**Further evidence on inflation targeting and income distribution\***

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**Abstract**

This paper examines the effect of inflation targeting (IT) on income distribution in a panel of 70 countries. Employing panel regressions and a variety of propensity score matching methods, we find strong evidence that that incomes became more unequal in IT-adopting countries relative to countries that did not adopt IT. Panel regressions suggest that Gini coefficients increased by 0.25 to 0.57% and the share of income of the top 1% and 10% of households increased by 0.7% in IT adopter countries. Using propensity score matching methods, IT has been associated with a relative rise in Gini coefficients of about 1-2 percentage points, and a relative increase in the share of national income going to the top 1% and 10% of households by about 11-13 percentage points and 13-17 percentage points, respectively. The results are robust to changes in country sample and alternative estimation methodologies.

**KEYWORDS**

income distribution, gini coefficients, top income shares, inflation targeting, monetary policy.

**JEL CLASSIFICATIONS:** E52, D31

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**I INTRODUCTION**

Income inequality has risen in many advanced economies since the early 1980s (Piketty, 2014; Atkinson, 2015). Greater inequality can make resource allocation less efficient, constrain the growth of output growth, and depress consumption and investment (Onaran et al., 2011; Berg et al., 2018; Madsen et al., 2018). It may also result in higher household indebtedness, drive asset market bubbles, and increase financial instability (Coibion et al., 2014; Kumhof et al., 2015; Perugini et al., 2016). Against this background, the distributional effects of monetary policy have been of increasing concern among policymakers for some years (e.g., Bernanke, 2015; Draghi, 2015).

An area that has received little attention to date is whether the effects of monetary policy on income distribution depend in part on the monetary framework that is in place, for example, if it has an inflationary or deflationary bias relative to some other framework. The dominant framework for monetary policy over the last two decades has become inflation targeting (IT), having been adopted by at least 38 countries since New Zealand first did so in 1989. In this paper, we examine whether the adoption of an IT framework has had implications for income distribution in IT adopter countries relative to non-adopters. One way that this might take place, for example, is if an enhanced or single-minded focus on achieving low and single-digit inflation targets was to be harmful to the rate and volatility of economic growth (Meyer, 2002; Blanchard, 2006). In this regard, Roger (2010) argues that many IT-adopter countries passed through an initial period of disinflation by setting year-by-year decreasing inflation targets until a target of around 3% could be set, which might be expected to have adverse effects on output. Lamla et al. (2019) and Bhalla et al. (2023) provide some support for the view that IT regimes have had a deflationary bias.

To anticipate our key results, we find that countries that adopted IT experienced greater income inequality relative to countries that did not adopt IT. Panel regression results suggest a relative increase in Gini coefficients of 0.25-0.57% and in the share of income of the top 1% and 10% of households of about 0.7% in IT adopter countries. Results from a variety of propensity score matching methods to evaluate the treatment effect of IT suggest that IT adoption raised Gini coefficients by about 1-2 percentage points and increased the share of national income going to the top 1% and top 10% of households by about 10-17 percentage points. The relative deterioration in income distribution has been worse for lower-income IT adopter countries.

Our paper makes two contributions to the scant literature on IT adoption and income distribution. First, we deal with an important econometric issue in evaluating the effect of IT adoption, which is the nonrandom selection of policy options that arises when a country’s monetary policy regime choice is systematically correlated with a set of observable variables that also affect the outcomes and that can lead to biased estimates. With few exceptions (e.g., Lin & Ye, 2007, 2009, 2013), the empirical studies of the effects of IT-adoption on economic performance have failed to address this issue. Typically, these studies compare developments under non-IT and IT regimes, or they search for IT effects by incorporating an IT adoption dummy into a data panel and examining the statistical significance and sign of the coefficient on the dummy. The former approach provides no basis for comparing experiences and they both ignore the self-selection problem of policy that arises when a country’s policy choice is non-random. We test for a relationship between IT regimes and income distribution employing a panel of 70 countries, of which 31 adopted IT, and address the self-selection problem by making use of propensity score-matching methods to evaluate the treatment effect of IT on several measures of income distribution. Second, we contribute to the small literature that has examined the economic effects of IT adoption beyond a country’s inflation and growth performance, including for example, the effects of IT on dollarization (Lin & Ye, 2013), exchange rate regimes (Ebeke & Fouejieu, 2018) and government borrowing costs (Fouejieu & Roger, 2013; Thornton & Vasilakis, 2016).

The rest of the paper is organized as follows. In the next section we set IT in the context of the recent literature linking monetary policy to income distribution and discuss some of the related empirical evidence. Section III describes our methodology and data. Our empirical results are presented in Section IV, and Section V concludes.

**2 MONETARY POLICY, INFLATION TARGETING AND INEQUALITY**

**2.1 Monetary Policy and Income Inequality**

In theory, the effect of monetary policy on inequality is ambiguous because the quantitative importance of different transmission channels can result in its increase or decrease (e.g., Coibon et al. 2017). For instance, an expansionary monetary policy could increase inequality by boosting asset prices and/or inflation. In the first case, the effect depends on the composition of household income and the impact of monetary policy on different asset prices; high-income households receive higher shares of financial income than do low-income households and might benefit more from an expansionary policy. In the second case, an expansionary policy could increase income inequality through higher inflation as low-income households rely primarily on labor earnings and hold more liquid assets than do high-income households. However, there are other transmission channels that would predict that an expansionary monetary policy could reduce inequality. First, it could do so by redistributing savings as an unexpected decrease in policy rates will likely benefit borrowers and hurt savers (Doepke & Schneider 2006; Cloyne et al., 2020). Second, since labor earnings at the bottom of the distribution are most affected by changes in economic activity, an expansionary monetary policy could lead to a decline in income inequality (Heathcote et al., 2010).

Unfortunately, the empirical literature on the impact of monetary policy on income inequality yields mixed conclusions. Some studies find that contractionary conventional monetary policy increases income inequality (Huber and Stephens, 2014; Coibion et al., 2017; Mumtaz & Theophilopoulou, 2017; Furceri, et al., 2018; Guerello, 2018), but other studies report the opposite results (Inui et al., 2017; Cloyne, et al., 2020), or results that vary across countries (O’Farrell et al., 2016; O’Farrell & Rawdanowicz, 2017), and yet others report no or very little effect (Casiraghi et al., 2018). Some evidence shows that unconventional monetary policy reduced income inequality in the euro area countries (Casiraghi et al., 2018; Guerello, 2018; Lenza & Slacalek, 2024), but Saiki & Frost (2014), Montecino & Epstein (2015), and Mumtaz & Theophilopoulou (2017) find that it increased income inequality in Japan, the US, and the UK, respectively, and Inui et al. (2017) report it had insignificant distributional effects in Japan.

**2.2 Inflation Targeting and Income Inequality**

The increased adoption of IT frameworks to control inflation mainly reflected dissatisfaction with past experiences of using currency pegs and money supply targets as nominal anchors (Roger 2010). The currency peg approach meant that a country’s monetary policy was essentially that of the country to which it pegged, and it constrained the central bank’s ability to respond to such shocks. Monetary targeting had limited success because the demand for money became unstable, including because of innovations in the financial markets. In contrast to an exchange-rate peg, IT enables monetary policy to focus on domestic considerations and to respond to shocks to the domestic economy; and in contrast to monetary targeting, it has the advantage that a stable relationship between money and inflation is not critical to its success (Mishkin, 2000). In addition, IT brought greater transparency to policy through increased communication about the plans and objectives, and increased accountability of the central bank for attaining its announced objectives (Bernanke & Mishkin, 1997).

IT is relatively straightforward (e.g., Bernanke & Mishkin, 1997; Heenan et al., 2006). The authorities (central bank, government or both) set a numerical target for the rate of inflation. The central bank forecasts the future path of inflation and compares it with the target rate and the difference between the forecast and the target determines how interest rates have to be adjusted. For IT to be effective, the central bank must be free to choose the instruments (mainly interest rates) to achieve the target, and monetary policy should target only the rate of inflation and ignore other indicators (e.g., the level of employment, or the exchange rate), and it should be clear to the public that hitting the inflation target takes precedence over all other objectives of monetary policy. In addition, IT typically emphasizes achieving the inflation target over the medium term (e.g., two to three years) to provide a rule-like framework within which central banks have the discretion to react to shocks.

These essential elements of the operating framework for an IT regime can be easily accommodated in a New Keynesian framework with a rule for monetary policy that stipulates that the nominal rate of interest is the sum of the real interest rate and expected inflation. The rule incorporates a symmetric approach to inflation targeting whereby inflation above the target leads to higher interest rates to contain inflation and inflation below the target requires lower interest rates to increase inflation. Any impact of an IT regime on income distribution depends mainly on the quantitative importance of the different transmission channels of monetary policy, which, as discussed above, are ambiguous in their effects on income distribution, and on the speed with which monetary authorities adjust the policy rate when inflation deviates from the inflation target. In the latter regard, for example, by giving central banks more discretion with respect to the timing of monetary policy actions, IT regimes could act to mitigate the impact of monetary policy on income distribution because policy decisions are taken after more (longer) consideration, especially if the inflation target is set over the medium term. On the other hand, IT regimes might accentuate the impact of monetary policy if central banks overreact act to deviations from the inflation target (e.g., out of concern that the target will lose credibility as an anchor if deviations persist), which could give IT regimes a deflationary bias.

Most empirical evaluations of the effects of IT regimes have focused on macroeconomic outcomes of countries following IT adoption as compared to non-targeting countries (e.g., Capistrán & Ramos-Francia ,2010; Ball & Sheridan, 2003; Levin et al., 2004; Lin & He, 2007, 2009; Mishkin & Posen, 1998), and on central bank behavior under inflation targeting (e.g., Aizenman et al., 2011; Corbo et al., 2001). In both cases, there remains a substantial academic and policy debate over whether IT has contributed to an improvement in economic performance or changed central bank behavior. However, there is very little empirical work that treats explicitly the role of inflation targets in affecting income distribution. Early related studies focused on the inflation-income distribution nexus and as discussed, more recent studies have examined the impact of monetary policy shocks on income distribution with mixed results. Only a few studies focus on the impact of IT adoption on income distribution. Dolado et al. (2021) incorporate a capital-skill complementarity idea into a New Keynesian model and examine the performance of different systematic monetary policy rules in the face of shocks in the US. They find that strict inflation targeting is more successful in stabilizing the economy and limiting variations in relative income shares than the other rules considered. Ballabriga & Davtyan (2022) evaluate the distributional effect of monetary policy for the IT period in the UK using structural vector autoregression (VAR) methodology. Their results indicate that an expansionary policy shock increases income inequality, which they attribute to the positive effect of capital income outweighing the stimulating impact on labor earnings. However, the study makes no comparison between income distribution developments under IT and non-IT regimes. Tavares Garcia & Cross (2023) employ a VAR modeling approach to examine the role of IT regimes across G12 economies over 1974-2019 and find that monetary policy shocks increased disposable income inequality by much less for IT targeter countries than for non-IT targeters. Finally, Altunbaş & Thornton (2022) conduct a panel regression analysis of 121 advanced and developed countries that incorporates a dummy variable delineating 27 IT adopters, and report that IT regimes are associated with a deterioration in income distribution for both country groups of between 3.6 and 7.6 percentage points.

**3 METHODOLOGY AND DATA**

**3.1. Methodology**

**3.1.1 Panel estimation**

Past empirical studies of the impact of inflation targeting on income distribution average across the various channels through it might have an impact by incorporating an IT adoption dummy into a data panel to examine the statistical significance and sign of the coefficient on the dummy variable. We follow a variant of this practice in Equation (1) which is the following:

$y\_{i,t}=α\_{0}+β\_{1} ITadoption\_{t}+β\_{2}ITadopter\_{i}\*ITadoption\_{t}+X\_{i,t}+γ\_{i}+ ϵ\_{i,t}$ (1)

where $y\_{it}$ represents income inequality, measured either by the pre-tax and post-tax Gini coefficients and the shares of income going to the top 10 and 1 percent of households. $ITadoption$ represents a dummy variable that indicates the year in which a country adopted an IT regime and zero for all other years. *IT*$adopter$ is a dummy variable equal to one for all the years that a country pursues IT and zero for other years.[[1]](#footnote-1)$X\_{i,t}$ is a vector of variables that have been shown to influence income inequality, and $γ\_{i}$ denotes country fixed effects.

In Equation (1) $β\_{1}$, captures any change in income distribution following the adoption of IT and$β\_{2}$ captures the effect of the adoption of IT regime on income inequality in countries that adopted the rule compared to those that did not. A positive and statistically coefficient for $β\_{2}$ would indicate, *ceteris paribus*, that income distribution becomes more unequal for countries that adopted IT. In $X\_{i,t}$ we include the growth of real per capita GDP growth, because low growth has been associated with greater income inequality (Piketty, 2014); the rate of inflation, because inflation adds to economic uncertainty and can depress both average incomes and the incomes of the poor (Romer & Romer, 1998); the ratio of foreign trade to GDP, because theory and much empirical evidence supports the view that trade liberalization is poverty alleviating in the long run (Winters et al., 2004); the ratio of government final consumption to GDP, because the median voter theory of government size predicts that greater inequality leads to demand for redistribution and larger government (Meltzer & Richard, 1981); an index of representative democracy to capture the impact of voter rights, because democracy is expected to increase redistribution and reduce inequality (Acemoglu et al., 2015); the level of financial development, which has been shown to promote equality in upper-middle income countries, but to promote inequality in low- and high-income countries (Altunbaş & Thornton, 2019; Greenwood & Jovanovic, 1990); and a dummy variable to control for the impact of economic crisis because the conventional wisdom is that the poor suffer disproportionately from recessions following financial crises (De Haan & Sturm, 2017).

**3.1.2 Treatment Effects and Selection Bias**

Equation (1) gives rise to an important econometric issue in evaluating the effect of IT adoption when the decision to adopt an IT regime is not random. If IT adoption is systematically correlated with a set of variables that also affect the outcomes, then we will have the selection on variables problem, which makes linear regression with an IT adoption dummy an unreliable method. At least two sources of endogeneity seem likely. The first is possible inverse causality between some covariates and income inequality. For example, since monetary policy can impact income distribution, the monetary authorities in some countries may adjust their policies to avoid an increase in income inequality. In this case, IT could be driven partly by income inequality rather than the converse. The second source of endogeneity could be omitted variable bias since we cannot control for all the determinants of income inequality.

To address the self-selection problem, we make use of different propensity score matching (PSM), which aims to overcome selection bias in observational studies. Selection bias arises when there are systematic differences between the treatment and control groups that are not accounted for and can lead to biased estimates of treatment effects. By estimating the probability (propensity score) of receiving treatment based on observed covariates, PSM attempts to balance the distribution of covariates between treatment groups, making them more comparable and reducing bias. This approach helps to mimic the random assignment of treatments in experimental studies, thereby addressing the bias that arises from non-random treatment assignment. PSM also offers several advantages over traditional regression techniques, particularly when dealing with complex datasets with numerous covariates and non-linear relationships. They provide a flexible framework for adjusting for confounding variables while avoiding overfitting, thus enhancing the robustness of causal inference. Finally, they allow for the evaluation of treatment effects in observational studies without making stringent parametric assumptions, making them suitable for diverse research contexts. Overall, the selection of PSM in this study reflects its effectiveness in addressing selection bias and its suitability for the analytical objectives of the research. [[2]](#footnote-2)

PSM methods have been applied to macroeconomic issues, for example, in papers by Lin and Ye (2007, 2010, 2013) and Thornton and Vasilakis (2018). In our case, the objective is to evaluate the treatment effect of inflation targets in countries that have adopted such a monetary policy regime. We employ four commonly used propensity score matching methods: two nearest-neighbor matching estimators with n = 1 and n = 3, three radius matching estimators with a wide radius (r = 0.04), a medium radius (r = 0.02), and a tight radius (r = 0.01), a regression-adjusted local linear matching estimator, and a kernel matching estimator, which matches a treated group country to all control group countries weighted in proportion to the closeness between the treated group country and the control group country.[[3]](#footnote-3)

**3.3. Data**

The data on the Gini coefficients are from The Standardized World Income Inequality Database (Solt, 2020), and data on the top income shares are from the World Inequality Lab’s World Inequality Database.[[4]](#footnote-4) Our treatment group comprises 31 IT countries that adopted the regime during the period 1980-20183 and for which there is income distribution data for at least five years. The IT adoption years are from Roger (2010), Hammond (2012), Bhalla et al., (2023) and central bank websites. The IT adopters include 15 high-income countries according to the World Bank’s country income classification system and 16 lower income countries.[[5]](#footnote-5) Table 1 lists the IT countries and the year of IT adoption. Data for the macroeconomic control variables for our panel regressions are from the World Bank’s World Development Indicators database and the index of representative government is from the Institute for Democracy and Electoral Assistance database. We also draw on Ali Abbas et al. (2011) and the IMF’s World Economic Outlook database for data on public debt, Reinhart and Rogoff (2004) and Ilzetzki et al. (2022) for exchange rate regime classifications (their coarse grid categorization, which ranges from 1 [least flexible] to 5 [most flexible]), and Nguyen et al. (2022) for the dating of financial crises.

To ensure that the treatment group and the control group of countries are reasonably comparable, we include in the control group only those countries that have a real GDP per capita at least as large as that of the poorest IT country, and that have at least five years of income inequality data are available. Table 2 lists the 39 non-IT targeting countries that satisfy these criteria. In total, the data set comprises an unbalanced sample of annual observations for 70 countries over the period 1980 to 2018. Summary statistics, variable definitions and data sources are reported in Table 3.

**4. EMPIRICAL RESULTS**

**4.1 Panel Results**

Table 4 reports the regression results from estimating Equation (1) for four measures of income inequality. The methodology is ordinary least squares with fixed time and country effects. For each measure of income distribution, we present the results with and without the control variables. For estimation purposes, all series are winsorized at 10% to limit extreme values and reduce the effect of possibly spurious outliers.[[6]](#footnote-6) In the estimates of the pre- or post-tax Gini coefficients the coefficients on $β\_{2}$ are positive and statistically significant at the 1% level, indicating that incomes became more unequal in countries that adopted IT relative to countries that did not by 0.58 and 0.25%, respectively, when the control variables are included. The coefficients on $β\_{2}$ are also positive and statistically significant in the estimates for the share of income of the top 1% and 10% of households, suggesting that the income shares of high-income households increased in countries that adopted IT by 0.07% relative to those countries that did not when the control variables are included. While these IT effects may seem relatively small, they need to be viewed in the context of the modest and uncertain effects of monetary policy on income distribution in the empirical literature discussed above. For example, the O’Farrell et al. (2016) and Huber & Stephens (2014) studies report that a percentage point reduction in policy interest rates increases the Gini coefficient by 0.02% and 0.4%, respectively. Closer to our study, although our results are not strictly comparable, they support the findings of Altunbaş and Thornton (2022), that IT is associated with a deterioration in income inequality, though by smaller magnitudes than they suggest. Finally, our results are contrary to the findings Tavares Garcia & Cross (2023) who report that income inequality rises by less in countries with an IT anchor in response to monetary contraction.[[7]](#footnote-7)

The coefficients on the control variables for the Gini coefficient estimates indicate that higher inflation, more foreign trade, greater financial development, and financial crisis are associated with a deterioration income distribution. In the income shares estimates higher inflation, more trade, and more financial development also increase inequality but an increase government consumption expenditures reduces it. Somewhat surprisingly, the income shares of high-income households also appear increase with more representative government, which suggests that voter demand for inequality-reducing policies has been relatively weak.

Overall. the results are strongly suggestive that income inequality increased in countries that adopted IT relative to countries that did not, suggesting that IT regimes might have a deflationary bias. However, as discussed above we suspect these panel regression results to be biased because of endogeneity.

**4.2 Estimating the Average Treatment Effects on Income Distribution**

4.2.1 Propensity Scores

 We first estimate the propensity scores using a probit model. The dependent variable is an IT-adopter dummy variable that takes the value of 1 in the year a country adopted IT and zero otherwise. In the choice of control variables, we are guided by Gonçalves and Carvalho (2008) who suggest controlling for desirable preconditions as suggested by the IT literature, and for the likelihood of choosing exchange rate targeting as an alternative framework for the conduct of monetary policy. In our probit estimations, we include lagged inflation, the growth of GDP per capita, the level of public debt in relation to GDP, the trade-to-GDP ratio, a measure of exchange rate flexibility, and a dummy variable equal to one if there is a financial crisis and zero otherwise. The literature suggests that IT adoption is most suited to countries with low levels of inflation and public debt, higher rates of GDP growth, more flexible exchange rates, and less open to trade.[[8]](#footnote-8)

The probit results are reported in the first column of Table 5. Results from the full sample of countries are reported in column (1) while columns (2) and (3) report the results from high-income and lower-income countries, respectively. The results suggest that high-income countries are more likely to adopt an IT regime if they have experienced higher inflation and growth of real GDP per capita, have more flexible exchange rates, and lower levels of public debt and trade openness. For lower-income countries, the results are similar but the coefficients on inflation and GDP growth are not statistically significant.

4.2.2 Results from Matching

In applying the matching methods, we first sort all the observations by their estimated propensity scores dropping the observations whose estimated propensity scores are lower than the lowest score among the treated units. In this way, we can be sure that our treated and control groups are comparable. The matching results based on the new pooled sample are presented in Table 6. The table reports the estimated average treatment effect on the treated (ATTs) on four measures of income inequality: the pre- and post-tax Gini coefficients and the shares of income going to the highest 1% and highest 20% of income earners. Columns (1) and (2) show the results from the one-to -one nearest-neighbor and three-nearest neighbor matching. Columns (3) to (5) report the results from radius matching and columns (5) and (6) report the results from local linear matching and kernal matching, respectively. They results suggest strong treatment effects from adopting IT. On average, for the pooled sample the adoption of IT was associated with an increase in the pre- and post-tax Gini coefficients of 1-2 percentage points and an increase in the share of national income going to the top 1% and top 10% of households of about 11-13 percentage points and 13-17 percentage points, respectively.

Tables 7 and 8 report matching results separately for the high-income and lower-income countries, respectively. There are strong treatment effects of IT for both groups of countries, but they are relatively larger for lower-income countries. On average, for the high-income countries the adoption of IT resulted in pre- and post-tax Gini coefficients, and shares of income going to the top 1% and top 10% of households all being about 1 percentage point higher. In the lower- income countries the adoption of IT resulted in pre- and post-tax Gini coefficients that were about 3.5 percentage points higher; the share of income going to the top 1% of households was about 4 percentage points higher, and the share of income going to the 10% of households was about 13.5 percentage points higher.

**5 CONCLUSIONS**

The few previous studies of the impact of IT on income distribution provide mixed results. This may be in part because they make no comparison between developments under non-IT and IT regimes, or they ignore the self-selection problem of policy and provide biased estimates. In this study, we use traditional panel estimates and different propensity score matching methods to examine the impact of IT adoption on income distribution in a panel of 70 high-income and lower-income countries of which 31 adopted IT. The panel regression results suggest that Gini coefficients increased by between 0.25-0.57% and the share of income of the top 1% and 10% of households increased by about 0.7% in IT adopter relative to non-IT adopter countries. Using a variety of propensity score matching methods to evaluate the treatment effect of IT, we find that IT adoption raised pre- and post-tax Gini coefficients by about 1% and increased the shares of national income going to the top 1% and 10% of households also by 1-2 percentage points, with the deterioration in income distribution being greater in lower-income IT adopter countries.

Our results suggest that the monetary anchor matters in assessing the impact of monetary policy on income distribution and, in particular, that a monetary framework with an IT anchor seems likely to accentuate any harmful impact that monetary policy might have on income distribution. This would be consistent with IT regimes having a deflationary bias, perhaps reflecting central banks’ concerns about maintaining the credibility of the anchor. Our results should be of interest to monetary authorities that have already adopted or are considering adopting IT as a nominal anchor but are concerned about the distributional implications of the associated monetary policy. They suggest that IT adoption should be accompanied by policies to contain any adverse distributional effects.

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| **TABLE 1** Treatment group: inflation targeting (IT) countries through 2018 and IT adoption year |
| High-Income Countries | IT Adoption Year |
| Australia | 1993 |
| Canada | 1991 |
| Chile | 1999 |
| Czech Republic | 1998 |
| Hungary | 2001 |
| Iceland | 2001 |
| Israel | 1992 |
| Korea | 1998 |
| New Zealand | 1990 |
| Norway | 2001 |
| Poland | 1998 |
| Sweden | 1993 |
| United Kingdom | 1992 |
| United States | 2012 |
| Uruguay | 2011 |
| Other (Lower)-Income Countries |
| Armenia | 2006 |
| Brazil | 1999 |
| Colombia | 1999 |
| Dominican Republic | 2012 |
| Guatemala | 2005 |
| Indonesia | 2005 |
| Mexico | 1999 |
| Paraguay | 2011 |
| Peru | 2002 |
| Philippines | 2002 |
| Romania | 2005 |
| Serbia | 2009 |
| South Africa | 2000 |
| Thailand | 2000 |
| Turkey | 2006 |
| Uganda | 2011 |
| *Note*: IT adoption dates are from Hammond (2011), Bhalla et al. (2023), and central bank websites. Includes only IT adopter countries that adopted IT during 1980-2018 and had at least five years income distribution data.  |

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| **TABLE 2** Control group countries |
| High-Income Countries |
| Austria | Germany | Japan | Slovak Republic |
| Belgium | Greece | Lithuania | Spain |
| Denmark | Hong Kong | Netherlands | Switzerland |
| Finland | Ireland | Portugal |  |
| France | Italy | Singapore |  |
| Other (Lower)-Income Countries |
| Algeria | Bulgaria | El Salvador | Panama |
| Angola | China | Iran | Russia |
| Argentina | Costa Rica | Jordan | Tunisia |
| Azerbaijan | Croatia | Kazakhstan |  |
| Belarus | Ecuador | Lebanon |  |
| Bosnia and Herzegovina | Egypt | Malaysia |  |
| *Note*: Country income classifications are for 2018 and are from the World Bank. The control group comprises all non-IT countries for which sufficient data is available. Includes only countries that have a real GDP per capita at least as large as that of the poorest IT country and that have at least five years of income inequality data.  |

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| **TABLE 3** Summary statistics, variable definitions and data sources |
| Variable | Mean | Standard deviation | Maximum | Minimum | Description | Source |
| Pre-tax Gini | 46.049 | 6.036 | 68.800 | 29.100 | Estimate of Gini index of inequality in equivalized household market (pre-tax, pre-transfer) income. | Solt (2020) |
| Post-tax Gini | 35.651 | 8.736 | 60.200 | 17.400 | Estimate of Gini index of inequality in equivalized household disposable (post-tax, post-transfer) income. | Solt (2020) |
| Income share of Top 1% | 14.353 | 6.185 | 47.800 | 2.050 | Top 1% share of pre-tax national income | World Income Inequality Database |
| Income share of Top 10% | 41.563 | 10.861 | 67.830 | 16.690 | Top 10 % share of pre-tax national income | World Income Inequality Database |
| Inflation | 8.345 | 8.660 | 28.100 | 0.800 | Annual percent change in the consumer price index | World Bank, WDI database |
| GDP growth | 2.255 | 2.604 | -2.100 | 6.500 | Annual percent change in real GDP per capita at constant 2015 US dollars | World Bank, WDI database |
| Public debt | 52.332 | 25.282 | 19.100 | 99.100 | Ratio of public debt to GDP | Ali Abbas et al. (2011); IMF, WEO |
| Open | 71.467 | 30.758 | 33.900 | 131.100 | Ratio of imports plus exports to GDP | World Bank, WDI database |
| Exchange rate regime | 2.431 | 1.296 | 1.000 | 5.000 | The Ilzetzki et al. (2021) coarse grid categorization of exchange rate regimes, which ranges from 1 (least flexible) to 5 (most flexible). | Ilzetzki et al. (2021) |
| Government consumption | 16.074 | 4.997 | 31.506 |  | 2.926Ratio of general government final consumption expenditure to GDP. | World Bank, WDI database |
| Index of representative government | 0.609 | 0.242 | 0.988 | 0.000 | The index emphasizes contested and inclusive popular elections for legislative and executive offices. It is an aggregate of scores for credible elections, free political parties, elected government, effective parliament, and local democracy and inclusive suffrage. It is scaled to range from 0 (lowest score) to 1 (highest score). | Institute for Democracy and Electoral Assistance |
| Financial development | 58.251 | 40.810 | 304.575 | 1.166 | Ratio of bank credit to the private sector to GDP. | World Bank, WDI |
| Crisis | 0.091 | 0.287 | 0.000 | 1.000 | Dummy variable equal to 1 in a quarter of systemic banking crisis and zero otherwise.  | Nguyen et al. (2022) |
| *Note*: Unbalanced sample 1980-2018. WDI is the World Bank’s World Development Indicator database and IMF, WEO is the International Monetary Fund’s World Economic Outlook database. |

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| **TABLE 4** Panel regressions estimates for the effect of inflation targeting on income distribution |
|  | Pre-tax Gini | Post-tax Gini | Income share of top 1% | Income share of top 10% |
| IT adopter\*year of IT adoption |  0.323\*\*\* (0.123) |  0.581\*\*\* (0.142) |  1.234\*\*\* (0.160)  |  0.248\*\*\* (0.166) |  0.022\*\*\* (0.001) |  0.070\*\*\* (0.001) |  0.023\*\*\* (0.002) |  0.071\*\*\*(0.002) |
| Year of IT adoption |  0.092  (0.396) |  0.459 (0.358) | -0.232 (0.464) |  0.292 (0.405) | -0.011\*\*\* (0.002) | -0.008\*\*(0.003) | -0.013\*\*\* (0.006) | -0.007\*\* (0.005) |
| Growth of GDP per capita |  | -0.003 (0.010) |  | -0.008 (0.012) |  |  0.000 (0.000) |  |  0.001 (0.001) |
| Inflation |  |  0.042\*\*\*(0.001) |  |  0.060\*\*\* (0.011) |  |  0.059\*\*\* (0.011) |  |  0.050\*\*\*(0.010) |
| Government consumption |  | -0.031(0.020) |  |  0.005 (0.024) |  | -0.004\*\*\* (0.002) |  | -0.008\*\*\* (0.000) |
| Representative government |  | -0.225(0.412) |  | -0.212(0.467) |  |  0.013\*\*\* (0.004) |  |  0.013\*\*\* (0.005) |
| Trade openness |  |  0.002(0.002) |  |  0.012\*\*\*(0.002) |  |  0.001\*\*\* (0.000) |  |  0.002\*\*\*(0.000) |
| Financial development |  |  0.011\*\*\* (0.001) |  |  0.020\*\*\*(0.002) |  |  0.001\*\*\*(0.000) |  |  0.001\*\*\*(0.000) |
| Crisis |  |  0.134(0.147) |  |  0.211\* (0.165) |  |  0.001 (0.001) |  |  0.002 (0.002) |
| Intercept | 34.377\*\*\*(0.051) | 35.935\*\*\*(0.452)  | 45.821\*\*\*(0.056) | 44.123\*\*\*(0.522) |  0.125\*\*\*(0.000) |  0.122\*\*\*(0.004) |  0.413\*\*\*(0.000) |  0.400\*\*\*(0.006) |
| Adjusted R2 | 0.876 |  0.818 | 0.825 | 0.885 | 0.823 | 0.872 | 0.832 | 0.875 |
| Observations | 2,297 | 2,065 | 2,297 | 2,065 | 2,658 | 2,245 | 2,657 |  2,244 |
| *Note*: Panel least squares estimates with fixed effects. See Table 1 for the definitions of the variables. Series Winsorized at 10%.Robust standard errors in parenthesis. \*\*\* Significant at 1%; \*\* significant at 5%; \* significant at 10%. |

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| **TABLE 5** Probit estimates of propensity scores |
|  | Pooled sample | High-income countries | Lower-income countries |
| Inflation, lagged | -0.002(0.002) |  0.024\*\*\*(0.005) | -0.001(0.001) |
| Growth of GDP per capita  |  0.022\*\*(0.005) |  0.024\*\*(0.015) |  0.014(0.011) |
| Public debt to GDP | -0.011\*\*\*(0.001) | -0.016\*\*\*(0.001) | -0.004\*\*\*(0.001) |
| Trade openness | -0.006\*\*\*(0.001) | -0.003\*\*\*(0.000) | -0.012\*\*\*(0.001) |
| Exchange rate regime |  0.413\*\*\*(0.034) |  0.632\*\*\*(0.042) |  0.254\*\*\*(0.039) |
| Crisis |  0.175(0.121) |  0.253(0.189) |  0.042(0.152) |
| Intercept | -0.365\*\*\*(0.112) | -1.025\*\*\*(0.125) |  0.322\*\*(0.146) |
| Pseudo R2 |  0.178 | 0.289 | 0.154 |
| Observations | 2,218 | 1,123 | 1095 |
| Wald chi2(6) | 427.24(0.000) | 341.35(0.000) | 179.31(0.000) |
| *Note*: Robust standard errors are reported in parenthesis.\*\*\* Significant at 1%; \*\* significant at 5%; \* significant at 10%. |

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| **TABLE 6** Matching estimates of overall treatment effects using the pooled sample |
|  | Nearest Neighbor Matching | Three-Nearest Neighbor Matching |  | Radius Matching |  | Local Linear Regression Matching | Kernel Matching |
| Wide |  Medium | Narrow |
| Pre-tax Gini coefficient |  0.018\*\*\*(0.001) |  0.012\*\*\*(0.001) |  |  0.012\*\*\* (0.001) |  0.012\*\*\*(0.002) |  0.012\*\*\*(0.001) |  |  0.018\*\*\*(0.003) |  0.017\*\*\*(0.001) |
| Post-tax Gini coefficient |  0.016\*\*\*(0.001) |  0.014\*\*\*(0.001) |  |  0.016\*\*\*(0.001) |  0.016\*\*\*(0.001) |  0.016\*\*\*(0.001) |  |  0.016\*\*\*(0.002) |  0.017\*\*\*(0.003) |
| Top 1% share of income |  0.117\*\*\*(0.001) |  0.121\*\*\*(0.001) |  |  0.124\*\*\*(0.001) |  0.126\*\*\*(0.001) |  0.124\*\*\*(0.002) |  |  0.125\*\*\*(0.000) |  0.136\*\*\*(0.000) |
| Top 10% share of income |  0.128\*\*\*(0.010) |  0.157\*\*\*(0.001) |  |  0.147\*\*\*(0.000) |  0.153\*\*\*(0.000) |  0.154\*\*\*(0.000) |  |  0.171\*\*\*(0.001) |  0.171\*\*\*(0.001) |
| *Note*: A 0.06 fixed bandwidth and an Epanechnikov kernal are used for kernal and local linear regression matching. Bootstrapped standard errors for ATT are reported in parenthesis. \*\*\* Significant at 1%.  |

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| **TABLE 7** Matching estimates of overall treatment effects in high-income countries |
|  | Nearest Neighbor Matching | Three-Nearest Neighbor Matching |  | Radius Matching |  | Local Linear Regression Matching | Kernel Matching |
| Wide |  Medium | Narrow |
| Pre-tax Gini coefficient |  0.009\*\*\*(0.003) | 0.008\*\*\* (0.003) |  |  0.009\*\*\*(0.002) |  0.006\*\*\* (0.002) |  0.008\*\*\*(0.002) |  |  0.008\*\*\*(0.001) |  0.006\*\*\*(0.001) |
| Post-tax Gini coefficient |  0.010\*\*\*(0.002) |  0.010\*\*\*(0.001) |  |  0.013\*\*\*(0.003) |  0.011\*\*\*(0.002) |  0.011\*\*\*(0.003) |  |  0.010\*\*\*(0.001) |  0.010\*\*\*(0.002) |
| Top 1% share of income |  0.011\*\*\*(0.002) |  0.011\*\*\*(0.003) |  |  0.011\*\*\*(0.002) |  0.011\*\*\*(0.002) |  0.012\*\*\* (0.001) |  |  0.012\*\*\* 0.002) | 0.011\*\*\* (0.002) |
| Top 10% share of income |  0.011\*\*\*(0.001) |  0.010\*\*\*(0.001) |  |  0.013\*\*\*(0.002) |  0.013\*\*\* (0.001) |  0.015\*\*\*(0.002) |  |  0.015\*\*\*(0.002) |  0.015\*\*\*(0.001) |
| *Note*: A 0.06 fixed bandwidth and an Epanechnikov kernal are used for kernal and local linear regression matching. Bootstrapped standard errors for ATT are reported in parenthesis. \*\*\* Significant at 1%. |

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| **TABLE 8** Matching estimates of overall treatment effects in other (lower)-income countries |
|  | Nearest Neighbor Matching | Three-Nearest Neighbor Matching |  | Radius Matching |  | Local Linear Regression Matching | Kernel Matching |
| Wide |  Medium | Narrow |
| Pre-tax Gini coefficient |  0.033\*\*\*(0.001) |  0.035\*\*\*(0.002) |  |  0.035\*\*\*(0.001) |  0.035\*\*\*(0.001) |  0.035\*\*\*(0.002) |  |  0.032\*\*\*(0.001) |  0.031\*\*\*(0.001) |
| Post-tax Gini coefficient |  0.032\*\*\*(0.001) |  0.032\*\*\*(0.002) |  |  0.032\*\*\*(0.001) |  0.032\*\*\*(0.001) |  0.030\*\*\*(0.001) |  |  0.030\*\*\*(0.001) |  0.033\*\*\*(0.002) |
| Top 1% share of income |  0.042\*\*\* (0.002) |  0.042\*\*\* (0.002) |  |  0.043\*\*\*(0.001) |  0.042\*\*\* (0.002) |  0.044\*\*\* (0.001) |  |  0.041\*\*\* (0.003) |  0.041\*\*\* (0.003) |
| Top 10% share of income |  0.134\*\*\* (0.002) |  0.136\*\*\*(0.001) |  |  0.135\*\*\*(0.002) |  0.135\*\*\*(0.002) |  0.135\*\*\*(0.002) |  |  0.138\*\*\*(0.002) |  0.134\*\*\*(0.002) |
| A 0.06 fixed bandwidth and an Epanechnikov kernal are used for kernal and local linear regression matching. Bootstrapped standard errors for ATT are reported in parenthesis. \*\*\* Significant at 1%. |

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| **APPENDIX TABLE** Panel regressions estimates for the effect of inflation targeting on income distribution, non-Winsorized data |
|  | Pre-tax Gini | Post-tax Gini | Income share of top 1% | Income share of top 10% |
| IT adopter\*year of IT adoption |  0.133\*\*\* (0.051) |  0.234\*\*\* (0.009) |  1.348\*\*\* (0.132)  |  0.453\*\*\* (0.166) |  0.060\*\*\* (0.001) |  0.042\*\*\* (0.001) |  0.045\*\*\* (0.002) |  0.085\*\*\*(0.002) |
| Year of IT adoption |  0.035\*\*\* (0.003) |  0.012\*\*\* (0.003) | 0.212\*\* (0.102) |  0.182\*\*\* (0.021) | -0.032\*\*\* (0.001) | -0.012\*\*(0.002) | -0.065\*\*\* (0.002) | -0.004\*\* (0.001) |
| Growth of GDP per capita |  | -0.002 (0.012) |  | -0.005 (0.010) |  |  0.000 (0.000) |  |  0.001 (0.001) |
| Inflation |  |  0.084\*\*\*(0.001) |  |  0.081\*\*\* (0.012) |  |  0.078\*\*\* (0.011) |  |  0.055\*\*\*(0.011) |
| Government consumption |  | -0.021(0.020) |  |  0.004 (0.022) |  | -0.006\*\*\* (0.002) |  | -0.006\*\*\* (0.000) |
| Representative government |  | -0.123(0.543) |  | -0.229(0.567) |  |  0.025\*\*\* (0.002) |  |  0.023\*\*\* (0.004) |
| Trade openness |  |  0.001(0.002) |  |  0.019\*\*\*(0.002) |  |  0.001\*\*\* (0.000) |  |  0.001\*\*\*(0.000) |
| Financial development |  |  0.008\*\*\* (0.001) |  |  0.028\*\*\*(0.002) |  |  0.001\*\*\*(0.000) |  |  0.001\*\*\*(0.000) |
| Crisis |  |  0.134(0.147) |  |  0.271\* (0.123) |  |  0.001 (0.001) |  |  0.003 (0.002) |
| Intercept | 0.331\*\*\*(0.077) | 0.532\*\*\*(0.234)  | 0.654\*\*\*(0.021) | 0.765\*\*\*(0.022) |  0.415\*\*\*(0.000) |  0.412\*\*\*(0.000) |  0.424\*\*\*(0.000) |  0.475\*\*\*(0.006) |
| Adjusted R2 | 0.813 |  0.834 | 0.812 | 0.843 | 0.823 | 0.862 | 0.812 | 0.826 |
| Observations | 2,329 | 2,125 | 2,329 | 2,125 | 2,658 | 2,245 | 2,658 |  2,244 |
| *Note*: Panel least squares estimates with fixed effects. See Table 1 for the definitions of the variables.Robust standard errors in parenthesis. \*\*\* Significant at 1%; \*\* significant at 5%; \* significant at 10%. |

1. For example, Australia adopted IT in 1993. Accordingly, for Australia the variable $ITadoption$ takes the value of one in 1993 and zero in other years and $ITadopter$ takes the value of zero over 1980-1992 and one from 1993 to 2018. [↑](#footnote-ref-1)
2. (See, for example, Dehejia & Wahba (2002) for a more complete discussion. [↑](#footnote-ref-2)
3. These propensity score matching techniques are discussed in detail in Lin and Ye (2007). [↑](#footnote-ref-3)
4. The World Inequality Database is downloadable at: https://wid.world. [↑](#footnote-ref-4)
5. The classification by the World Bank of countries into income categories has evolved significantly. Of the countries in our sample, 6 of the 31 inflation targeters (Chile, Czech Republic, Hungary, Korea, Poland, Uruguay) and 3 of the non-inflation targeters (Lithuania, Portugal, Slovak Republic) graduated into the high-income classification. [↑](#footnote-ref-5)
6. We Winsorized at 10% mainly because of extreme values with respect to inflation rates in some countries. However, we also ran estimates with data Winsorized at 1% and 5%, which did not change our overall conclusions. Similarly, broadly similar conclusions are reached from estimates using non-winsorized data as can be seen from the results reported in the appendix table. [↑](#footnote-ref-6)
7. In the Appendix Table we present results from non-winsorized data from which the results are broadly similar. [↑](#footnote-ref-7)
8. See, for example, Mishkin and Savastano (2001) and Truman (2003) on the conditions suited to IT adoption. [↑](#footnote-ref-8)