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The Role of Inflation Targeting in Debt Denomination in Developing Countries

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Abstract

This paper analyzes the inflation targeting experience of developing countries as an effective monetary policy framework to promote changes in the currency composition of their international debt. Using matching with difference-in-differences to address the self-selection bias, we find that inflation targeting has led to a 3-6 percentage point reduction in the foreign currency share of international debt in targeting countries when compared to non-targeting countries. Furthermore, from the analysis of the individual currency shares, we find that inflation targeting has contributed to a 10 percentage points lower US dollar share in international debt in targeting countries compared to non-targeting countries; while the effects on the euro and other foreign currencies shares are negligible. This not only provides evidence that the structural features of international financial markets matter, but also that monetary policy can help developing countries reduce their reliance on foreign currency debt.

JEL classification: F02, F34, F41, G15

Keywords: Inflation targeting, international debt, currency composition, developing countries.

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1 Introduction

In the last two decades, the world witnessed an unprecedented pace of global integration in financial markets, with improved access to capital markets providing considerable investment opportunities. At the same time, this integration has exposed developing countries to external shocks – such as sudden cessations of capital flows – that lead to more volatile exchange rates. In particular, balance sheet effects associated with liabilities denominated in foreign currency and assets denominated in local currency leave countries prone to financial crises.[1] The resulting economic and financial instability makes it harder for countries to issue debt denominated in local currency, further exacerbating currency mismatches which can magnify the effects of adverse shocks, reducing the capacity of agents to borrow from abroad.[2] This vicious cycle was first introduced by Eichengreen et al. (2002) and Hausmann & Panizza (2003) as the "original sin" hypothesis.

Although the original sin phenomenon has been viewed as universal among developing countries, a new trend emerged in the mid-2000s when countries such as Brazil, Mexico, and South Africa successfully issued local currency bonds in international markets.[3] This new trend raises questions regarding the original sin hypothesis. Can developing countries continue to denominate international debt in local currency, or is this a temporary development with the reliance on foreign currency impossible to overcome?

Until recently, most scholars agreed that the original sin phenomenon was due to the structural features of international financial markets, rather than the result of poor domestic policies. However, Burger et al. (2012) argue that enacting policies to improve macroeconomic stability and creditor rights supports the development of local currency bond markets, ultimately helping countries overcome the original sin. Therefore, stable inflation – due to a monetary policy framework such as inflation targeting – coupled with continuing economic growth can increase foreign investors' confidence and encourage lending in local currency.

Adopting inflation targeting typically implies that a central bank has an announced nu-

[1] See for instance, Schneider & Tornell (2004), Frankel (2005), or Aguiar (2005).

[2] Chang & Velasco (2016) discuss this in the context of conventional and unconventional monetary policy in emerging economies with financial frictions.

[3] Gruić & Wooldridge (2013) describe this emerging behavior.

merical target for inflation and a commitment to transparency and accountability in conducting monetary policy. Numerous studies have analyzed the effects of inflation targeting on macroeconomic performance. Most of the studies focusing on developing countries suggest that inflation targeting reduces inflation and its volatility, output volatility, interest and exchange rate volatility, and improves fiscal discipline.[4] As a result, central banks enjoy an improved credibility that helps mitigate the dynamic inconsistency problem often faced by developing countries.

Several theoretical papers have associated the lack of credible monetary policy with the original sin hypothesis. From a lender's perspective, countries will be charged a risk-premium if they are unwilling to commit to a credible monetary policy and choose to inflate away the real value of local currency debt. As Du et al. (2015) argue, countries with credible monetary policy can lower their local currency return premium, enabling them to issue the most local currency debt. Similarly, Engel & Park (2016) conclude that countries with less credible monetary policy tend to issue debt in foreign currency rather local currency since foreign currency offers them a higher borrowing limit. From a borrower's perspective, lack of commitment regarding monetary policy will discourage borrowers to issue debt in local currency. For example, Jeanne (2003) argues that in the case of uncertain monetary policy, borrowers may choose to dollarize their liabilities to minimize the probability of default, while Perez & Ottonello (2016) argue that governments will choose to issue debt in foreign currency as high levels of local currency debt may tempt them to engage in costly inflation. Consequently, in this article, we analyze the relationship between a disciplined monetary policy and the currency composition of international debt by demonstrating how inflation targeting developing countries have reduced their foreign currency shares in international debt compared to non-targeting developing countries.

Based on data from the Bank of International Settlements (BIS), in 1994 most developing countries issued nearly all of their international debt in foreign currency. Although foreign currency shares have declined since the early 2000s, the rate of decline has not been universal across countries. Separating developing countries into inflation targeters and non-targeters, we observe that by 2013 inflation targeting countries reduced their foreign currency share of international debt by 7 percentage points, compared to 4 percentage points in the non-targeting countries. Building on

[4]See for instance, Mishkin (2004), Rose (2007), Lin & Ye (2009), Lin (2010), and Minea & Tapsoba (2014).

these simple descriptive statistics, we argue that there is an unexplored relationship between the adoption of inflation targeting and the denomination of international debt. After all, once inflation is under control, denominating international debt in local currency should be a viable option for countries to diversify and reduce their exposure to exchange rate fluctuations.

Since inflation targeting is often introduced following a crisis, or after the failure of other monetary strategies to stabilize prices, the adoption of inflation targeting is not fully exogenous. To address this problem, recent studies have employed a variety of empirical strategies. For instance, Batini et al. (2007), Mishkin & Schmidt-Hebbel (2007), and Gonçalves & Salles (2008) employ a difference-in-differences strategy to analyze the impact of inflation targeting on the inflation rate. However, the decision of a country to implement an inflation targeting policy is not random, and these studies are unable to control for all unobservable characteristics (such as the strategic behavior of central banks) leading to an endogeneity problem. To overcome this issue of self-selection, other studies have employed matching strategies to carefully construct appropriate control groups. Vega & Winkelried (2005), Lin & Ye (2007), Lin & Ye (2009), Lin (2010), Flood & Rose (2010), Frappa & Mésonnier (2010), and Minea & Tapsoba (2014) use propensity score matching to analyze the average treatment effect of inflation targeting on macroeconomic variables such as the level and volatility of inflation, exchange rate regime, international reserves, fiscal performance, output volatility, and business cycle synchronization. Nonetheless, these matching estimators can be deemed weak due to their heavy reliance on a strict "selection on observables" assumption. Therefore, in our empirical analysis of 75 developing countries from 1994-2013, we address the self-selection bias associated with the adoption of inflation targeting by combining a difference-in-differences strategy with a variety of propensity score matching methods; this allows us to control both observable and unobservable characteristics.

In this article we provide the following contributions to the literature. First, we empirically analyze the effect of inflation targeting on the foreign currency share of international debt. We find supporting evidence that the adoption of inflation targeting has led to a reduction in the foreign currency share of international debt by an average of 3 percentage points compared to non-targeting countries. Given that the implementation of inflation targeting in developing countries is relatively new, we expect to see an even bigger impact going forward as existing long-term debt matures.

Furthermore, as Mishkin (2004) discusses, the benefits of adopting inflation targeting might not materialize immediately, because monetary authorities need time to establish credibility in order to fully achieve their long-term targets. Thus, when we restrict our sample of inflation targeting countries to those with an unchanged target or target range, the effect of adopting inflation targeting increases to an average of 6 percentage points compared to non-targeting countries. Second, we extend the discussion on the original sin hypothesis by incorporating the effect of monetary policy. In particular, we provide evidence that not only do the structural features of global financial markets matter, but a monetary policy framework such as inflation targeting can have a significant effect on the alleviation of original sin.

Third, we analyze the reliance on foreign currency not only at the aggregate level, but at the individual level as well. This allows us to distinguish between changes attributable to specific currencies in international debt markets. To the best of our knowledge, our paper is the first to analyze the effect of inflation targeting on the currency composition of international debt. Looking at individual currencies, we find that inflation targeting developing countries had a US dollar share of international debt 10 percentage points lower than non-targeting countries, while the effects on the euro and other foreign currencies shares appear negligible. This finding has significant policy implications. Specifically, the expansion of dollar denominated international debt following the Federal Reserve's large-scale bond purchasing program has transmitted US monetary easing to developing countries. Additionally, the increase in the dollar share of international debt in non-targeting countries can have potential consequences for these countries' financial stability in the future, emphasizing the importance of policy-oriented solutions in reducing developing countries' reliance on foreign currency debt.

The article is organized as follows: Section 2 describes the dataset and methodology; Section 3 presents the main findings and robustness analyses; and Section 4 offers concluding remarks.

2 Empirical Analysis

2.1 Data Description

Our dataset consists of 75 developing countries examined from 1994 through 2013. By 2013, fifteen developing countries had formally adopted inflation targeting. This implies that the central banks of these countries have made an explicit announcement to pursue price stability as the primary objective of their monetary policy by adopting a quantitative target for inflation. The commitment to these policies assumes a high degree of transparency and central bank accountability for their performance in achieving the inflation objective. Table A1 provides a list of these countries and the years when inflation targeting was introduced. The dates used in our analysis come from Hammond (2012) and Roger (2010).

The adoption of inflation targeting could have a delayed effect since the potential benefits do not materialize immediately. To address the differential effect associated with this delay, we follow Ball & Sheridan (2004), Mishkin (2004), and Lin & Ye (2007) and define the start of constant or stationary inflation targeting as the first year in which a country had an unchanging target or target range for an indefinite period of time (until 2013). For example, while the inflation target has been constant since its inception in some countries – e.g., in Chile the inflation target has remained at 3% since 2001 – in other countries the initial inflation target was set at a higher level and meant to eventually converge to a lower level – e.g. in Brazil the inflation target was set at 8% in 1999 and lowered to 4.5% by 2005. As a result, Chile has had a constant inflation target since 2001, while Brazil has had a constant target since 2005. This more restrictive definition of inflation targeting enables us to deal with the potential differences between having a publicly announced specific target or target range and a situation in which a country is able to maintain a constant inflation target. According to this definition, twelve countries had a constant inflation target by 2013. Table A1 column (2) lists the years when inflation targeting countries began to maintain their constant inflation targets. Table A2 lists the remaining developing countries used for this analysis that did not adopt inflation targeting.

The data on international debt come from the BIS' *Debt Securities Statistics*. We focus

solely on *total* international debt, defined as debt issued outside the market of the issuing country by the general government, banks, other financial corporations, and non-financial corporations.[5] While debt can be issued domestically, as well as internationally, domestic debt can be subject to government interventions to influence pricing and the market formation of debt securities through regulatory controls or other arbitrary measures.[6] Using an individual country's reports of debt securities issued and amounts outstanding by residence and nationality of issuer, we construct the measure of $foreign\ currency\ share = 1 - \frac{local\ currency\ debt}{total\ international\ debt}$. The BIS reports data on debt securities distinguishing between securities issued in dollars, euros, other foreign currencies, and local currency.[7]

The majority of the other variables are drawn from the World Bank (WB) and International Monetary Fund (IMF) databases. Gross domestic product (GDP), private credit, and trade openness are taken from the WB's *World Development Indicators*. We use GDP rather than GDP per capita to capture the size effect of the country. As a measure of financial development we use total private credit over GDP. The sum of exports plus imports as a share of GDP is our measure for trade openness. Inflation and fiscal balance are taken from the IMF's *World Economic Outlook* and are measured as the average 12 month rate, and the difference between revenues and expenditures as a share of GDP, respectively. The world exports share measures the relative importance of a country in world trade, and is defined as the ratio of a country's exports to total world exports. This data come from the IMF's *Direction of Trade*.

The measure of financial openness is from Chinn & Ito (2006). It is based on information regarding regulatory restrictions on cross-border capital transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). Specifically, it is the first standardized principal component of the variables that indicate the presence of multiple exchange rates, restrictions on current account and capital account transactions, and the requirement for the surrender of export proceeds. The measure of exchange rate flexibility is the de facto exchange rate regime classification by Reinhart & Rogoff (2004) extended by Reinhart & Rogoff

[5] In most developing countries issuance by banks and other financial corportations has traditionally been limited.

[6] Moreover, the BIS does not currently have publicly available data on the currency composition of domestic debt.

[7] The BIS provides data on only two major currencies: dollars and euros (including legacy currencies). All other currencies are aggregated into the "other foreign currencies" group. Therefore, we report the results separately for dollars, euros, and other foreign currencies shares.

(2009).

Finally, to capture the level of institutional quality, we include a set of variables that measure different aspects of institutional development. These variables include: democratic accountability, ethnic tensions, religious tensions, law and order, military in politics, corruption, external conflict, internal conflict, government stability, and socioeconomic conditions. These all are taken from the *International Country Risk Guide* (ICRG) compiled by the Political Risk Services Group. Table A3 details the definitions and sources of the variables used in the empirical analysis.

2.2 Descriptive Statistics

To observe the evolution of the foreign currency share in international debt over time, Figure 1 plots the foreign currency shares for three groups of countries: all inflation targeting countries, constant inflation targeting countries, and non-targeting countries. Up until the early 2000s, inflation targeting and non-targeting countries had their foreign currency shares around 99%. Although all three foreign currency shares have experienced a decline since then, the gap between targeters and non-targeters has widened. As is evident from Figure 1, countries that adopted inflation targeting show systematically lower shares of foreign currency in their international debt, with the constant inflation targeting countries exhibiting the largest decrease, reaching 89% by 2012. Thailand, for example, which introduced inflation targeting in 2000 and reached their constant inflation target in 2009, reduced their foreign currency share in international debt to 73%. On the other hand, non-targeting countries show the smallest decrease, with their foreign currency share falling to 95% by 2010, only to rise to 96% by 2013. All in all, between 1994 and 2013 the declines in the foreign currency shares for inflation targeting countries, constant inflation targeting countries, and non-targeting countries constitute 5.2, 8.2, and 3.1 percentage points, respectively.

The data from the BIS allow us to compute the foreign currency shares in international debt by distinguishing between what was issued in local currency from the total international debt. However, this number can potentially obscure important features, as it aggregates all the debts issued in foreign currencies. To further analyze the decline of the total foreign currency share in inflation targeting countries observed in Figure 1, we decompose the total international debt into

dollars, euros, other foreign currencies, and local currency.

Figure 2 presents the composition of international debt for inflation targeting countries (Panel A) and for non-inflation targeting countries (Panel B) in 1994 and 2013. It is evident that the largest share of debt issued by developing countries is denominated in dollars which accounts for around 80% of total international debt for both inflation targeting and non-targeting countries. However, in comparison to other currency shares the dollar share exhibited the largest change from 1994 to 2013. While inflation targeting countries decreased their dollar share by almost 2 percentage points, non-targeting countries increased their dollar share by 10 percentage points. This increase in the dollar share is not surprising. The European Central Bank (ECB (2014)) presents evidence of the continuous growth of dollar denominated international debt in emerging markets. Therefore, the dollar credit expansion observed after the financial crisis can explain the increased dollar share in the composition of international debt in non-targeting countries.

Regarding the other currency shares, both targeting and non-targeting countries decreased their other foreign currencies shares, keeping the euro shares stable. In conclusion, the shares of debt across all currencies are more volatile in countries that do not target inflation; i.e., non-targeting countries experienced a greater change in their currency composition of international debt compared to inflation targeting countries.

2.3 Estimation Strategy

As presented in Figure 1, both inflation targeting and non-targeting countries exhibit a downward trend in their foreign currency shares in international debt. Consequently, it would be misleading to estimate the effect of inflation targeting on the foreign currency shares by simply comparing the shares of foreign currency before and after the adoption of the inflation targeting. To avoid overestimating the effect of the policy, we use the non-inflation targeting countries as a control group to estimate the counterfactual outcome in order to account for secular trends, and to separate the

effect of the policy (treatment). We estimate the following baseline specification:

$$y_{i,t} = \alpha_i + \gamma_t + \beta \cdot \ treatement_i \cdot after_{i,t} + \delta \cdot X_{i,t} + \epsilon_{i,t} \tag{1}$$

$$= \alpha_i + \gamma_t + \beta \cdot IT_{i,t} + \delta \cdot X_{i,t} + \epsilon_{i,t} \tag{2}$$

where $y_{i,t}$ is a measure of foreign currency share in international debt, α_i is a country fixed effect to capture all time-invariant country-specific factors that affect the outcome, and γ_t is the time dummy to account for shocks that similarly affect both inflation targeting and non-targeting countries. $treatment_i$ is a binary variable indicating whether country i adopted inflation targeting, and $after_{i,t}$ is a dummy indicating the time of the inflation targeting adoption for each inflation targeting country i. The product of these two variables, $IT_{i,t}$, equals to 1 if country i in year t was targeting inflation and zero otherwise. $X_{i,t}$ is a vector of time-varying control variables, such as GDP, inflation, trade openness, share of world exports, international debt to GDP ratio, financial development, exchange rate regime, capital account openness, fiscal balance, and the quality of institutions. $\epsilon_{i,t}$ is the usual error term assumed to be uncorrelated with $IT_{i,t}$. The choice of control variables relies mainly on the determinants of the original sin from Eichengreen et al. (2002) and Hausmann & Panizza (2003). We add capital account openness to capture the effect of international investor demand access. Finally, following Burger & Warnock (2006) and Burger et al. (2012), we include a variety of measures for institutional quality to capture the effect of laws and regulations on the share of foreign currency in international debt.

If the adoption of inflation targeting was determined by observable factors, then these control variables should be enough to identify the effect of inflation targeting on the foreign currency share in international debt. However, some of the relevant factors are unobservable (for instance, the strategic behavior of central banks, political decisions, etc.), and thus cannot be accounted for. Given the non-random selection of the policy adoption and our inability to control for all unobservable characteristics, Equation 1 can be affected by an endogeneity problem.

As a result, we could be facing a self-selection problem, since the decision of a country to implement inflation targeting could be correlated with a set of observable variables which also affect the outcome variable. This issue emphasizes the need for careful construction of a control group.

To achieve this objective we use the matching method developed by Heckman & Robb (1985) and Heckman et al. (1998) that pairs each treated observation with the most similar member of the control group on the basis of their observable characteristics. To determine the conditional probability (propensity score) of the adoption of inflation targeting, we use a probit model that includes the following variables: the lagged inflation rate, broad money growth, trade openness, fiscal balance, real GDP per capita growth, exchange rate regime, and a lagged measure of the outcome variable. As discussed in Svensson (2002) and Mishkin (2004), these variables define whether a country meets the necessary pre-conditions to begin an inflation targeting policy.

Using matching to estimate the treatment effect relies on the assumption that the selection into the inflation targeting framework depends only on the variables specified above; i.e., the "selection on observables" assumption. However, it is clear that there are many unobserved or unaccounted factors that can create systematic differences between the treatment and control groups, affecting the outcome variable. To address this issue, Blundell & Dias (2002), Arnold & Javorcik (2009), and Grg et al. (2008) suggest combining *matching with difference-in-differences*. This method estimates the conditional probability of treatment by using propensity score matching and incorporates it into a fixed-effects specification to control for both observable and unobservable characteristics.

Therefore, in our empirical analysis we employ two approaches that rely on matching with difference-in-differences. The first approach follows Blundell & Dias (2002) and restricts the difference-in-differences regression to observations with the common support – where the propensity scores of treated and control groups overlap. The second approach follows Rotnitzky & Robins (1995), Hirano & Imbens (2001), and Hirano et al. (2003) and consists of performing a fixed effects regression weighted by the inverse of the estimate of the propensity score. The main idea behind this methodology is to use the estimated propensity scores as weights in a regression of the outcome variable on the treatment indicator as specified in Equation 1. As Hirano & Imbens (2001) argue, it is preferable to combine matching procedures and weighting, rather than to rely solely on one of these methods to remove bias. In fact, given that weights are a function of the estimated propensity scores, they create a balance in the covariates across treated and control units in the probit regression, reducing the bias in the estimator of the effect of inflation targeting on our outcome

variable. Specifically, let $\hat{p}(x)$ be the estimated propensity score of adopting inflation targeting. Then, Hirano & Imbens (2001) propose using $1/\hat{p}(x)$ and $1/(1-\hat{p}(x))$ as the weights for the treated and control units respectively.

Consequently, we estimate three sets of regressions. The first regression is a simple difference-in-differences (fixed-effects) specification presented in Equation 1. We use this as our baseline case for the effect of inflation targeting on the foreign currency share of international debt. Second, we use the propensity scores generated by the probit regression and re-estimate Equation 1 under the common support, restricting observations to those where the propensity scores of the treatment and control groups overlap. Third, we use the propensity scores as the predicted probability of the adoption of inflation targeting to weight the treated and control units in the fixed-effects regression.

3 Estimation Results

3.1 Total Foreign Currency Share

Our main results are presented in Table 1, where the dependent variable is the foreign currency share of international debt. Column (1) presents the results from estimating Equation 1 using the baseline difference-in-differences specification. We find that the introduction of inflation targeting reduces the foreign currency share in international debt in developing countries by 3.2 percentage points compared to other developing countries that did not introduce inflation targeting. This result is statistically and economically significant.

Regarding other determinants of the foreign currency share of international debt, we find that country size, inflation rate, and capital account openness all play significant roles. As argued by Hausmann & Panizza (2003), small countries with less economies of scale will tend to rely more on foreign currency to denominate their international debt. We measure the size of the economy by its GDP and its share in world exports. While the point estimate for GDP is insignificant, the share in world exports is negative and strongly significant. This result suggests that the size effect in developing countries relies heavily on the trade channel. We also find a significant negative effect of inflation on the share of foreign currency. This is consistent with Claessens et al. (2007)

who argue that countries with high inflation do not need to issue large amounts of foreign debt, as the inflation tax is usually a major source of revenue. Finally, we find that higher capital account openness results in a significantly lower foreign currency share of international debt. This is to be expected since international investors can use the currency from a country with more open financial markets as an investment opportunity. Thus, the higher the degree of capital account openness, the more likely a country will issue debt in its local currency.

Columns (2) - (4) present the results of the estimation of Equation 1 using difference-in-differences over the common support defined by the matching procedure described in Section 2.3. Columns (5) - (7) present the results of using the inverse of the propensity scores as weights in the difference-in-differences estimation. In particular, columns (2) - (3) and (5) - (6) report the effect of inflation targeting using two nearest-neighbor matching estimators with $n = 1$ and $n = 3$, respectively, while columns (4) and (7) use a kernel matching estimator.[8] The results for the common support sample and the weighted regression are very similar to those from column (1). Specifically, we find that relative to the control group of non-inflation targeting developing countries, the implementation of inflation targeting reduces the foreign currency share of international debt between 2.5 to 3.4 percentage points.

In conclusion, our results confirm the previous findings that emphasize the importance of exogenous factors (such as size or trade) as determinants of the currency composition of international debt. However, we also find that endogenous policies, specifically inflation targeting, can help developing countries reduce their reliance on foreign currency in international debt.

3.2 Alternative Specifications

In this subsection we check the sensitivity of our results to alternative specifications. Table 2 reports the results using the same methodologies as in Table 1: column (1) is our baseline specification, columns (2) - (4) are the difference-in-differences over the common support determined by the matching procedures, and columns (5) - (7) use the inverse propensity scores as weights in the difference-in-differences estimation. Although Table 2 reports only the coefficients associated

[8] We also tried various radius matching estimators and obtained very similar results that we do not report but which are available upon request.

with the inflation targeting variable (coefficient β from Equation 1), all specifications include the covariates previously defined in Equation 1 and presented in Table 1. Table 2 is organized in the following manner: Panel A presents the results using the constant inflation targeting dates, Panels B and C present the results using additional variables in the probit specification while keeping the difference-in-differences specification unchanged, and Panels D and E present the results with additional controls in our difference-in-differences regression.

Ball & Sheridan (2004) and Mishkin (2004) argue that the effects of inflation targeting might be observed only some years after its implementation. If so, our results could be underestimating the effect of inflation targeting due to the timing of the policy. To address this potential concern, in Panel A we re-estimate the regressions from Table 1 using the constant inflation targeting dates. Results show that the effect of inflation targeting becomes stronger. In particular, the effect of an inflation targeting policy in developing countries that have achieved a constant or stationary inflation target reduces the foreign currency share of international debt between 5.7 to 6.7 percentage points compared to developing countries that did not implement the policy.

Svensson (2002) and Mishkin (2004), among others, discuss the prerequisites for the adoption of inflation targeting. Building on these prerequisites, Samarina & De Haan (2014) examine a list of variables that may influence countries' choice to target inflation. They group these determinants into five categories: macroeconomic, fiscal, external, financial, and institutional. Our main probit specification already controls for most of these pre-conditions. However, to account for financial and institutional factors, we expand the probit regressions by adding the government debt to GDP ratio and the five-year central bank governor turnover rate as an inverse proxy of central bank independence. Once these factors are accounted for, the results remain qualitatively and quantitatively similar to those from Table 1. In Panel B, where we include the government debt to GDP ratio in the probit specification, the effect of adopting inflation targeting in developing countries is negative and statistically significant, with an effect between 2.8 and 3.4 percentage points relative to non-targeting countries. Similarly, in Panel C, where we add the central bank governor's turnover rate, we find that the adoption of inflation targeting decreases the foreign currency share of international debt between 2.4 and 3.5 percentage points relative to non-targeting countries.

Finally, we check if our results are sensitive to the inclusion of additional covariates in

the difference-in-differences specification. First, from a balance sheet perspective, if a country has foreign currency denominated international debt, exchange rate movements will have aggregate wealth effects. Thus, a low exchange rate volatility can create the necessary incentives to increase foreign currency exposure, limiting the development of the local currency market. To capture this effect, we include the exchange rate volatility as an additional regressor in Equation 1. Panel D reports the results. After controlling for the exchange rate volatility, the adoption of inflation targeting reduces the foreign currency share of international debt between 2.8 and 3.4 percentage points compared to non-targeting countries. Second, international capital flows can also provide a direct source of influence on the currency composition of international debt. This effect can be captured by FDI flows, potentially determining the currency denomination of investment and playing a key role in the choice of the denomination of liabilities and international debt. Panel E from Table 2 reports the inflation targeting coefficient estimates. The results remain strongly significant and robust. After controlling for the level of FDI, the adoption of inflation targeting reduces the foreign currency share of international debt between 2.5 and 3.4 percentage points compared to non-inflation targeting developing countries.

3.3 Individual Currencies

The empirical literature on the currency composition of international debt mostly concentrates on the analysis of foreign currency aggregates.[9] However, over the years, many scholars have shown that the dynamics of aggregate variables can be different from the dynamics of micro variables.[10] Therefore, understanding the behavior of individual foreign currencies in the denomination of international debt – rather than the aggregate share of foreign currency – can provide additional insights into our study. This is particularly relevant given that the two main currencies in international debt denomination – the dollar and euro – have followed opposite trends almost since the euro's inception.[11] Furthermore, as far as we are aware, our study is one of the first to look into individual currencies in international debt. Using a different dataset from the BIS, Cohen (2005) might be one of the first scholars to discuss international debt at the individual currency level, and more

[9] See Hausmann & Panizza (2003), Eichengreen et al. (2002), and Claessens et al. (2007) among others.

[10] For example, Abadir & Talmain (2002), Pesaran (2003), and Hsiao et al. (2005)

[11] See for instance Chinn & Frankel (2008) where they analyze the rise of the euro as a new currency and its potential to rival the dollar.

recently, Ito & Rodriguez (2015) use the newly available BIS data to analyze the determinants of the use of individual currencies for debt denomination.

Using the same methodology as in Section 3.1, we revisit our analysis of the individual currency shares in total international debt. Thus, we redefine Equation 1 substituting the (aggregate) foreign currency share with (i) *the dollar share*, (ii) *the euro share*, and (iii) the remaining *other foreign currencies share* in international debt. Tables 3, 4, and 5 present the results for the dollar, the euro, and the other foreign currencies shares, respectively. All three tables have a similar layout. They all report only inflation targeting coefficient (β) associated with the effect of adopting the policy. In each table, Panel A provides the results of the baseline specification of Equation 1 for their respective individual currency shares. Panels B and C add the government debt to GDP ratio and five-year central bank governor turnover rate to the probit estimates of the propensity scores. Panels D and E check the sensitivity of the results by including the exchange rate volatility and the level of FDI as additional controls in the difference-in-differences specification.

Panel A from Table 3 shows that for the baseline specification, the implementation of inflation targeting results in a significantly lower dollar share of international debt, an average of 9.0 percentage points lower in targeting countries, relative to non-inflation targeting countries. When we incorporate the government debt to GDP ratio (Panel B) or the five-year central bank governor turnover rate (Panel C) as additional regressors in the probit model the results remain similar, confirming a lower dollar share of international debt (7.6 to 10.3 percentage points) compared to non-targeting countries. Finally, when we check the sensitivity of our specification by including exchange rate volatility and FDI in Equation 1 – Panels D and E – the results hold and are quantitatively similar to those of our baseline regression.

Our interpretation of the results for the dollar share is as follows. Since 2008, the Federal Reserve – via large-scale asset purchase policies – has injected more than $4 trillion to aid the financial markets after the recession. These unconventional monetary policies, also known as quantitative easing, increased credit availability in the lending markets and put downward pressure on interest rates. As a result, by the end of 2013 the vast majority of government bonds traded at yields below 1% with some even yielding less than 0%. Such low yields were the goal of the

Federal Reserve's unconventional monetary policy.[12] Consequently, McCauley et al. (2015) relate the expansion of dollar denominated bonds to the compression of US Treasury bond yields. This persuaded investors to purchase the bonds of borrowers outside the US (many rated BBB) which offered a better spread relative to the low-yielding US treasury bonds.

At the same time, Du et al. (2015) argue that countries with a credible commitment device can reduce their local currency return premium.[13] This reduction can be achieved by committing to an inflation path – by adopting inflation targeting, for instance – that will keep local currency debt payouts relatively stable. Thus, while borrowing in dollars became cheaper due to the combination of low interest rates and increased liquidity, inflation targeting countries, benefiting from a low local currency return premium, managed to maintain their dollar share of international debt compared to non-inflation targeting countries which expanded their reliance on the dollar.

The analyses for the euro and the other foreign currencies shares in international debt tell quite a different story. Tables 4 and 5 present the point estimates for the effect of inflation targeting on the euro share and the other foreign currencies share respectively. We find no significant effect for any of the specifications and methodologies employed. It is not surprising that we do not find a significant effect on the euro share. First of all, as evident from Figure 2, both inflation targeting and non-targeting countries kept the euro shares of their international debt relatively constant. Second, other factors might be at work with the introduction of the new currency. For example, developing countries could have initially switched to the euro in order to diversify, but returned to the dollar following the financial crisis. As reported in ECB (2014), the issuance of euro denominated debt has declined since 2008.

A note of caution is needed for the interpretation of the other foreign currencies shares results. In the Descriptive Statistics section (Figure 2) we reported a reduction in the other foreign currencies shares for both inflation targeting and non-targeting countries, however, we find no statistically significant effect of inflation targeting on the reduction of the other foreign currencies share. We explain the lack of a significant relationship by pointing out that our measure of other foreign currencies share bundles many currencies, possibly masking the individual effects of cur-

[12] Gagnon et al. (2011).

[13] Specifically, their framework emphasizes the importance of borrowing from risk-averse lenders.

rencies like the Japanese yen, the British pound, and the Swiss franc. Unfortunately, the BIS does not report individual currency information on the denomination of international securities.

The foreign currency credit expansion observed after the financial crisis can have significant implications for the future financial stability of developing countries, as over-reliance on foreign currency credit can lead to crises. Therefore, the stark difference in the composition of international debt between targeting and non-targeting countries, with the recent expansion of dollar denominated debt observed among non-targeting countries, further emphasizes the need for policies that reduce the reliance of developing countries on foreign currency debt.

4 Concluding Remarks

Previous studies concentrate on the effect of inflation targeting on macroeconomic performance without explicitly addressing the potential benefits to investor confidence that would result from the reduction of uncertainty. As price stability is attained, denominating international debt in local currency should be a viable option. Therefore, in this paper, we analyze the effect of the adoption of inflation targeting as a monetary policy framework to reduce the reliance on foreign currency and influence the currency composition of international debt.

Our empirical analysis addresses the self-selection bias associated with the adoption of inflation targeting, controlling for observable and unobservable characteristics by combining a difference-in-differences strategy with a variety of propensity score matching methods. We find supporting evidence that the adoption of inflation targeting has led to a reduction in the foreign currency share of international debt by 3 to 6 percentage points compared to non-targeting countries. For individual currencies, we find that inflation targeting has contributed to a 10 percentage points lower dollar share of international debt in targeting countries compared to non-targeting countries; while the effect on the euro and other foreign currencies shares is negligible. Our results are statistically significant and robust to alternative specifications of the propensity score matching as well as the inclusion of other control variables in the baseline specification. However, additional data – probably at the individual security level – might be needed to fully understand the nature and behavior of the dollar and euro denominated international debt.

While not at odds with previous research, our findings extend the discussion on the nature of the original sin. On the one hand, our results reinforce that the exogenous factors of financial markets are important determinants of the original sin. On the other hand, we highlight the importance of monetary policy – inflation targeting – as an effective mechanism for developing countries to systematically reduce their foreign currency reliance in international debt.

Thus, our findings contribute to the discussion on the benefits of adopting inflation targeting in developing countries. Since in this paper we highlight the effect of inflation targeting on the denomination of total international debt, a natural extension would be to study its effects on the currency choice of the issuers. In fact, future research is still required to fully understand how adopting inflation targeting can affect the currency composition of the international debt of individual national issuers such as banks, other financial corporations, non financial corporations, and the general government.

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Figure 1: Share of Foreign Currency in International Debt

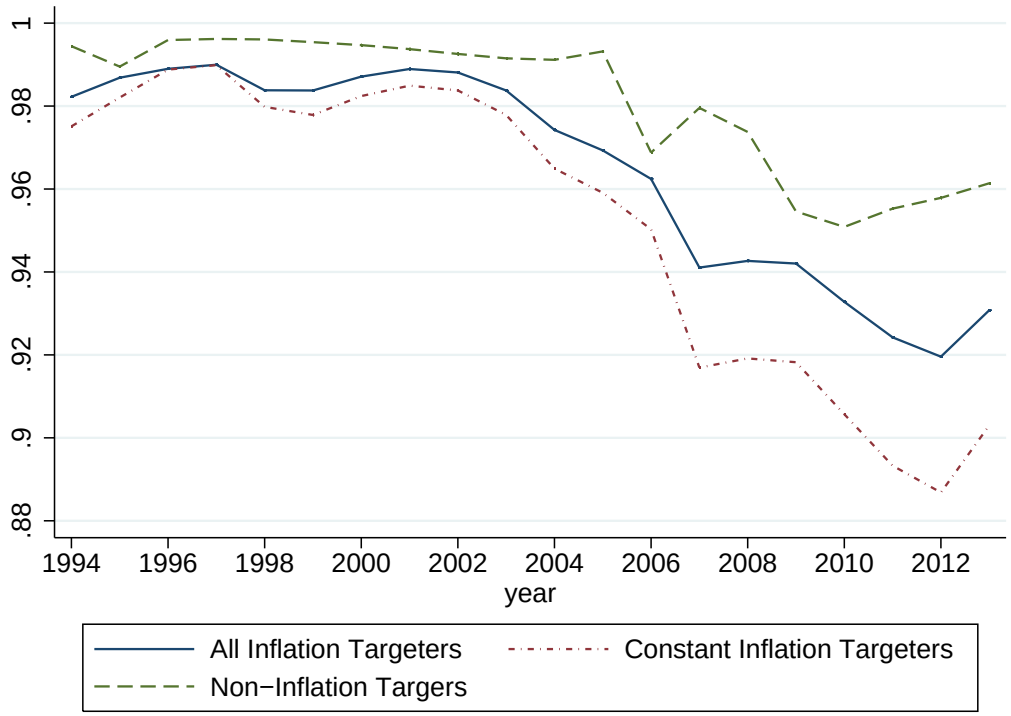
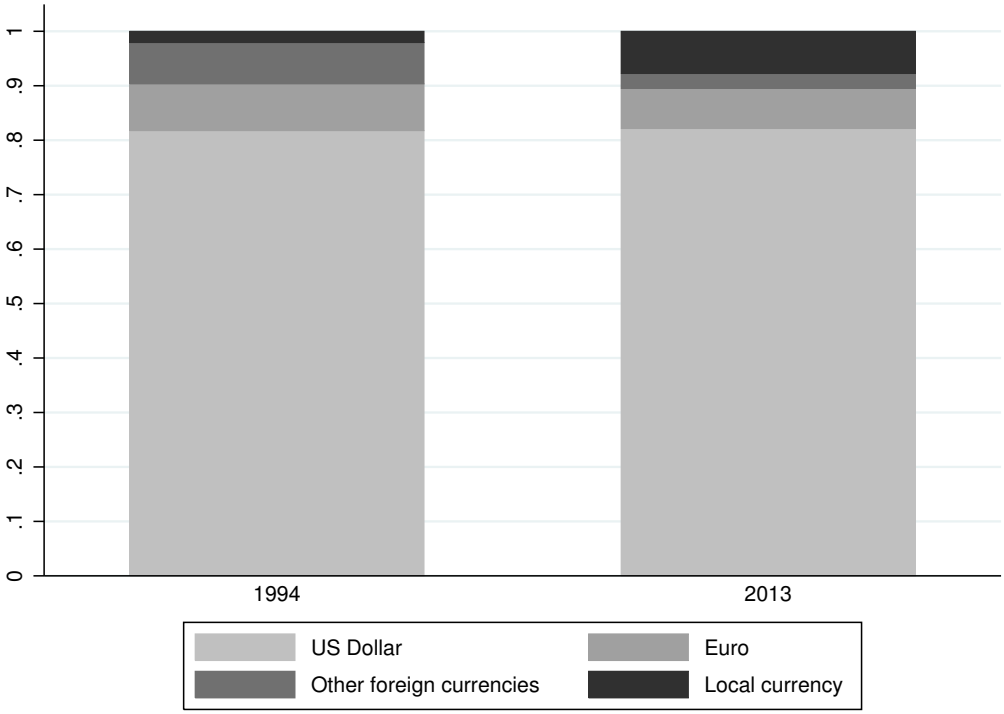


Figure 2: Currency Shares in International Debt

(a) Inflation Targeting countries



(b) non-Targeting countries

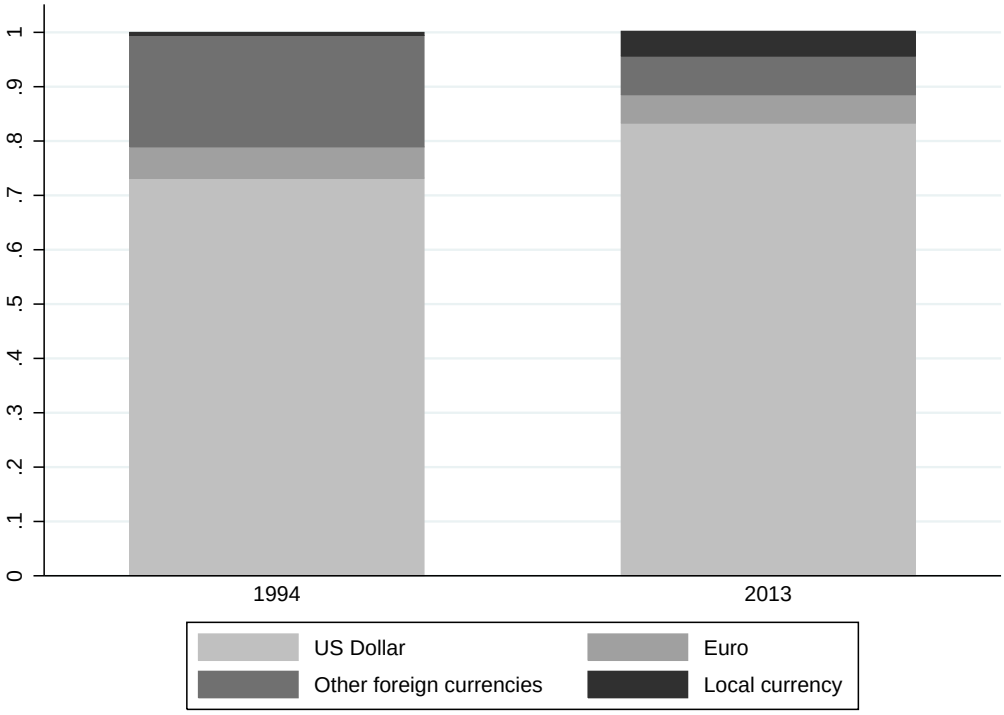


Table 1: The effect of inflation targeting on the foreign currency share in international debt, 1994-2013

		Common Support			Weights		
	FE	n=1	n=3	kernel	n=1	n=3	kernel
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IT	-0.032**	-0.025*	-0.031**	-0.034**	-0.029**	-0.032***	-0.034***
	(0.013)	(0.014)	(0.013)	(0.014)	(0.012)	(0.011)	(0.012)
Debt/GDP	0.004	0.006	0.008	0.005	0.002	0.003	0.005
	(0.003)	(0.006)	(0.005)	(0.003)	(0.006)	(0.006)	(0.004)
KA Openn.	-0.031**	-0.042**	-0.038**	-0.029*	-0.042*	-0.040*	-0.035*
	(0.015)	(0.020)	(0.018)	(0.015)	(0.022)	(0.020)	(0.018)
Fin. Dev.	0.058	0.094*	0.085*	0.058	0.075	0.069	0.055
	(0.042)	(0.050)	(0.047)	(0.042)	(0.051)	(0.049)	(0.045)
Trade	-0.012	-0.082*	-0.047	-0.014	-0.060	-0.043	-0.016
	(0.025)	(0.047)	(0.038)	(0.025)	(0.040)	(0.034)	(0.025)
EX share	-5.534***	-4.839***	-4.871***	-5.525***	-4.874***	-4.892***	-5.297***
	(0.474)	(0.510)	(0.487)	(0.479)	(0.574)	(0.551)	(0.539)
Infl.	-0.063**	-0.079**	-0.085***	-0.064**	-0.092**	-0.094***	-0.080**
	(0.029)	(0.031)	(0.031)	(0.029)	(0.035)	(0.033)	(0.032)
GDP	-0.020	-0.060**	-0.055***	-0.020	-0.067**	-0.063**	-0.037
	(0.019)	(0.024)	(0.020)	(0.021)	(0.032)	(0.028)	(0.028)
Fisc. Bal.	0.106	0.162	0.151	0.111	0.077	0.076	0.082
	(0.103)	(0.169)	(0.154)	(0.106)	(0.132)	(0.126)	(0.102)
E-rate	0.001	0.001	0.001	0.001	0.000	0.000	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Institutions	YES	YES	YES	YES	YES	YES	YES
FE both	YES	YES	YES	YES	YES	YES	YES
Within-R^2	0.472	0.550	0.524	0.475	0.544	0.529	0.499
Observations	705	474	550	684	474	550	684

Robust standard errors in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: The effect of inflation targeting on the foreign currency share in international debt, alternative specifications, 1994-2013

		Common Support			Weights		
	FE	n=1	n=3	kernel	n=1	n=3	kernel
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Panel A: Constant Inflation Target			
IT	-0.067***	-0.059***	-0.060***	-0.067***	-0.057***	-0.060***	-0.066***
	(0.015)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)	(0.014)
Within-R^2	0.528	0.633	0.578	0.529	0.645	0.605	0.575
Observations	671	396	486	657	396	486	657
				Panel B: Government debt			
IT	-0.032**	-0.024	-0.029*	-0.034**	-0.021	-0.028*	-0.033**
	(0.013)	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)	(0.014)
Within-R^2	0.472	0.583	0.540	0.479	0.595	0.555	0.514
Observations	705	398	503	652	398	503	652
				Panel C: Turnover rate			
IT	-0.032**	-0.024*	-0.029**	-0.033**	-0.030**	-0.032***	-0.035***
	(0.013)	(0.014)	(0.013)	(0.014)	(0.013)	(0.012)	(0.012)
Within-R^2	0.472	0.584	0.551	0.495	0.573	0.556	0.519
Observations	705	442	515	629	442	515	629
				Panel D: Exchange rate volatility			
IT	-0.032**	-0.024	-0.031**	-0.034**	-0.028**	-0.031***	-0.034***
	(0.013)	(0.014)	(0.013)	(0.014)	(0.012)	(0.011)	(0.012)
Within-R^2	0.473	0.553	0.527	0.477	0.549	0.534	0.503
Observations	675	467	536	654	467	536	654
				Panel E: Foreign direct investment			
IT	-0.032**	-0.025*	-0.032**	-0.034**	-0.029**	-0.032***	-0.034***
	(0.013)	(0.015)	(0.013)	(0.014)	(0.012)	(0.011)	(0.012)
Within-R^2	0.472	0.551	0.524	0.475	0.545	0.530	0.500
Observations	701	472	548	680	472	548	680

Notes : Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications include the covariates defined in the baseline specification.

Table 3: The effect of inflation targeting on the dollar share in international debt, 1994-2013

		Common Support			Weights		
	FE	n=1	n=3	kernel	n=1	n=3	kernel
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Panel A: Basic			
IT	-0.094*	-0.100*	-0.091*	-0.101*	-0.079*	-0.074*	-0.091**
	(0.053)	(0.053)	(0.051)	(0.054)	(0.040)	(0.039)	(0.040)
Within-R^2	0.166	0.289	0.311	0.174	0.314	0.318	0.216
Observations	716	467	564	695	467	564	695
				Panel B: Government debt			
IT	-0.094*	-0.097*	-0.085	-0.098*	-0.084**	-0.076*	-0.083**
	(0.053)	(0.051)	(0.052)	(0.058)	(0.039)	(0.040)	(0.041)
Within-R^2	0.166	0.316	0.351	0.175	0.382	0.390	0.258
Observations	716	419	463	663	419	463	663
				Panel C: Turnover rate			
IT	-0.094*	-0.072	-0.088	-0.103*	-0.073	-0.080*	-0.099**
	(0.053)	(0.055)	(0.056)	(0.055)	(0.044)	(0.042)	(0.042)
Within-R^2	0.166	0.285	0.312	0.178	0.364	0.356	0.222
Observations	716	409	477	640	409	477	640
				Panel D: Exchange rate volatility			
IT	-0.084	-0.098*	-0.095*	-0.093*	-0.080*	-0.077*	-0.087**
	(0.051)	(0.052)	(0.051)	(0.052)	(0.040)	(0.039)	(0.039)
Within-R^2	0.223	0.316	0.342	0.244	0.340	0.348	0.277
Observations	675	448	538	654	448	538	654
				Panel E: Foreign direct investment			
IT	-0.089*	-0.098*	-0.095*	-0.098*	-0.080**	-0.077*	-0.089**
	(0.052)	(0.051)	(0.051)	(0.053)	(0.039)	(0.039)	(0.039)
Within-R^2	0.215	0.310	0.335	0.235	0.335	0.342	0.271
Observations	701	455	552	680	455	552	680

Notes : Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications include the covariates defined in the baseline specification.

Table 4: The effect of inflation targeting on the euro share in international debt, 1994-2013

		Common Support			Weights		
	FE	n=1	n=3	kernel	n=1	n=3	kernel
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Panel A: Basic			
IT	0.059	0.085	0.059	0.062	0.048	0.029	0.031
	(0.055)	(0.062)	(0.063)	(0.057)	(0.040)	(0.042)	(0.039)
Within-R^2	0.157	0.198	0.158	0.157	0.216	0.182	0.172
Observations	705	436	517	684	436	517	684
				Panel B: Government debt			
IT	0.059	0.022	0.017	0.060	0.018	0.007	0.031
	(0.055)	(0.067)	(0.064)	(0.061)	(0.045)	(0.040)	(0.038)
Within-R^2	0.157	0.234	0.199	0.153	0.346	0.300	0.254
Observations	705	387	448	652	387	448	652
				Panel C: Turnover rate			
IT	0.059	0.052	0.070	0.064	0.032	0.041	0.034
	(0.055)	(0.055)	(0.056)	(0.058)	(0.037)	(0.039)	(0.041)
Within-R^2	0.157	0.156	0.150	0.164	0.122	0.117	0.123
Observations	705	414	473	629	414	473	629
				Panel D: Exchange rate volatility			
IT	0.052	0.071	0.043	0.055	0.040	0.020	0.025
	(0.054)	(0.056)	(0.060)	(0.056)	(0.037)	(0.041)	(0.039)
Within-R^2	0.173	0.219	0.191	0.174	0.231	0.204	0.188
Observations	675	406	487	654	406	487	654
				Panel E: Foreign direct investment			
IT	0.054	0.078	0.051	0.058	0.045	0.025	0.028
	(0.054)	(0.060)	(0.062)	(0.057)	(0.039)	(0.042)	(0.039)
Within-R^2	0.163	0.201	0.168	0.164	0.218	0.188	0.178
Observations	701	432	513	680	432	513	680

Notes : Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications include the covariates defined in the baseline specification.

Table 5: The effect of inflation targeting on the other foreign currencies share in international debt, 1994-2013

		Common Support			Weights		
	FE	n=1	n=3	kernel	n=1	n=3	kernel
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Panel A: Basic			
IT	0.002	0.036	0.034	0.005	0.039	0.037	0.024
	(0.025)	(0.031)	(0.028)	(0.027)	(0.026)	(0.025)	(0.024)
Within-R^2	0.246	0.462	0.454	0.253	0.439	0.435	0.274
Observations	705	462	525	684	462	525	684
				Panel B: Government debt			
IT	0.002	0.018	-0.008	0.005	0.021	0.006	0.021
	(0.025)	(0.015)	(0.021)	(0.028)	(0.014)	(0.017)	(0.022)
Within-R^2	0.246	0.448	0.465	0.254	0.565	0.526	0.293
Observations	705	378	462	652	378	462	652
				Panel C: Turnover rate			
IT	0.002	0.002	0.033	0.009	0.013	0.037	0.027
	(0.025)	(0.016)	(0.036)	(0.028)	(0.017)	(0.029)	(0.024)
Within-R^2	0.246	0.528	0.354	0.271	0.544	0.357	0.302
Observations	705	411	479	629	411	479	629
				Panel D: Exchange rate volatility			
IT	0.001	0.037	0.037	0.004	0.041	0.041	0.025
	(0.027)	(0.031)	(0.030)	(0.029)	(0.026)	(0.026)	(0.025)
Within-R^2	0.251	0.469	0.466	0.258	0.457	0.455	0.279
Observations	675	455	495	654	455	495	654
				Panel E: Foreign direct investment			
IT	0.003	0.036	0.035	0.006	0.039	0.038	0.025
	(0.025)	(0.031)	(0.030)	(0.028)	(0.026)	(0.025)	(0.024)
Within-R^2	0.246	0.462	0.456	0.254	0.441	0.436	0.276
Observations	701	460	521	680	460	521	680

Notes : Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications include the covariates defined in the baseline specification.

Appendix

Table A1: Inflation targeting countries and starting years

Countries	Inflation Targeting Year	Constant Inflation Targeting Year
Albania	2009	2009
Armenia	2006	2007
Brazil	1999	2005
Chile	1999	2001
Colombia	1999	2010
Ghana	2007	
Guatemala	2005	
Indonesia	2005	
Mexico	2001	2002
Peru	2002	2007
Philippines	2002	2011
South Africa	2000	2000
Thailand	2000	2009
Turkey	2006	2012
Uruguay	2002	2007

Notes : The starting dates of inflation targeting come from Hammond (2012) and Roger (2010). The constant inflation targeting starting year is the first year in which a country had an unchanging target or target range. Our sample of inflation targeting developing countries excludes Israel and South Korea. Beginning 1997, the World Economic Outlook includes these countries in the list of the advanced economies. The reclassification is explained by the advanced stage of economic development in these countries, IMF (1997).

Table A2: Non-targeting countries – control group

Countries			
Algeria	Argentina	Azerbaijan	Bahamas
Bahrain	Barbados	Belarus	Belize
Bermuda	Bolivia	China	Congo
Costa Rica	Cote d'Ivoire	Cuba	Dominican Republic
Egypt	Fiji	Gabon	Georgia
Grenada	Haiti	India	Iran
Iraq	Jamaica	Jordan	Kazakhstan
Kenya	Kuwait	Lebanon	Liberia
Macedonia, FYR	Malaysia	Marshall Islands	Mauritius
Morocco	Namibia	Nicaragua	Nigeria
Oman	Pakistan	Papua New Guinea	Paraguay
Qatar	Romania	Russia	Saudi Arabia
Senegal	Serbia	Seychelles	Sri Lanka
Suriname	Trinidad and Tobago	Tunisia	Ukraine
United Arab Emirates	Venezuela	Vietnam	Zimbabwe

Table A3: Data Sources and Definitions

Variable	Definition	Source
Foreign Currency Share	Share of foreign currency in international debt = 1 - (local currency debt/total international debt)	Debt Securities Statistics, Bank of International Settlements (BIS)
Inflation Targeting	Binary variable = 1 if in a given year a country operates under inflation targeting, 0 otherwise.	Hammond (2012) and Roger (2010)
GDP	Gross Domestic Product (current US$)	World Development Indicators (WDI), World Bank (WB)
Financial Development	Domestic credit to private sector (% of GDP)	WDI, WB
Trade Openness	Sum of imports and exports (% of GDP)	WDI, WB
Inflation	Consumer price index (annual %)	World Economic Outlook (WEO), IMF
Fiscal Balance	General government revenues minus expenditures (% of GDP)	WEO, IMF
Share of World Exports	Total exports / Total world exports	Direction of Trade, IMF
Financial Openness	Capital Account Openness index	Chinn & Ito (2006) updated from http://web.pdx.edu/ ito/
Exchange Rate Regime	De facto exchange rate classification that varies within 15 categories where a low (high) value indicates a fixed (flexible) regime.	Reinhart & Rogoff (2004) and Reinhart & Rogoff (2009). Updated from www.carmenreinhart.com/data/
Exchange Rate Volatility	Standard deviation of the nominal effective exchange rate	WEO, IMF
Foreign Direct Investment	Foreign Direct Investment net inflows (% of GDP)	WEO, IMF

Variable	Definition	Source
Democratic Accountability	Democratic Accountability index, 0-6	International Country Risk Guide (ICRG), The Political Risk Services Group (PRS Group)
Ethnic Tensions	Ethnic Tensions index, 0-6	ICRG, PRS Group
Religion Tensions	Religion Tensions index, 0-6	ICRG, PRS Group
Law and Order	Law and Order index, 0-6	ICRG, PRS Group
Military in Politics	Military in Politics index, 0-6	ICRG, PRS Group
Corruption	Corruption index, 0-6	ICRG, PRS Group
External Conflict	External Conflict index, 0-12	ICRG, PRS Group
Internal Conflict	Internal Conflict index, 0-12	ICRG, PRS Group
Government Stability	Government Stability index, 0-12	ICRG, PRS Group
Socieconomic Conditions	Socieconomic Conditions index, 0-12	ICRG, PRS Group
Broad Money Growth	Annual growth rate of money and quasi money	WEO, IMF
Real GDP per capita	GDP per capita (constant 2000 US$)	WDI, WB
Governor's Turnover Rate	Central Bank governors turnover rates, reverse proxy of central bank independence	Dreher et al. (2010)
Government Gross Debt	General government gross debt (% of GDP)	WDI, WB