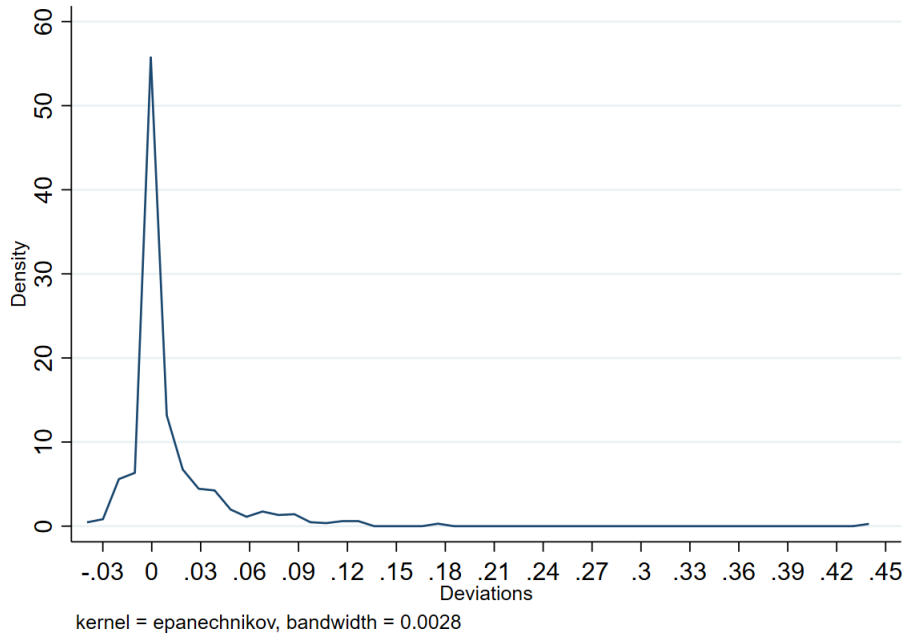
¹⁰Data on inflation targets are extracted from [Jahan \(2012\)](#) and publications by the central bank of each country.

target, rather than the level of deviation, as some deviations are negative. Results suggest that inflation deviations from the target (especially when negative deviations are taken into account) reduce the effectiveness of the monetary framework. Last, in column [5], we consider only extreme deviations from the target. The coefficient on the interactive term remains negative, but increases compared to that in column [4], suggesting that extreme deviations from the target further reduce the beneficial effect of the monetary framework on investment. Hence, although our results suggest a positive and significant effect of inflation targeting on investment, further analysis shows that the beneficial effect of the monetary framework is mitigated when the central bank tends to deviate from its target, or even becomes ineffective in cases of extreme deviations. This result should be put into perspective with some important papers in the literature that find ambiguous effects of inflation targeting on domestic investment. For instance, using pooled ordinary least squares, fixed effects IV, and the IV-GMM methodology over the period 1990-2009, [Mukherjee and Bhattacharya \(2011\)](#) find that inflation targeting did not have a significant direct impact on either investment or the responsiveness of investment to interest rate movements in emerging market economies. Likewise, using synthetic control methods for a set of developing and developed economies spanning the period 1984 to 2017, [McCloud \(2022\)](#) finds that inflation targeting adoption did not affect domestic investment in 21 out of 29 treated countries. Most strikingly, in the post-inflation targeting period, the author finds that the domestic investment response to inflation targeting decreased in Paraguay, Mexico, the Philippines, Colombia, Guatemala, and Ghana. The author implicitly claims that this result may be explained by a lack of transparency on the part of the monetary authorities due to a poor communication strategy or by the central bank’s deviations from its inflation target.¹¹ Indeed, in contrast to previous studies, notably [Mukherjee and Bhattacharya \(2011\)](#) and [McCloud \(2022\)](#), the control function regression used in our study allows us to take into account heterogeneity over time to examine to what extent deviations from the target affect the regime’s effectiveness. The credibility argument advanced by [McCloud \(2022\)](#), coupled with the results in the previous paragraph, thus seem to provide some rationale for why the monetary framework may be ineffective in some countries. Moreover, our data suggest that Mexico, Colombia, and Ghana, which are

¹¹The author rightly states: “In addition, if an IT [for inflation targeting] central bank misses its target, then this may negatively affect its credibility.” ([McCloud, 2022](#), Page 115).

half of the countries identified by [McCloud \(2022\)](#) in which domestic investment declined after inflation targeting adoption, also report inflation deviations from the target above the sample average over our study period.¹² Finally, our result deserves to be paralleled with that of [Bambe et al. \(2022\)](#), who find that the positive effect of the inflation targeting framework on firm performance is mitigated when the central bank tends to deviate from its target.

Figure 2: Distribution of inflation deviations from the target



Notes: This figure plots the kernel density of inflation deviations from the central bank’s target of the countries in our sample, over the period 1990-2019. The long tail is explained by a few countries with large deviations. Data on inflation targets are extracted from [Jahan \(2012\)](#) and publications by the central bank of each country.

5.2.2 The role of economic and institutional factors

We explore other potential sources of heterogeneity, considering fiscal discipline, the level of economic development, and the quality of institutions. In column [6] of Table 5, we interact the treatment variable with the term «Sound fiscal discipline», which is a dummy variable equal to 1 when a country i , at a time t , has a fiscal balance above its long-term average, and zero otherwise. Results suggest that inflation targeting is most effective in countries with good fiscal discipline.¹³ Next, we examine the effectiveness

¹²As mentioned earlier, we refer to [Ogrokhina and Rodriguez \(2018\)](#) and compute inflation deviations from the target as the difference between realized inflation and the inflation target for each treated country over 1990-2019. Section B (Appendix) reports these data.

¹³Results remain similar when using other indicators, such as sovereign debt ratings.

of the monetary regime according to the level of economic development, distinguishing between emerging and low-income countries, based on the IMF's classification. Emerging economies are those considered to be in transition to a developed market economy and are characterized by, among other things, a rapid increase in per capita income. Low-income countries, on the other hand, are characterized by limited structural transformation and their external financial linkages are not strong enough to be considered as emerging market economies.¹⁴ Since less developed countries are generally the least able to contain large shocks to economic activity, given their low resilience and vulnerability, they are likely to benefit more from the stability provided by the monetary framework. However, it can also be argued that emerging countries, generally characterized by better institutions than those of low-income economies, would be more likely to anchor public expectations more strongly, by either improving the central bank's communication strategy or by getting as close as possible to the target set. In Column [7] (Table 5), we interact the treatment variable with a dummy variable equal to 1 if the country is an emerging economy, and zero otherwise. The positive and significant coefficient on the interactive term suggests that inflation targeting benefits emerging countries the most, corroborating the second hypothesis. The last two columns explore potential heterogeneity features according to institutional quality, in particular the rule of law and respect for human rights. The first variable captures the quality of contract enforcement, property rights, the level of security, and law and order within the society and is extracted from the Worldwide Governance Indicators (WGI) database. The second variable captures the protection of human rights and comes from Fariss (2014). No heterogeneity seems to emerge regarding these variables.

Finally, one may wonder whether the results of this article also apply to developed countries. Subsection A.7 of the Appendix addresses this question. Overall, the literature shows that inflation targeting has no significant effect on the inflation performance of developed countries. Regarding the impact of inflation targeting on domestic investment, among developed countries, McCloud (2022) finds that domestic investment increased in Australia in the post-inflation targeting period.

¹⁴Source: IMF Fiscal Monitor database. Section B of the Appendix reports the list of emerging and low-income countries used in the study.

Table 5: Heterogeneity: Exploring conditional effects

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Hard inflation targeting (IT)	3.8252*** (0.2774)	3.0093*** (0.4156)	3.0147*** (0.4449)	3.1784*** (0.4375)	3.0725*** (0.4176)	2.3909*** (0.5105)	1.4023** (0.5448)	2.4600*** (0.4645)	2.6868*** (0.4328)
Pscore		4.0563*** (0.8881)	4.0504*** (0.9065)	3.9292*** (0.9006)	4.0200*** (0.8892)	4.0331*** (0.8889)	2.9869*** (0.8709)	2.6163** (1.0269)	4.2650*** (0.8947)
Hard IT * Level of deviation			8.2985 (12.2618)						
Hard IT * Squared deviation				-2.1378* (1.1048)					
Hard IT * Extreme deviation					-4.4103*** (0.3713)				
Hard IT * Sound fiscal discipline						1.2320** (0.6116)			
Hard IT * Emerging countries							1.4441** (0.6591)		
Hard IT * Rule of law								0.5822 (0.4576)	
Hard IT * Human rights									-0.3043 (0.1987)
Observations	1842	1172	1172	1172	1172	1172	1172	892	1161

Notes: Vector X variables in isolation (without interaction with inflation targeting) and controls are included but not reported for the sake of space. Robust standard errors are in brackets. *** p<0.01, ** p<0.05, * p<0.1

6 Transmission channels

As mentioned earlier, we assume that macroeconomic stability, i.e., the reduction in inflation and its volatility, interest rate, exchange rate, and output volatility, is the main channel through which the monetary framework may affect domestic investment. We adopt a simple two-step approach to test the main transmission channels. In Panel A of Table 6, we estimate simple Pearson's correlations in order to capture the relationship between the potential channels and domestic investment. Inflation, interest rate, real effective exchange (REER), and output volatility are negatively correlated with domestic investment. Moreover, the magnitude of the relationship extends from 13% to 20% depending on the nature of the volatility and is significant at the 1% threshold.¹⁵ If monetary policy credibility, leading to greater macroeconomic stability, is an important channel explaining our previous results, we should in turn observe a negative impact of inflation targeting on macroeconomic volatility. Results reported in Panel B suggest that inflation targeting reduces inflation and its volatility, real exchange rate, interest rate, and output volatility, in line with previous studies.

¹⁵We ensure that each variable is stationary and calculate volatility as the standard deviation of a three-year moving average of that variable in each country.

Table 6: Validity of transmission channels

Panel A								
	[1]	[2]	[3]	[4]	[5]			
	DI	DI	DI	DI	DI			
Inflation	-0.0278							
Inflation volatility		-0.1349***						
Interest rate volatility			-0.2063***					
REER volatility				-0.2050***				
Output volatility					-0.1734***			
Panel B								
	Nearest-Neighbors Matching		Radius Matching		Kernel Matching	Local Linear Regression		
	N=1	N=3	r=0.005	r=0.01	r=0.05			
[1] Inflation	-0.8972** (0.4573)	-0.9317** (0.4087)	-0.8721*** (0.3360)	-1.0323** (0.4273)	-1.1364*** (0.2835)	-1.3616*** (0.3283)	-1.3188*** (0.3648)	-1.4245*** (0.3896)
[2] Inflation volatility	-0.8948*** (0.2617)	-0.9130*** (0.2024)	-0.9923*** (0.1921)	-0.8413*** (0.1676)	-0.9288*** (0.1816)	-0.9006*** (0.1234)	-0.9176*** (0.1374)	-0.8848*** (0.1369)
[3] Interest rate volatility	-0.0194*** (0.0044)	-0.0210*** (0.0037)	-0.0218*** (0.0037)	-0.0194*** (0.0032)	-0.0211*** (0.0030)	-0.0200*** (0.0022)	-0.0203*** (0.0026)	-0.0196*** (0.0021)
[4] REER volatility	-6.1947*** (1.5673)	-6.7525*** (1.4017)	-7.2684*** (1.1303)	-6.3732*** (1.2976)	-6.8278*** (1.1364)	-6.6643*** (0.9716)	-6.7408*** (1.0322)	-6.5145*** (0.9001)
[5] Output volatility	-0.4155*** (0.1280)	-0.4883*** (0.1009)	-0.4823*** (0.0966)	-0.4757*** (0.0967)	-0.5106*** (0.0830)	-0.4922*** (0.0782)	-0.4971*** (0.0662)	-0.4896*** (0.0637)

Notes: This table reports the results of the main channels through which inflation targeting may affect domestic investment (DI). Columns [1]-[5] of Panel A present the relationship between different indicators of macroeconomic volatility and domestic investment, based on simple Pearson's correlations. *** indicates significance at the 1% threshold. Panel B reports the effect of inflation targeting on the potential channels, based on propensity score matching methods. The equation specified is the same as in the main model, replacing the dependent variable with the potential channel. Bootstrapped standard errors based on 100 replications are reported in brackets. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

7 Concluding remarks

A few studies have examined the impact of inflation targeting on private domestic investment, with mixed results. In this paper, we argue that a monetary framework such as inflation targeting, which strongly anchors public expectations, should promote monetary policy credibility and thus greater macroeconomic stability, creating a conducive environment for investment. Using a panel of 62 developing countries over the period 1990-2019, we rely on various propensity score matching methods to mitigate the potential selection bias associated with policy adoption. Our results are twofold. On the one hand, we find that inflation targeting significantly increases domestic investment. The effects are economically significant and robust to various tests. On the other hand, the monetary regime is less effective when the central bank tends to deviate from its target, and exhibits pronounced ineffectiveness in cases of extreme deviations. Moreover, there is evidence that inflation targeting is more effective in countries with sound fiscal discipline and that it benefits emerging economies the most. Regarding the main transmission channels, we find that enhanced credibility resulting from inflation targeting adoption, leading to greater macroeconomic stability, is an important channel through which the monetary framework promotes domestic investment.

Our findings have clear implications. A credible monetary framework such as inflation targeting, which strongly anchors public expectations, can be an important strategy to foster private investment in developing countries. However, since inflation deviations from the target are costly for investment, the central banks of the countries concerned should further improve their communication strategies in order to anchor public expectations more strongly, as these expectations can be a significant source of economic fluctuations (Baranowski et al., 2021). Finally, our results should be interpreted with caution. Although inflation targeting can be an effective framework for increasing domestic investment in developing countries, there are many other constraints to accelerating investment and growth. For instance, Aman et al. (2022) show that countries with better institutional quality benefit from lower exchange rate misalignment following an inflation targeting policy intervention and that their external competitiveness improves.

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Appendix A Additional checks

A.1 Assessing the quality of the matching method

Propensity score matching should eliminate significant differences in observables between inflation-targeting and non-targeting countries. First, we test the quality of the matching based on the Pseudo- R^2 , as suggested by [Sianesi \(2004\)](#). According to [Caliendo and Kopeinig \(2008\)](#), a good fit is associated with a «fairly low» Pseudo- R^2 , defined as the difference between the Pseudo- R^2 for the matched and for the unmatched samples. All the Pseudo- R^2 in our main estimates are less than 0.01 (see Table 4 of the manuscript), suggesting that the matching provided balanced scores. Consequently, our findings are robust regarding the hypothesis of common support. Second, we verify the Conditional Independence Assumption (CIA) for both observables and non-observables. Regarding observables, the standardized bias test which evaluates the mean difference in observables between inflation-targeting and non-inflation-targeting countries supports the absence of significant statistical differences between the two groups after matching (see [Rosenbaum, 2002](#)). Regarding unobservables, we test to what extent those that simultaneously affect the assignment to the treatment and the outcome variable could bias our results. The cutting points from Rosenbaum’s sensitivity tests at the 1% significance threshold hover between 1.9 and 3.8 (see Table 4 of the manuscript), comparable with existing studies for which the cutting point ranges between 1.1 and 2.2 (see e.g., [Aakvik, 2001](#) or [Rosenbaum, 2002](#) page 188). Thus, we can conclude that our main estimates are also robust regarding the CIA.

A.2 Additional controls

We discuss the rationale for the additional controls used for robustness in the paper. These variables include lagged unemployment rate, lagged primary budget balance, lagged public debt, lagged public investment, lagged foreign direct investment (FDI), central bank independence (proxied by the variable “Governor turnover”, which is a dummy equal to 1 if the central bank governor is changed informally before the end of his or her term, and zero otherwise), and government stability.¹⁶ The unemployment rate may influence the conduct of the inflation targeting policy due to a potential time inconsistency dilemma. On the one hand, in the presence of high unemployment, the central bank may not focus exclusively on price stability. Considering that it cannot ignore the labor market situation, it may adopt an accommodating policy, which may decrease the probability of adopting inflation targeting. On the other hand, countries with high unemployment could adopt the policy in the hope of improving the labor market situation, given the beneficial externalities of inflation targeting. Regarding fiscal discipline, referring to the unpleasant monetarist arithmetic ([Sargent et al., 1981](#)), one can consider that sound fiscal discipline may decrease the government’s likelihood of pressuring the central bank to finance its deficits, thereby increasing the central bank’s likelihood of adopting inflation targeting. Conversely, given the positive effect of this monetary framework on fiscal discipline, poor fiscal discipline may also lead the central bank to adopt inflation targeting to promote fiscal discipline. FDI could boost tax revenue collection by expanding the tax base through the entry of new firms, thereby increasing fiscal space. Therefore, FDI should be positively correlated with inflation targeting adoption. Regular and unofficial changes of the central bank’s governor may reflect a monetary institution’s lack of independence from the government and, therefore, the central bank’s incapacity to implement a credible targeting policy. Thus, the variable “Governor turnover” should reduce the likelihood of the central bank’s adoption of inflation targeting. Finally, a stable government, characterized by low political risk, may reflect good governance, strengthen investor confidence, and reduce sovereign bond yield spreads. Government stability also improves sovereign debt ratings and promotes access to financial markets for developing countries

¹⁶Since inflation targeting can have a strong influence on unemployment, FDI, or fiscal variables (see [Lucotte, 2012](#); [Minea and Tapsoba, 2014](#); [Huang and Yeh, 2014](#)), we lag these variables by one period to avoid a simultaneity bias.

(Sawadogo, 2020). Therefore, government stability should promote sound fiscal discipline and increase the likelihood that it will adopt inflation targeting.

A.3 Excluding pre-treated observations

The treatment (inflation targeting) consists of a country-year dimension, as is common in the literature, since our sample includes a time dimension. Therefore, in our sample, observations for a country that is not yet treated (but will be) are included in the control group. This explains why, with 23 inflation-targeting countries and a sample spanning from 1990 to 2019 (30 years), we do not have 690 observations (23×30) in the treated group, but rather 251. That said, this approach may match some observations for certain treated countries to these same countries at a time when the country is not treated. In Panel A of Table A1, we replicate our baseline model by excluding from the sample, observations for a country that is not yet treated but will be (i.e., pre-treated observations). Results remain stable.

A.4 Falsification tests

Since the adoption of inflation targeting may be associated with other alternative measures, one can expect that unobservables correlated with policy adoption and potentially with the outcome variable may drive our results. Therefore, in column [1] of Panel B (Table A1), we perform random assignments to treatment within the inflation-targeting countries, using fake adoption dates. In column [2], assignments are made within the entire sample. If our previous estimations from true adoption dates are biased by omitted variables or a spurious trend, the placebo regressions could also show significant effects. Instead, random assignments to treatment have no significant effect on the outcome variable, which strongly supports our findings.

A.5 Alternative definition of the treatment variable

Next, we analyze the sensitivity of our main results using an alternative definition of the treatment variable, referring to default start dates or informal/soft inflation target-

Table A1: Excluding pre-treated observations (Panel A), and falsification tests (Panel B)

Panel A	Nearest-Neighbors Matching		Radius Matching			Kernel Matching	Local Linear Regression
	N=1	N=3	r=0.005	r=0.01	r=0.05		
Treatment: Hard inflation targeting	3.1258*** (0.7723)	2.9798*** (0.6864)	3.3338*** (0.6388)	2.9171*** (0.5645)	2.9703*** (0.5363)	2.9990*** (0.5226)	2.8852*** (0.5211)
Panel B	Nearest-Neighbors Matching		Radius Matching			Kernel Matching	Local Linear Regression
	N=1	N=3	r=0.005	r=0.01	r=0.05		
Treatment: Hard inflation targeting							
[1] ATT	0.5469 (0.5982)	0.3272 (0.5390)	0.4516 (0.4328)	0.3783 (0.4022)	0.4531 (0.3700)	0.4605 (0.4183)	0.4626 (0.4131)
[2] ATT	-0.0725 (0.5637)	-0.2824 (0.5116)	-0.0709 (0.3301)	-0.0491 (0.2877)	-0.1985 (0.3478)	-0.1889 (0.3203)	-0.0039 (0.3008)

Notes: This table reports estimates of the effect of inflation targeting on domestic investment from propensity score matching. The treatment variable is a dummy equal to 1 if a country i in the year t has an inflation target, and zero otherwise, referring to conservative dates. The dependent variable is measured as the share of private-sector gross fixed capital formation to GDP. In Panel A, we exclude observations for a country that is not yet treated but will be (i.e., pre-treated observations) from the sample. Panel B reports placebo test estimates of the effect of inflation targeting on domestic investment. In column [1], we assign random adoption dates within treated countries. In column [2], we assign random adoption dates within the entire sample. Bootstrapped standard errors based on 500 replications are reported in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

ing. Under a soft inflation targeting framework, the central bank’s reaction to a deviation from the inflation target is slower than its reaction under a hard inflation targeting regime. Soft inflation targeting, therefore, refers to the date of adoption declared by the central bank itself, while hard inflation targeting refers to the date declared by academics. Examining the difference between soft and hard inflation targeting would make it possible to consider the central bank’s credibility, captured here by inflation deviations from the target. In other words, since the central bank’s reaction to an inflation deviation from the target is slower in a soft inflation targeting regime than in a hard inflation targeting regime, one would expect relatively smaller effects on investment in the former case. New average treatment effects from the baseline model reported in Table A2 are positive and significant, with a magnitude ranging from 2.47 (Radius Matching) to 3.52 (Nearest-Neighbors Matching) percentage points. Therefore, our results support the hypothesis of a positive and significant effect of inflation targeting on domestic investment, with a comparable magnitude whether we refer to hard or soft inflation targeting.

A.6 Alternative estimation methods

We perform some econometric robustness checks, using three alternative estimation strategies: the bias-corrected matching estimator, the Inverse Probability Weighting (IPW) es-

Table A2: The effect of inflation targeting on private domestic investment in %GDP
(using default starting dates or soft inflation targeting)

Treatment: Soft inflation targeting	Nearest-Neighbors Matching		Radius Matching			Kernel Matching	Local Linear Regression
	N=1	N=3	r=0.005	r=0.01	r=0.05		
ATT:	3.5246*** (0.6939)	2.4738*** (0.5962)	2.9087*** (0.5492)	2.5747*** (0.5051)	2.7750*** (0.4465)	2.7525*** (0.4586)	2.5911*** (0.4607)
Treated observations	251	251	251	251	251	251	251
Control observations	921	921	921	921	921	921	921
Total observations	1,172	1,172	1,172	1,172	1,172	1,172	1,172
Quality of the matching							
Pseudo R ²	0.013	0.009	0.005	0.006	0.006	0.005	0.008
Rosenbaum bounds sensitivity tests	2.3	1.7	3.1	3.3	3.8	3.8	3.3
Standardized bias (p-value)	0.209	0.482	0.886	0.751	0.797	0.813	0.570

Notes: This table reports estimates of the effect of inflation targeting on domestic investment from propensity score matching, using the main equation. The treatment variable is a dummy equal to 1 if a country i in the year t has an inflation target, and zero otherwise, referring to default dates or soft inflation targeting. The dependent variable is measured as the share of private-sector gross fixed capital formation to GDP. Bootstrapped standard errors based on 500 replications are reported in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

timator, and a nonparametric kernel regression. The bias-corrected matching estimator is similar to the propensity score matching method. However, as argued by [Abadie and Imbens \(2006, 2011\)](#), when matching more than one continuous covariate (as in this study), the previously described matching estimator is not consistent, even in infinitely large samples ([Abadie and Imbens, 2006](#) and [Abadie and Imbens, 2011](#)). The bias-corrected matching estimator combines matching and regression, which reduces potential residual biases due to imbalances in the covariates ([Balima et al., 2021](#)). New estimates are reported in Panel A of Table [A3](#), considering one and two matched neighbors, respectively. In columns [1] and [2], we include year and country-fixed effects, to control for unobserved heterogeneity. Second, since inflation targeting has been adopted by a growing number of developing countries in recent decades, in the last two columns we augment our main equation by adding a trend to capture common long-term movements correlated with inflation targeting adoption and potentially with the outcome variable. New results reinforce our previous conclusions.

Second, although estimating average treatment effects from propensity score matching makes it possible to address the potential selection bias in policy adoption, this estimator may have limits, especially in the presence of a severe lack of data. Data imputation is sometimes considered in dealing with this problem. However, as pointed out by [Seaman and White \(2013\)](#), IPW can be effective as it allows for the correction of missing data

by restricting to complete cases, thus avoiding imputation. In addition, IPW may be preferable in our case, where units may have missing observations on several variables, rather than on just one or two (Seaman and White, 2013). New average treatment effects from the IPW estimator are reported in Panel B of Table A3. Results remain stable.

Finally, a substantial part of the literature on inflation targeting draws results from parametric PSM (see, among others, Lin and Ye, 2007; Lin and Ye, 2009; Lin, 2010; Lucotte, 2012; Minea and Tapsoba, 2014; Balima et al., 2017; Minea et al., 2021). Yet, model specification plays an essential role in having consistent PSM estimators. Model misspecification (which often occurs in parametric estimations) leads to inconsistent score estimates. Against this background, Ardakani et al. (2018) estimate the treatment effect of inflation targeting on macroeconomic variables using propensity score matching, adopting a single-index semiparametric method by accounting for the model misspecification of parametric propensity scores. Consequently, we extend our econometric robustness checks by re-estimating our main results from a nonparametric kernel regression, using the same covariates as in the baseline model with PSM. This estimator, which is quite simple technically, performs a local-linear kernel regression but makes no assumptions about the functional form of the relationship between the outcome and the covariates. Results reported in Panel C of Table A3 lead to comparable effects to all our estimates obtained so far.

A.7 Sample dependence

The choice of countries for the control group was rigorously based on previous studies (e.g., see Lin and Ye, 2009; Minea and Tapsoba, 2014). Specifically, we exclude from the control group both countries whose real GDP per capita is lower than that of the poorest treated country in the sample and those whose population is lower than that of the smallest treated country in the sample, to allow for good comparability between the two groups of countries. Sample dependency is a particularly important issue in the literature. Certainly, our sample includes a reasonably large number of 62 developing countries, which can be considered representative of the developing world. Nevertheless, we check whether some specific countries influence our baseline results. As a robustness check, we extend the previous (main) sample by including 24 additional developing countries

selected from data availability. Moreover, these cover the whole range of developing countries included in [Gong and Qian \(2022\)](#) who examine the effect of inflation targeting on financial crisis. Estimates reported in [Table A4](#) suggest that expanding the main sample to other developing countries does not affect our results, ruling out a potential bias due to sample dependency.¹⁷

The study has examined the inflation targeting effect on domestic investment, focusing on developing countries. Macroeconomic volatility is a fundamental concern for developing countries ([Loayza et al., 2007](#)), as they are generally the least able to contain large shocks to economic activity, given their vulnerability and low resilience. Hence, it seems relevant to examine to what extent these economies may benefit from the side effects of a price-stability-oriented monetary policy framework, such as inflation targeting. Nevertheless, one might wonder whether the results of this article also apply to developed countries. Evidence of the impact of inflation targeting on the inflation performance of developed countries is found in the literature. For example, [Ball and Sheridan \(2004\)](#), [Lin and Ye \(2007\)](#), [Walsh \(2009\)](#), [De Mendonça and e Souza \(2012\)](#), and [Samarina et al. \(2014\)](#) find that the policy has no significant effect on the inflation performance of developed countries. Furthermore, as in this study, [Lin and Ye \(2007\)](#) found it interesting to focus mainly on emerging market and transition economies that have adopted inflation targeting, as their economic and social structures are very different from those of industrial countries. Finally, regarding the impact of inflation targeting on domestic investment, very few studies have focused on developed countries. Against this background, applying the synthetic control method to a panel of developing and developed economies over the period 1984-2017, [McCloud \(2022\)](#) finds that inflation targeting adoption did not affect domestic investment in 21 out of 29 treated countries. Among developed countries, the author finds that domestic investment increased in Australia in the post-inflation targeting period.

¹⁷We expand the main sample by adding the following developing countries: Argentina; the Bahamas; Bahrain; Botswana; Brunei Darussalam; Central African Republic; Congo, Rep; Gabon; Gambia; Guinea-Bissau; Guyana; India; Jamaica; Kuwait; Libya; Mauritius; Niger; Panama; Qatar; Suriname; Syrian Arab Republic; Venezuela; Yemen, Rep.; and Zimbabwe.

Table A3: The effect of inflation targeting on private domestic investment (%GDP):
Alternative estimation methods

Panel A: Bias-corrected matching	[1]	[2]	[3]	[4]
	$n = 1$	$n = 2$	$n = 1$	$n = 2$
Hard inflation targeting - ATT :	2.9081*** (0.2713)	3.1334*** (0.2487)	3.0779*** (0.4006)	3.1345*** (0.3506)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Trend	No	No	Yes	Yes
Panel B: Inverse Probability Weighting				[1]
Hard inflation targeting - ATT:				2.6378 *** (0.5564)
Panel C: Nonparametric kernel regression				[1]
Hard inflation targeting - ATT:				2.8248*** (0.3239)

Notes: This table reports estimates of the effect of inflation targeting on domestic investment from a bias-corrected matching estimator (Panel A), the Inverse Probability Weighting estimator (Panel B), and a nonparametric kernel regression (Panel C). Columns [1] and [2] of Panel A consider 1 and 2 matched neighbors, respectively. Standard errors are in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table A4: The effect of inflation targeting on private domestic investment: Sample dependence

	Nearest-Neighbors Matching		Radius Matching			Kernel Matching	Local Linear Regression
	N=1	N=3	r=0.005	r=0.01	r=0.05		
Hard inflation targeting	1.9047*** (0.7031)	3.2382*** (0.5755)	3.3084*** (0.4900)	3.2473*** (0.5087)	3.3526*** (0.4654)	3.3737*** (0.4538)	3.2565*** (0.4653)

Notes: This table reports estimates of the effect of inflation targeting on domestic investment from propensity score matching. The dependent variable is measured as the share of private-sector gross fixed capital formation to GDP. The treatment variable is a dummy equal to 1 if a country i in the year t has an inflation target, and zero otherwise, referring to hard inflation targeting. We expand the main sample by adding the following developing countries: Argentina; the Bahamas; Bahrain; Botswana; Brunei Darussalam; Central African Republic; Congo, Rep; Gabon; Gambia; Guinea-Bissau; Guyana; India; Jamaica; Kuwait; Libya; Mauritius; Niger; Panama; Qatar; Suriname; Syrian Arab Republic; Venezuela; Yemen, Rep.; and Zimbabwe. Bootstrapped standard errors based on 500 replications are reported in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Appendix B Sample

Table B1: List of countries

Inflation-targeting (IT) countries			
	Soft IT (default starting dates)	Full-fledged IT (conservative dates)	Average inflation deviations from the target (%)
Brazil	June 1999	June 1999	0.78
Chile	January 1991	August 1999	2.04
Colombia	September 1999	October 1999	1.64
Dominican Republic	2011	2012	-0.44
Ghana	January 2007	January 2007	2.89
Guatemala	January 2005	January 2005	0.09
Hungary	June 2001	August 2001	0.65
Indonesia	July 2005	July 2005	1.00
Kazakhstan	August 2015	August 2015	3.98
Mexico	January 1999	January 2001	1.35
Paraguay	May 2011	May 2011	-0.37
Peru	January 2002	January 2002	0.28
Philippines	January 2002	January 2002	-0.04
Poland	September 1998	September 1998	0.65
Romania	August 2005	August 2005	0.71
Russia	2014	2015	2.91
Serbia	September 2006	September 2006	-0.08
South Africa	February 2000	February 2000	0.25
Thailand	May 2000	May 2000	0.18
Turkey	January 2006	January 2006	2.20
Uganda	June 2011	June 2011	1.42
Ukraine	2015	2017	14.18
Uruguay	2002	2007	1.94
			Average (1990-2019): 1.18
Non-inflation-targeting countries			
Algeria	Bangladesh	Nicaragua	Belarus
Bolivia	Bulgaria	Burkina Faso	Cameroon
China	Costa Rica	Croatia	Ivory Coast
Ecuador	Egypt	El Salvador	Honduras
Iran	Jordan	Kenya	Madagascar
Malaysia	Morocco	Nigeria	Pakistan
Saudi Arabia	Sudan	Sri Lanka	Tanzania
Togo	Tunisia	Vietnam	Zambia
Senegal	Guinea	Haiti	Mali
Lao P.D.R	Myanmar	Ethiopia	

Notes: Data on adoption dates are taken from [Rose \(2007\)](#); [Roger \(2010\)](#); [Jahan \(2012\)](#) and central bank websites. We compute inflation deviations from the target as the difference between realized inflation and the inflation target for each treated country over the period 1990-2019. Data on inflation targets are extracted from [Jahan \(2012\)](#) and publications by the central bank of each country.

Table B2: Country classification

Emerging economies:	Algeria	Belarus	Brazil	Chile	China	Colombia
	Croatia	Dominican Republic	Ecuador	Egypt, Arab Rep.	Hungary	Indonesia
	Kazakhstan	Malaysia	Mexico	Morocco	Pakistan	Peru
	Poland	Romania	Russian Federation	Saudi Arabia	South Africa	Sri Lanka
	Turkey	Ukraine	Uruguay			Thailand
Low-income economies:	Bangladesh	Bolivia	Bulgaria	Burkina Faso	Cameroon	Costa Rica
	Cote d'Ivoire	El Salvador	Ethiopia	Ghana	Guatemala	Guinea
	Honduras	Jordan	Kenya	Lao PDR	Madagascar	Mali
	Nicaragua	Nigeria	Paraguay	Senegal	Serbia	Sudan
	Togo	Tunisia	Uganda	Vietnam	Zambia	Tanzania

Source: IMF Fiscal Monitor database.