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Targeting inflation targeting: the influence of interest groups

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Abstract
We examine whether sectional interest groups influence monetary policy goals in a manner consistent with their interests as distributive coalitions. In particular, we explore whether bank groups and labor groups are associated with the incidence of inflation targeting by the central bank. Controlling for a variety of economic and institutional factors, our main findings reveal that bank groups are associated with a higher probability that a country is an inflation-targeter while labor groups are associated with a lower probability. The findings are conditional on the level of democracy and on aspects of central bank independence.

Keywords Monetary policy · Inflation targeting · Special interests

JEL classification P16 · E52 · E58

1 Introduction

Central banks may use monetary policy to pursue multiple goals. At any one time, they may have objectives regarding inflation, employment, interest rates, or financial sector stability. The goals may sometimes be in tension. As a result, policy decisions may produce distributional conflict among competing interest groups. Prior literature links interest groups to various aspects of fiscal policy, from total spending (e.g., Mueller & Murrell, 1986) and spending allocations (e.g., Singhal, 2008), to regulatory powers (e.g., Knittel, 2006). Monetary policy has received less attention, but arguably also is subject to interest group pressures. Fernández-Albertos (2015) provides an overview of the political nature of central banks and political economy explanations for independence from the central government, which alters but does not eliminate outside influence or the possibility of capture. We contribute to the growing number of studies that explore links between monetary policy and distributional coalitions. In particular, we examine whether sectional interest groups "target inflation targeting" and influence whether a central bank is an inflation-targeter.

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Relatedly, Salter and Luther (2019) ask, "What or who governs central bank decisions?" Their focus is on central bankers and the dependence of their decisions on institutions. Our focus is on interest groups and whether they influence monetary policy goals. At the most fundamental level, Wagner (1986) argues that central banking itself may exist not as a means to the end of addressing market failures associated with free banking, but as the product of a rent-seeking political process driven by special interests. Posen (1993) also argues that the institutions of central banking provide evidence of the influence of sectional pressures, though de Haan and van't Hag (1995) find only limited support for Posen's claim.

In the context of the currency crises of the 1990s, and earlier during the interwar era, Drazen (2000) and Wandschneider (2008), respectively, implicate banking and constituent interests in decisions to abandon fixed exchange rate regimes in order to expand monetary policy options. In the case of the United States, Anderson et al. (1988) implicate rent seeking banks in the Federal Reserve's tight monetary policy over the 1929–1933 period. More recently, Blau (2017) argues that political connections affected banks' participation in the US Federal Reserve's emergency programs during the 2009 global financial crisis. We build on this groundwork in two key regards. First, we identify opposing distributional coalitions with respect to monetary policy goals. Second, we directly examine whether these coalitions are empirically tied to a greater likelihood of policy that reflects their preferences.

Our work is loosely related to partisan theory, although our focus is on sectional interests rather than political partisans. In both classical (e.g., Hibbs, 1977, 1987, 1994) and rational expectations-augmented partisan theory (e.g., Alesina, 1987; Chappell & Keech, 1986) political parties are presumed to push policies that reflect the preferences of their supporters. In particular, parties of the left are presumed to appeal to a labor base, and therefore push policies that produce lower unemployment (at the possible expense of higher inflation). Parties of the right are presumed to appeal to a base of wealthier capital owners, and therefore push policies that produce lower inflation (at the possible expense of higher unemployment). A substantial amount of evidence is consistent with partisan theory. Potrafke (2017) provides a general overview of empirical evidence from OECD panel studies. He notes that while strong partisan effects were identified early on, effects lessened starting in the 1990s but still persist. In the particular case of the United States, Grier (1991, 1996) finds that monetary policy is influenced by congressional banking committee leadership along predicted partisan lines; Abrams and Iossifov (2006) link monetary policy to shared partisan affiliations of the Fed chair and incumbent president.

Conceivably, the association of politicians of particular parties with monetary policy may reflect different understandings or appropriate oversight pressure rather than the influence of interest groups. For example, Hess and Shelton (2016) find evidence that monetary policy is responsive to credible congressional threats through bills concerning Fed powers, but suggest that threats are motivated by congressional perceptions that the Fed is failing to perform its duties, rather than by purely partisan considerations. Our work directly examines whether sectional interests are linked to inflation targeting, and thus avoids the potential confounding influences of politicians' multiple motivations. Our direct approach also admits the possibility that sectional pressures influence monetary policy through non-governmental channels. In addition, while much of the prior literature on monetary policy and interest groups focuses on financial sector interests, we consider both labor groups and bank groups.

The normative implications that pressure groups play a role in the goals of monetary policy are potentially significant. According to Bernanke (2010), "a broad consensus has

emerged…that the goals of monetary policy should be established by the political authorities." As de Haan et al. (2018) put it, "central banks should have instrument independence and should be accountable as well." In other words, while central banks should be *instrument-independent from* political authorities they should be *goal-dependent on* political authorities, that is, dependent with respect to predetermined, long-run goals that reflect encompassing interests, and accountable to political authorities for achieving those goals. A key rationale for goal dependence and accountability is that "basic democratic principles argue for the government setting the goals of monetary policy" (Mishkin, 2011). Lurking here is an assumption that goals set by government will reflect the broad interests of the society that said government represents or rules. Government may, however, fail on that account. For example, collective action problems (Olson, 1965) may imply that some interests are excluded, and other interests end up with outsized influence on the determination of monetary policy goals. If that is the case—if sectional pressures influence monetary policy goals—then efforts to make central banks accountable for achieving those goals may not be sufficient to ensure that monetary policy reflects the broad interests of society. Moreover, whether or not a central bank is goal dependent or independent, evidence that certain groups wield influence may suggest a need for institutional reform that especially seeks to limit the extent to which narrow coalitions may exert influence on central bankers or politicians, to the potential detriment of more encompassing interests that are unheard.

With respect to monetary policy goals, and as explicated below in Sect. 2, we hypothesize that bank groups favor inflation targeting while labor groups oppose it, owing to distributional effects.

Consistent with these hypotheses, our findings reveal that bank groups are associated with a higher probability that a country is an inflation-targeter while labor groups are associated with a lower probability. The findings are conditional in two regards. First, they do not apply at relatively high levels of democracy, suggesting a sense in which democracy may be "working". Second, they are conditional on the level of central bank independence, suggesting a sense in which independence may be "working".

The remainder of the paper is organized as follows: In Sect. 2, we briefly discuss inflation targeting and the logic of our hypotheses. In Sect. 3, we describe the data and method used to estimate the relation between interest groups and inflation targeting. In Sect. 4, we present the main findings. In Sect. 5, we report additional results and sensitivity analyses. In Sect. 6, we offer concluding remarks.

2 Determinants of inflation targeting

New Zealand commonly is cited as the first inflation-targeter, with adoption in 1989. As of 2008, Samarina and de Haan (2014) list 28 central banks that consider themselves to be inflation-targeters. In the empirical analysis that follows, we categorize only those "officially" designated nations as inflation-targeters. It is notable, though, that "unofficial" inflation targeting is common. The economic factors that determine whether or not a nation's central bank officially engages in full-fledged inflation targeting have been explored well in the literature. Samarina and de Haan (2014) provide one of the most recent examples and summaries, finding that macroeconomic factors (inflation, GDP volatility, exchange rate regime and volatility), fiscal factors (government debt), external factors (trade openness), and financial factors (financial sector structure and level of development) all play roles in the probability that a nation's central bank is an official inflation-targeter.

In addition to economic factors, a number of authors also have explored the institutional determinants of inflation targeting. Central bank independence, the political coloring of government, political polarization and fractionalization, as well as checks and balances in the political system all have been linked to inflation targeting (Lucotte, 2010; Mukherjee & Singer, 2008; Samarina & de Haan, 2014). Our work is in a similar vein, as we also examine an institutional determinant of inflation target adoption—sectional interest groups, bank and labor groups, in particular. In contrast to prior literature, our focus is on the potential role of non-governmental institutions.

Partisan theory suggests a relation between political parties and economic policies related to distributional asymmetries. Likewise, our intuition regarding the preferences of bank groups and labor groups with respect to inflation targeting is driven by their presumed interests as distributional coalitions. In the context of partisan theory, Hibbs (1977, 1979) suggests that white-collar conservatives are relatively averse to inflation, blue-collar and progressive groups are relatively averse to unemployment. We suggest similar preferences for banking interests and labor interests, respectively.

Consider, first, banking interests. As net creditors, conventional wisdom suggests that the sentiments of banks naturally are anti-inflationary (Posen, 1993). In addition, we note that Friedman-Ball effects may lead banks to prefer relatively low inflation. The Friedman-Ball hypothesis (Ball, 1992; Friedman, 1977) implies that inflation uncertainty is increasing in inflation. Golub (1994) reports that the "vast majority of the research" supports the Friedman-Ball hypothesis. Hartmann and Herwartz (2012) offer more recent evidence in support of the hypothesis. Jawadi et al. (2020) do as well, though not during periods of crisis. To avoid the volatility of earnings associated with unexpected inflation, banks thus may prefer relatively low levels of inflation. High inflation and inflation uncertainty also may lead households to shift out of financial assets and into tangible assets, thus reducing the loanable funds available to financial intermediaries. As Schwartz (1995) claims, "Price level stability is essential for financial stability."

Empirical evidence on the relation between inflation and bank profits is mixed. Demirgüç-Kunt and Huizinga (1999) find that bank profits are increasing in inflation, though the significance of the results is weak. In contrast, Le and Ngo (2020), Kohlscheen et al. (2018) and Petria et al. (2015) find no relation between inflation and bank profits in panel studies. Ghosh (2016) finds an inverse relation. Ayadi et al. (2016) find an inverse relation between inflation and bank operating efficiency. These findings suggest that even if inflation may sometimes increase profits, the positive effect is likely insufficient to compensate for higher profit volatility. We therefore expect banking interests to be inflation-averse.

What about bank groups and GDP growth? To the extent that a short-run tradeoff between inflation and increasing growth exists when output is below potential, if bank interests benefit more from growth than they do from low and stable inflation, they may prefer a central bank that targets both inflation and GDP rather than one that prioritizes inflation.[1] Kohlscheen et al. (2018) and Demirgüç-Kunt and Huizinga (1999) find that GDP growth is not related to bank profitability. Claessens et al. (2018) conclude the growth-profit relation either is insignificant or negative. On these accounts, the downside of higher

[1] A short-run tradeoff between inflation and unemployment is inconsistent with divine coincidence—equivalency between stabilizing inflation and stabilizing the welfare-relevant output gap. However, in theory, several reasons can be found for being skeptical of such a coincidence, including real wage rigidities or information problems. Moreover, a key feature of the forecasting toolkit of economists and central (and other) bankers alike is its absence (e.g., Morett et al., 2019; Belinga and Doukali 2019).

levels and volatility of inflation is not likely to be offset by any short-run GDP growth upside. We therefore expect banks to prefer monetary policy goals that focus on inflation concerns.

Consider, second, labor groups. We suppose that their main constituency is blue-collar workers. We further suppose that the incomes of those individuals derive primarily from work (rather than financial or physical assets), making them especially sensitive to economic downturns and periods of unemployment. In contrast to banks, we therefore expect labor groups to favor monetary policy goals that are attentive to output growth. What about labor groups and inflation? To the extent that a short-run tradeoff between inflation and faster growth exists when output is below potential, might workers be damaged more by inflation than helped by a less likely or shorter period of unemployment? Given that their primary income source is from work, that possibility seems unlikely, even if workers generally are harmed rather than helped by inflation. In addition, workers may benefit from inflation to the extent they are beneficiaries of public seigniorage revenues.

In sum, we expect bank groups to prioritize inflation objectives while labor groups prioritize unemployment-related objectives. Inflation targeting is one way a central bank might express commitment to prioritizing inflation objectives and be perceived as less attentive to unemployment concerns. We therefore hypothesize that.

Proposition 1 The greater is the influence of banking groups, the greater is the pressure to prioritize inflation objectives, and therefore the higher is the probability that a country is an inflation-targeter.

And

Proposition 2 The greater is the influence of labor groups, the greater is the pressure to prioritize unemployment-related objectives, and therefore the lower is the probability that a country is an inflation-targeter.

3 Data and methods

We explore whether sectional pressure groups relate to a central bank's inflation targeting status by estimating the following probability model,

$$E\left(Target_{i,t}\right) = F\left(\beta_1 Bank\ Groups_{t-1}, \beta_2 Labor\ Groups_{t-1}, \gamma' \boldsymbol{X}_{i,t-1}, \lambda t, \mu_t\right),$$

where *F(·)* is the normal distribution, *Target* indicates whether a country is an inflation-targeter (taking the value one) or not (taking the value zero); *Groups* is a measure of sectional pressures either in the banking sector or in support of labor; t is a linear time trend; $\boldsymbol{X}$ is a vector of additional explanatory variables; β_1, β_2, and λ are parameters to be estimated; $\boldsymbol{\gamma}$ is a vector of parameters to be estimated; μ is an unobserved random effect; and i indexes countries. Independent variables are lagged one year, reflecting an assumption that a country's status as an inflation-targeter or not at t reflects a decision based on information and events at t-1. We estimate the model by probit, using STATA 15 and the xtprobit and margins commands.

The dataset includes annual observations over the 1985–2008 period for 154 countries. A country list along with descriptions and sources for all variables are provided in the Appendix.

Table 1 Summary statistics

	Mean	SD	Minimum	Maximum
Bank groups				
Raw count	4.167	14.708	0	140.000
Share of GDP/cap × 1000	0.983	2.104	0	24.165
Labor groups				
Raw count	11.998	24.387	0	224.000
Share of GDP/cap × 1000	5.366	12.294	0	131.652

To determine whether a country is an inflation-targeter in a given year, we use the target adoption dates provided in Samarina and de Haan (2014). Of the 154 countries in the sample, 30 were inflation-targeters at some point during the sample period. Of those 30, two (Finland and Spain) abandoned inflation targeting during the sample period owing to the start of the European Economic and Monetary Union. The rest remained inflation-targeters for the duration of the sample. At the maximum, the sample contains 2648 observations, of which 245 observations (9.3% of the sample) represent instances of inflation targeting.

The independent variables of primary interest are proxies for sectional pressures on the banking sector and on support for labor—the number of banking sector groups and the number of labor groups in a country as shares of real GDP per capita. The normalization of raw group counts by real GDP per capita reflects the assumption that a given number of groups exerts more influence in a poorer country than in a richer country. Groups accumulate in greater numbers in wealthier economies (Coates et al. 2007). Olson's (1965) theory of collective action suggests that the explanation for the wealth effect may be found in the selective incentives necessary for individuals to coalesce into groups are easier to marshal in richer rather than poorer settings. In turn, in poorer settings, where selective incentives are more costly to provide, the existence of groups suggests expectations of influence as the main driver of group formation.

The primary source for the group counts is the *World Guide to Trade Associations*. Aggregate group counts from the *Guide* have been used in a number of prior studies (see, for example, Murrell, 1984; Heckelman, 2000; Bischoff, 2003). To our knowledge, ours is the first study to use disaggregated, sector-specific counts. The *Guide* has been published six times, in 1973, 1980, 1985, 1995, 1999 and 2002. Using the four most recent editions, we count the number of banking sector groups and the number of labor groups as of 1985, 1995, 1999 and 2002 for each country in the sample and rely on those counts (normalized by real GDP per capita) as measures of sectional pressure. Counts are not available annually. To construct an annual series, we use counts from the 1985 edition for each year in the 1985–1994 period, counts from the 1995 edition for each year in the 1995–1998 period, counts from the 1999 edition for each year in the 1999–2001 period, and counts from the 2002 edition for each year in the 2002–2008 period. Summary statistics for the group counts are reported in Table 1. Labor groups are more numerous than bank groups, on average, and for all but 209 of the 2648 observations. Zero bank groups are observed in many cases (1155 observations), while zero labor groups are observed only in a few of them (348 observations). The maximum number of both labor groups and bank groups occurs in the United States.

We enter a wide array of control variables in the analysis, drawn largely from earlier studies of inflation targeting determinants, including Mukherjee and Singer (2008), Lucotte (2010) and Samarina and de Haan (2014). See the Appendix for a table that displays the

variables used in these analyses, significance of findings, and expected signs. In addition to the group counts, our most parsimonious specification includes several political economy controls, including central bank independence, political polarization as well as governmental checks and balances, and a measure of democracy.

We then add a control for fiscal conditions (central government debt), as well as controls for external exposure (openness to international trade and capital account openness), and controls for financial sector characteristics (a measure of private credit and a financial crisis indicator). Next, we add controls for macroeconomic conditions (inflation, GDP, growth, growth volatility, exchange rate volatility and exchange rate regime type).

As indicated in the model specification above, all explanatory variables are lagged one year. In other words, the model supposes that the decision to target inflation in year *t* is based on the values of the explanatory variables observed in the previous year, *t-1*. The specification further supposes that a country's decision to target inflation at time *t* is independent of its status as an inflation-targeter at time *t-1*. Samarina and de Haan (2014) estimate a similar model, but their approach differs from ours in a key regard. In particular, they frame their analysis in terms of a country's initial decision to adopt inflation targeting, which they suggest is distinct from a decision to continue inflation targeting once it has been adopted. As a result, once a country becomes an inflation-targeter, they drop all subsequent observations for that country. In contrast, we use the full sample of observations (as do Svensson, 2000; Mukherjee & Singer, 2008; and Lucotte, 2010). That approach captures decisions to adopt inflation targeting, to continue inflation targeting, and to abandon inflation targeting. It does further suppose that such decisions are influenced by similar factors, contrary to the suggestion of Samarina and de Haan.

Our approach is driven further by the nature of the available interest group data. As noted earlier, raw group count data are available only episodically, and we construct annual series by repeating the counts observed in one year until a new count is available. If the availability of the raw group data coincided with the adoption of inflation targeting in every case, we could utilize the approach of Samarina and de Haan and examine whether groups explain the initial adoption of inflation targeting as well as the subsequent incidence of inflation targeting. Unfortunately, it does not. As such, we include all available observations in the main analysis, and examine whether groups explain the incidence of inflation targeting regardless of whether inflation targeting was adopted earlier or not.

A potential specification-related concern is endogeneity of some of the control variables, especially controls for macroeconomic conditions. For example, the inflation rate observed at *t-1* may reflect inflation expected at *t*, which may in turn be influenced by a country's status as an inflation-targeter or not at *t*. As such, endogeneity bias may be a concern, as inflation at *t-1* may both determine and be determined by a country's status as an inflation-targeter or not at *t*. Other macroeconomic control variables similarly may be endogenous, although inflation seems the most likely to be so affected.

Our primary interest is not in the relation between macroeconomic indicators (or other control variables) and the decision of whether or not to target inflation. However, if the data generating processes imply that the estimated marginal effects of macroeconomic variables may be biased, that bias could spread to the estimated marginal effects of our main variables of interest. In particular, if the estimated marginal effects of macroeconomic variables are biased because of endogeneity, the estimated marginal effects of bank and labor groups remain unbiased only if bank and labor groups are uncorrelated with macroeconomic variables. Reasons exist for thinking that groups may be correlated with macroeconomic outcomes. Olson's (1982) theory of institutional sclerosis and related empirical evidence links groups and growth as well as groups and growth volatility (Heckelman & Wilson, 2014).

Furthermore, the hypotheses of the present paper suppose that certain groups have preferences regarding inflation outcomes and may seek to influence policy accordingly. If those efforts are successful, groups may be correlated with inflation. The impact of groups on macroeconomic outcomes (or other control variables) may operate with a sufficient lag so as not to be contemporaneous. However, if a contemporaneous correlation exists, and if any of those control variables are endogenous to a country's status as an inflation-targeter or not, then the estimated marginal effects of groups may be biased.

A few options are available for dealing with endogenous regressors in the context of binary choice models, including control-function-based estimation and special regressor estimators. However, control function estimators require a correctly specified first-stage model for consistency. Special regressor estimators require an appropriate set of instruments as well as a special regressor with particular properties. The demands of those methods are not likely to be met, so it is not clear that they will generate more reliable results. We therefore rely on probit estimation with random effects, and stress that the findings should be treated with some caution because of the possibility of endogeneity biased estimates. In addition, we examine several specifications, some of which exclude the variables most likely to be endogenous. Those parsimonious specifications may suffer from omitted variables bias, but assuming that their impact is not similar to any impact of potential endogeneity, a comparison of findings across specifications may offer some insight into whether the findings reflect substantial endogeneity bias or not.

4 Findings

The main findings are reported in Table 2 and include three specifications ranging from most parsimonious to most inclusive. The estimates reported are average marginal effects (with p values in parentheses). All specifications include the explanatory variables of primary interest—Bank Groups and Labor Groups—as well as a linear time trend. The estimated marginal effects of Bank Groups and Labor Groups are reported in the top rows of the table. In all three specifications, the effects are consistent with the two hypotheses stated in Sect. 2, indicating that countries with more bank groups relative to GDP per capita are more likely to be inflation-targeters and countries with more labor groups relative to GDP per capita are less likely to be inflation-targeters.[2] The magnitudes of the estimated effects of both Bank Groups and Labor Groups are relatively stable across all three specifications. The estimates in the first two columns are the most likely to reflect omitted variables bias, while the estimates in the last column are the most likely to reflect bias inherited from correlations with potentially endogenous controls for macroeconomic conditions. It seems unlikely that any potential omitted variables bias is coincidentally comparable to any potential inherited bias associated with endogeneity. As a result, the similar estimated marginal effects across the specifications give us some confidence that the findings do

[2] For categorical variables, the marginal effect indicates how the probability that a country is an inflation-targeter changes as the categorical variable changes from 0 to 1. For continuous variables, such as Bank Groups and Labor Groups, the marginal effect yields an instantaneous rate of change. It is common to imagine that marginal effects in probability models must range between 0 and 1. However, that is not the case here. The marginal effect is the slope of the prediction function, which can be greater than one even if the values of the function are between 0 and 1.

Table 2 Main findings

Bank groups	10.778 (0.015)	14.338 (0.000)	14.820 (0.043)
Labor groups	−8.412 (0.003)	−9.210 (0.000)	−7.115 (0.014)
CBI – ceo	−0.025 (0.468)	−0.053 (0.035)	−0.033 (0.464)
CBI – policy	−0.179 (0.000)	−0.207 (0.000)	−0.136 (0.000)
CBI – objective	0.140 (0.000)	0.165 (0.000)	0.100 (0.005)
CBI – lending limits	0.109 (0.000)	0.127 (0.000)	0.116 (0.001)
Political polarization	0.005 (0.224)	0.005 (0.139)	0.018 (0.010)
Checks and balances	0.007 (0.005)	0.007 (0.001)	0.010 (0.015)
Democracy	0.015 (0.000)	0.018 (0.000)	0.019 (0.000)
Openness		−0.001 (0.000)	−0.001 (0.018)
Private credit		−0.001 (0.000)	−0.000 (0.054)
Financial crisis*		0.018 (0.035)	0.019 (0.253)
Inflation			−0.543 (0.000)
GDP			0.000 (0.000)
Growth volatility			−0.005 (0.082)
Exchange rate regime* (2)			0.054 (0.000)
Exchange rate regime* (3)			0.105 (0.000)
Exchange rate regime* (4)			−0.068 (0.000)
Observations/countries	2648/154	2371/151	1923/139

A random effects probit model is estimated. Dependent variable is a dummy that takes the value 1 for inflation targeters and 0 otherwise. Independent variables are lagged one year. Estimates are average marginal effects (*p* values in parentheses). * indicates a dummy variable for which the discrete change from the base level is reported. Specifications also include a time trend, which is positive in sign and statistically significant in all cases. In addition, the second and third specifications include Government Debt and Capital Account Openness and the third includes Growth and Exchange Rate Volatility. Estimates for these variables are omitted to conserve space and because they are not statistically significant

indeed reflect an influence of Bank Groups and Labor Groups on decisions to target inflation or not.

The estimated marginal effect of the time trend is not reported in the table because of space constraints but is positive and statistically significant in all three specifications. Coefficient estimates for the other control variables generally are consistent with expectations. Owing to space constraints and because those variables are treated elsewhere in the literature, we do not discuss them here.

Although we control for central bank independence, a reviewer expressed skepticism "that partisan considerations play an important role in monetary policies of independent central banks." Some evidence has been reported that central bank independence insulates monetary policy from partisan politics. For example, Way (2000) and Belke and Potrafke (2012) find evidence that the influence of partisan politics is conditional on central bank independence. In contrast, though, using a dynamic heterogenous panel, Giesenow and de Haan (2019) do not find that government ideology affects monetary policy. On one hand, evidence that central bank independence insulates monetary policy from partisan politics suggests that it also insulates central bankers from sectional pressures, especially to the extent they operate through political channels. On another hand, Gabillon and Martimort (2004) point out that a central bank that is insulated from government bodies may still find itself captured by private pressure groups. Indeed, Friedman did not favor central bank

independence, in part because he worried that central bankers would be captured by bankers (and he trusted neither set of characters) (Schwartz, 2009). If central bank independence (as captured by the measures we use) does indeed insulate monetary policy strategy from sectional pressures, then the average marginal effects of Bank and Labor Groups reported in Table 2 may mask conditional effects that depend on the level of central bank independence. We therefore we re-estimate the fullest specification in Table 2 but allow the impact of Bank Groups and Labor Groups to vary, depending on the level of central bank independence.

Our analysis examines four components of central bank independence—one related to the appointment, dismissal, and term of office of the chief executive officer of the bank (CEO), another related to conflicts with the executive branch and fiscal policy (Policy), another related to the bank's objectives (Objectives), and another related to bank lending to the public sector (Lending limits). The components are each positively and statistically significantly correlated with one another. However, the correlations are not especially high, at 0.439 (between CEO and Policy), 0.391 (between CEO and Objectives), 0.260 (between CEO and Lending limits), 0.423 (between Policy and Objectives), 0.578 (between Policy and Lending limits), and 0.324 (between Objectives and Lending limits). We examine the interactions between Bank Groups and Labor Groups and each of the four components of central bank independence. The estimated conditional marginal effects are reported in Table 3. In Table 4, we report the number of observations that fall within various ranges of the values the central bank independence measures can take. The findings indicate that the impact of sectional pressures indeed is conditional on the level of central bank independence.

The estimated effects are most consistent with the hypothesis that central bank independence insulates monetary policy from sectional pressures in the cases of the CEO and Objectives components. For the two of them, at all but the highest levels of central bank independence, the marginal effects of both Bank Groups and Labor Groups decline in magnitude as the level of independence rises. At the highest level of independence, the marginal effects of both Bank and Labor Groups have the signs opposite to those predicted. For the CEO component, in the case of Bank Groups, the flipped relation is statistically significant only for a level of independence that applies to roughly 10 observations and two countries—Costa Rica and Ecuador. In the case of Labor Groups, the flipped relation is statistically significant for a level of independence that applies to nearly 180 of the total 1923 observations and 12 countries. Among those, Canada is the only developed country. For the Objective component, in the case of Labor Groups, for the highest level of independence, a statistically significant relation is found that is not of the expected sign. A total of 92 observations and 12 countries are characterized by that highest level of independence at some point during the sample period.

In the case of the Policy component of central bank independence, the marginal effects of Labor Groups are consistent with the hypothesis that independence insulates monetary policy from sectional pressures and also have the hypothesized negative sign. The estimated magnitude of the effect diminishes as the level of independence rises and is statistically significant only for levels of independence less than 0.50. In contrast, Bank Groups are statistically significantly related to inflation targeting only at a relatively high level of independence, ranging from 0.66 to 0.86. Some 384 observations in the sample are characterized by levels of independence in the Policy component in that range. Over that range, the marginal effect increases from 9.320 to 10.334.

In the case of the Lending Limits component of central bank independence, the estimated conditional marginal effects are not consistent with the hypothesis that central bank

Table 3 CBI and conditional marginal effects

	CEO		Policy		Objectives		Lending limits	
	Bank groups	Labor groups	Bank groups	Labor groups	Bank groups	Labor groups	Bank groups	Labor groups
CBI level								
0.0	100.720 (0.007)	− 55.091 (0.004)	0.869 (0.973)	− 13.503 (0.038)	43.620 (0.002)	− 24.789 (0.004)	− 22.312 (0.151)	− 3.242 (0.431)
0.2	74.386 (0.000)	− 40.270 (0.000)	4.784 (0.774)	− 9.418 (0.035)	36.217 (0.000)	− 19.955 (0.001)	− 14.143 (0.211)	− 3.643 (0.299)
0.4	41.045 (0.000)	− 21.685 (0.000)	7.828 (0.456)	− 6.148 (0.051)	28.730 (0.002)	− 14.999 (0.002)	− 3.259 (0.705)	− 4.277 (0.090)
0.6	13.477 (0.048)	− 6.255 (0.009)	9.110 (0.138)	− 3.131 (0.209)	21.148 (0.005)	− 9.814 (0.001)	13.381 (0.055)	− 5.378 (0.035)
0.8	− 14.756 (0.0195)	9.767 (0.000)	10.037 (0.095)	− 1.133 (0.658)	12.213 (0.154)	− 3.518 (0.117)	37.248 (0.001)	− 6.339 (0.251)
1.0	− 45.538 (0.036)	27.060 (0.001)	10.027 (0.151)	0.291 (0.911)	− 0.249 (0.983)	5.399 (0.091)	68.780 (0.002)	− 7.309 (0.432)

A random effects probit model is estimated. Dependent variable is a dummy that takes the value 1 for inflation targeters and 0 otherwise. Specifications include all control variables listed in Table 2 as well as a time trend. Estimates are marginal effects of Bank Groups and Labor Groups conditional on the level of CBI (p values in parentheses)

Table 4 CBI observation counts

	CEO	Policy	Objectives	Lending limits
[0, 0.1]	72	270	162	57
(0.1, 0.2]	41	218	0	194
(0.2, 0.3]	50	196	106	258
(0.3, 0.4]	120	60	0	222
(0.4, 0.5]	324	163	339	230
(0.5, 0.6]	533	244	0	226
(0.6, 0.7]	207	96	796	222
(0.7, 0.8]	397	287	0	192
(0.8, 0.9]	178	19	428	52
(0.9, 1.0]	1	370	92	270

Figures are the number of observations with CBI levels that fall into the ranges indicated in the first column

independence insulates monetary policy from sectional pressures. In the case of Bank Groups, the marginal effects are statistically significant only at higher levels of independence and are increasing in magnitude. A similar effect is identified for Labor Groups, but occurs only for levels of independence between 0.40 and 0.72.

Taken overall, the findings in Table 3 clearly indicate that the impact of interest groups on monetary policy is conditional on central bank independence. The marginal effects tend to be diminishing in independence, but exceptions exist. Likewise, most of the observations in the sample correspond to levels of bank independence such that, when conditional effects are statistically significant, they are of the hypothesized sign—positive for Bank Groups and negative for Labor Groups..

5 Additional empirical results and sensitivity analysis

We conduct a number of additional experiments to gauge the sensitivity of the main findings that Bank Groups are associated with a greater likelihood of inflation-targeting and that Labor Groups are associated with a lesser likelihood of inflation-targeting. Results are reported in Table 5. Only estimates for Bank Groups and Labor Groups are shown, but the specifications are analogous to the fullest specification in Table 2. We first examine whether the main findings are conditional on the level of democracy. The main findings reflect average marginal effects. For ease of comparison, the findings from Table 2 are indicated in the top row of the first two columns. Below those main findings, we report marginal effects conditional on the level of democracy. The level of democracy ranges from 1 to 7 (measured by the Freedom House political rights index, reversed so that that 1 = least democratic and 7 = most democratic). The number of observations associated with each level is indicated in parentheses. Notably, nearly 40% of the observations (753) have the highest level of democracy. For Bank Groups, the conditional marginal effects are of the expected sign in all cases but are not statistically significant at the two highest levels of democracy examined. For Labor Groups, the conditional marginal effects likewise are of the expected sign in all cases but are not statistically significant at the highest level of democracy examined. The findings are consistent with the idea that democracy is "working" when it is at sufficiently high levels, in the sense that Bank Groups and Labor Groups

Table 5 Sensitivity analysis, average and conditional marginal effects

	Bank groups	Labor groups	5-year averages		Omit EMU obs	
			Bank groups	Labor groups	Bank groups	Labor groups
Average effects	14.820 (0.043)	−7.115 (0.014)	11.448 (0.137)	−6.056 (0.061)	10.744 (0.282)	−4.666 (0.145)
Democracylevel (obs.)						
1 (143)	15.794 (0.000)	−12.852 (0.001)	9.356 (0.049)	−6.410 (0.098)	15.905 (0.000)	−6.614 (0.070)
2 (235)	16.550 (0.004)	−13.392 (0.028)	10.603 (0.020)	−7.290 (0.044)	15.089 (0.001)	−6.614 (0.120)
3 (134)	18.256 (0.001)	−14.576 (0.002)	14.501 (0.018)	−10.110 (0.052)	13.580 (0.009)	−7.414 (0.035)
4 (178)	18.392 (0.000)	−14.576 (0.002)	14.501 (0.018)	−10.110 (0.052)	13.580 (0.009)	−7.414 (0.035)
5 (187)	15.324 (0.014)	−11.868 (0.000)	13.041 (0.017)	−9.234 (0.003)	8.187 (0.275)	−6.061 (0.015)
6 (293)	10.164 (0.234)	−7.453 (0.011)	8.538 (0.411)	−6.280 (0.249)	1.170 (0.914)	−4.144 (0.172)
7 (753)	4.237 (0.729)	−2.317 (0.598)	3.068 (0.873)	−2.850 (0.776)	−8.038 (0.640)	−1.941 (0.742)

A random effects probit model is estimated. Dependent variable is a dummy that takes the value 1 for inflation targeters and 0 otherwise. Specifications include all control variables listed in Table 2 as well as a time trend. Estimates are marginal effects of Bank Groups and Labor Groups conditional on the level of Democracy (p values in parentheses). In the "5-year Averages" columns, control variables are 5-year averages. In the "Omit EMU obs." columns, observations are omitted if a country joins the EMU

are not tied to the incidence of inflation targeting. We caution that the findings do not provide evidence that democracy is "working" more generally with respect to decisions about whether to inflation target (or not). Even if the two groups are not playing a role (or are playing offsetting roles), the decision to target inflation still may not be the result of a democratic process that reflects long-run, encompassing interests.

We next explore whether the findings change if we use five-year moving averages (rather than a single year) for the non-dichotomous macroeconomic control variables—Government Debt, Private Credit, Capital Account Openness, Inflation, GDP, Growth, Growth Volatility and Exchange Rate Volatility. We again examine both average marginal effects and marginal effects conditional on democracy. As the results in the "5-year Averages" columns indicate, with respect to the average marginal effects, the findings "weaken" in the sense that Bank Groups no longer are statistically significantly tied to inflation targeting, and for Labor Groups, the magnitude of the effect deteriorates. The marginal effects, however, tell a slightly different story. Bank Groups again are directly associated with inflation targeting for all but the highest two levels of democracy. The same is true for Labor Groups. For both Bank Groups and Labor Groups, the magnitude of the effect is highest at the democracy level of four.

We also explore whether the findings change if we omit certain observations. In particular, we omit observations if a country joins the European Economic and Monetary Union (EMU). The choice to join the EMU is an implicit choice not to target inflation. However, it does not solely represent that choice; that decision is multi-fold. Furthermore, joining (and continuing) the EMU is not an option available to all countries in the sample and clearly is not randomly assigned. As the results in the "Omit EMU obs." columns indicate, when those observations are dropped, the average marginal effects are not statistically significant. However, for Bank Groups, the conditional marginal effects are positive and statistically significant at all but the three highest levels of democracy. The conditional marginal effects for Labor Groups are negative and statistically significant, with the exception of the two highest levels of democracy and the second lowest level.

Overall, the findings of the above experiments suggest that the main results are driven by the roughly 46% of the sample observations that correspond to nations with levels of democracy below 6. In other words, Bank Groups and Labor Groups are tied to inflation targeting in countries where democracy comparatively is weak.

6 Concluding remarks

Our panel analysis of more than 100 countries over the 1985–2008 period indicates that sectional interest groups influence whether or not a nation's central bank is an inflation-targeter. In particular, bank groups are associated with a higher probability that a nation is an inflation-targeter, labor groups with a lower probability. Inflation targeting sometimes is viewed as a mechanism that insulates monetary policy from undue influence. Our findings suggest that the choice to target inflation itself may be influenced by sectional pressures. Notably, the findings are conditional on the level of democracy as well as on certain aspects of central bank independence, suggesting ways that institutions effectively may insulate policy from potentially inappropriate influence.

Sectional interest groups often are understood as acting as distributive coalitions—groups that seek to redistribute income in their favor through political and policy processes. Much of the related literature suggests that such redistribution takes place through

government transfers and regulation. As Mueller (2003, p. 354) puts it "The entire federal budget can be viewed as a gigantic rent up for grabs for those who can exert the most political muscle." For the case of the United States, Shughart et al. (2002) offer evidence that the distributive effects of groups operate primarily through off-budget channels, rather than through the size of government expenditures per se. Our findings suggest that monetary policy goals may be an additional channel through which groups influence the distribution of income. Indirectly, they further suggest the possibility of rent extraction by policy makers, à la McChesney (1987, p. 118), through monetary policy. McChesney observed that "There is no such thing as a free market," since threats of regulation may drive groups towards pro-active lobbying. Monetary policy may likewise serve as a source of rent extraction, if policy makers effectively blackmail groups using threats to impose or abandon inflation targeting.

To the extent that the goals of central banks should be encompassing, the evidence that banking and labor groups influence monetary policy goals suggests a potential need for reform of political and or central banking institutions that are not sufficiently democratic or independent in order to guard against undue influence in the determination of goals. It also suggests that institutions designed to encourage central bank accountability should be directed not only towards goal achievement but also towards the processes through which those goals are determined. To that end, additional research is needed. In particular, the argument and evidence presented here are directed towards determining whether sectional interest groups influence monetary policy (the incidence of inflation targeting in particular). We do not identify the channels through which such influence occurs. Future research should, for example, examine whether groups exert influence through political authorities or through connections within the central bank. Future research also might explore whether groups are linked to other aspects of inflation targeting (such as the particular inflation levels and allowable ranges around the target), or to other aspect of monetary policy (such a debt monetization or central bank lending rates or regulatory policies). In addition, while we focused on bank and labor groups as competing distributional coalitions, future research might examine whether other sectional interest groups influence monetary policy.

Beyond the identification of channels of influence, the findings suggest a number of additional questions that might be addressed by future research. In particular, the results indicate that influence is conditional on democracy and central bank independence. With respect to central bank independence, some components appear more important than others. Further investigation of those findings may illuminate the channels through which influence occurs. In addition, future research should examine whether various components of democracy are more important than others and, if so, consider what this might tell us about the channels of influence and the nature of reforms that might be most helpful.

Appendix

Country list (year of adoption/cessation in parentheses for inflation targeters)

Albania	El Salvador	Luxembourg	Singapore
Algeria	Eq. Guinea	Macedonia	Slovakia (2005)
Argentina	Estonia	Madagascar	Slovenia

Albania	El Salvador	Luxembourg	Singapore
Armenia (2006)	Ethiopia	Malawi	Solomon Islands
Australia (1993)	Fiji	Malaysia	South Africa (2000)
Austria	Finland (1993/1998)	Maldives	South Korea (1998)
Bahamas	France	Mali	Spain (1995/1998)
Bahrain	Gabon	Malta	Sri Lanka
Bangladesh	Gambia	Mauritania	St. Kitts and Nevis
Barbados	Georgia	Mauritius	St. Vincent and the Grenadines
Belarus	Germany	Mexico (2001)	Sudan
Belgium	Ghana (2007)	Moldova	Suriname
Belize	Greece	Mongolia	Sweden (1993)
Benin	Grenada	Morocco	Switzerland (2000)
Bolivia	Guatemala (2005)	Mozambique	Syria
Bosnia-Herz	Guinea	Namibia	Tajikistan
Botswana	Guinea-Bissau	Nepal	Tanzania
Brazil (1999)	Guyana	Netherlands	Thailand (2000)
Bulgaria	Haiti	New Zealand (1990)	Togo
Burkina Faso	Honduras	Nicaragua	Tonga
Burundi	Hungary (2001)	Niger	Trinidad and Tobago
Cambodia	Iceland (2001)	Nigeria	Tunisia
Cameroon	India	Norway (2001)	Turkey (2006)
Canada (1991)	Indonesia (2005)	Oman	Turkmenistan
Cape Verde	Iran	Pakistan	Uganda
CAR	Iraq	Panama	Ukraine
Chad	Ireland	Papua New Guinea	United Arab Emirates
Chile (1991)	Israel (1992)	Paraguay	United Kingdom (1993)
China	Italy	Peru (2002)	United States
Colombia (2000)	Ivory Coast	Philippines (2002)	Uruguay
Comoros	Jamaica	Poland (1999)	Uzbekistan
Congo, Dem. Rep	Japan	Portugal	Vanuatu
Congo, Rep	Jordan	Qatar	Venezuela
Costa Rica	Kazakhstan	Romania (2005)	Vietnam
Croatia	Kenya	Russia	Yemen
Cuba	Kuwait	Rwanda	Zambia
Cyprus	Kyrgyzstan	Saint Lucia	Zimbabwe
Czech Republic (1998)	Laos	Samoa	
Denmark	Latvia	San Marino	
Djibouti	Lebanon	Saudi Arabia	
Dominica	Lesotho	Senegal	
Dominican Rep	Liberia	Serbia	
Ecuador	Libya	Seychelles	

Albania	El Salvador	Luxembourg	Singapore
Egypt	Lithuania	Sierra Leone	

Variable definitions and data sources

The dataset is an unbalanced panel of a maximum 2648 annual observations that covers 154 nations over the period 1985–2008.

Dependent variable

Inflation Targeter: A dummy variable that takes the value one for inflation targeters, and zero otherwise. Inflation targeters are nations with a publicly announced numerical target for inflation. The main analysis uses the official adoption dates according to the central bank. Two alternative dates are considered in the sensitivity analysis: (1) soft inflation targeting (SIT) adoption and (2) full-fledged inflation targeting (FFIT) adoption. SIT is characterized by coexistence of an inflation target and other nominal anchors such as exchange rate pegs. FFIT entails an inflation target as the single nominal anchor. Source: Samarina and De Haan (2014), Table 1.

Independent variables

Bank Groups: The number of banking sector interest groups in a country as a share of real GDP per capita. Counts as of 1985, 1995, 1999, and 2002 are used, respectively, for the periods 1985—1994, 1995—1998, 1999—2001, 2002—2008. Source: Third through sixth editions of *World Guide to Trade Associations*.

Labor Groups: The number of labor interest groups in a country as a share of real GDP per capita. Counts as of 1985, 1995, 1999, and 2002 are used, respectively, for the periods 1985—1994, 1995—1998, 1999—2001, 2002—2008. Source: Third through sixth editions of *World Guide to Trade Associations*.

CBI—CEO: A component of central bank independence related to "the appointment, dismissal, and term of office of the chief executive officer of the bank…" (Cukierman et al. 1992). Source: Garriga (2016).

CBI—Policy: A component of central bank independence related to "the policy formulation cluster, which concerns the resolution of conflicts between the executive branch and the central bank over monetary policy and the participation of the central bank in the budget process." (Cukierman et al. 1992). Source: Garriga (2016).

CBI—Objective: A component of central bank independence related to "the objectives of the central bank." (Cukierman et al. 1992). Source: Garriga (2016).

CBI—Lending Limits: A component of central bank independence related to "limitations on the ability of the central bank to lend to the public sector…" (Cukierman et al. 1992). Source: Garriga (2016).

Central Bank Independence: A measure of central bank independence. Source: Garriga (2016). We use Garriga's weighted measure, which is based on the Cukierman et al. (1992) coding and weighting rules.

Political Polarization: A measure of polarization in government. Source: World Bank *Database of Political Institutions*, "polariz."

Checks and Balances: A measure of checks and balances in government. Source: World Bank *Database of Political Institutions*, "checks."

Democracy: A measure of political rights. Source: Freedom House political rights index (reversed so that 1 = least democratic and 7 = most democratic).

Exchange Rate Regime: A categorical variable that takes the values one, two, three, or four, for least flexible to most flexible exchange rate regime. Source: Ilzetzki, Reinhart, and Rogoff (2017), "coarse" classification code.

Government Debt: Central government debt as a share of GDP. Source: International Monetary Fund *Historical Public Debt Database*. and Jaimovich and Panizza (2010).

Openness: Sum of exports and imports as a share of GDP. Source: World Bank *World Development Indicators*.

Private Credit: Private credit provided by deposit money banks and other financial institutions as a share of GDP. Source: World Bank Financial Structure and Development Dataset (July 2018 version).

Capital Account Openness: An index measuring the degree of capital account openness. Source: Chinn and Ito (2006).

Financial Crisis: A dummy variable that takes the value one if a country is experiencing a banking crisis. Source: Laeven and Valencia (2012).

Inflation: CPI inflation rate, transformed as $\pi/100/(1+\pi\ /100)$. Source: World Bank *World Development Indicators*.

GDP: Real GDP per capita. Source: World Bank *World Development Indicators*.

Growth: annual percentage growth rate of real GDP per capita. Source: World Bank *World Development Indicators*.

Growth Volatility: Three-year rolling standard deviation of Growth.

Exchange Rate Volatility: Annual standard deviation of monthly percentage changes in real effective exchange rates. Source: International Monetary Fund *International Financial Statistics* and Darvas (2012).

Variables, findings, and expected signs

Variable	SDH	L	MS	HW	Expected sign
Bank groups				x*	+
Labor groups				x*	-
Central bank independence	x*	x*	x	x	+
Political polarization		x*		x*	+
Checks and balances		x*	x	x*	+
Democracy		X		x*	+
Central government debt	x*	X		x	-
Openness	x*	x*	x	x*	-
Capital account openness	x			x	+
Private credit	x*	x		x*	-
Financial crisis	x			x	-
Inflation	x*	x*	x*	x*	-
GDP per capita		x*	x	x*	+
Growth	x			x	±
Growth volatility	x*		x*	x*	±

Variable	SDH	L	MS	HW	Expected sign
Exchange rate volatility	x*		x*	x	±
Exchange rate regime (flexibility)	x*	x*	x*	x*	+
Political fractionalization		x*			+
Financial structure	x*				+
Deposit money bank Assets		x			+
Interest rate			x*		+
Fiscal balance	x				+
Public domestic debt		x*			+
Current account			x		-
External debt	x				-
Liquid liabilities		x			+
Number of inflation targeters		x*			+
Federalism		x*			+
Government stability		x			+
Partisanship (rightist)			x		+
Bank regulation by CB (none)			x*		+
Parliamentary democracy			x		+
Government transparency			x		±

The four papers considered are Samarina and de Haan (2014) (SDH), Lucotte (2010) (L), Mukherjeee and Singer (2008) (MS), and this paper (HW). The symbol "x" indicates the variable is included. The symbol "x*" indicates the variable is found to be statistically significant.

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