ORIGINAL PAPER

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The choice of inflation targeting— an empirical investigation

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Abstract A growing number of countries have anchored their monetary policy to an explicit numerical rate or range of inflation since such an inflation targeting framework was first adopted by New Zealand in 1989. This paper empirically investigates economic structure and institutional factors associated with a country's choice of inflation targeting using a dataset of 66 countries for the period of 1980–2000. It is found that a sound fiscal position is significantly and positively associated with the choice of inflation targeting framework; the central bank is more likely to adopt inflation targeting with greater financial depth; institutional capacity including central bank autonomy and flexible exchange rate regime is important for the choice of inflation targeting.

1 Introduction

Economists and policymakers have long sought the holy grail of monetary policy. Since New Zealand first adopted an inflation targeting framework in 1989, a growing number of countries have anchored their monetary policies to an explicit numerical rate or range of inflation. By the end of 2002, there were 22 inflation targeting countries;[1] two countries (Argentina and Turkey) are possibly on their way, and G3 and other emerging economies could join this club in the future.

Inflation targeting has been increasingly viewed as a good monetary policy framework and widely applauded by economists and policymakers. In the literature, the benefits of inflation targeting on inflation and output can be sum-

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[1] The number of inflation targeting countries might vary depending on the definition of inflation targeting. This issue is further discussed in Section 2.

marized in two strands. First, inflation targeting improves the performance of inflation and output. In other words, an inflation targeting framework could lower the level and variability of inflation, increase output growth but decrease its variability, and diminish the persistence of inflation. For example, Neumann and von Hagen (2002) compare statistics for inflation targeters and non-targeters across different periods and find that inflation targeting reduces the volatility of inflation, output, and interest rates. Wu (2004) applies the differences-to-differences estimation to the quarterly inflation rates of the 22 OECD countries (including eight inflation targeters) for the period of 1985–2002 and finds a decrease in the level of inflation rates for the inflation targeting countries. Second, inflation targeting improves inflation forecasting by lowering the level of expected inflation and/or increasing its predictability (Corbo 2001; Johnson 2002; and Mishkin and Schmidt-Hebbel 2001).

On the other hand, an almost equal number of studies claim not to find clear evidence supporting the benefits of inflation targeting, though their results do not provide arguments against it either. For example, Ball and Sheridan (2003) examine changes in the level and variability of inflation and output as well as the persistence of inflation for seven inflation targeters and 13 non-targeters among industrial countries. They conclude that countries on average improved their performance in the 1990s, but there is no significant evidence that inflation targeters performed better than non-targeters. Cecchetti and Ehrmann (1999) argue—based on a study of 23 countries (including nine inflation targeters) over the 1984–1997 period—that inflation aversion increased, but inflation targeting made little difference in the 1990s.

The resulting empirical difference in the inflation targeting literature is partly because of the small number of inflation targeting countries and the short history of this new monetary framework. It will perhaps take more than a decade for inflation targeting to become fully credible and to be fully studied. At this point, empirical investigations of inflation targeting can provide a reasonable evaluation of what has been done and a sensible suggestion about what might happen under an inflation targeting framework.

The choice of inflation targeting of the 22 inflation targeting countries was itself a policy decision of central banks. In making such a decision, policymakers were influenced at least in part by a country's economic structure and institutional capacity. For example, in an economy with relatively high openness or with weak fiscal position, the authorities might be less likely to adopt inflation targeting since the monetary policy is hard to fulfill in those situations. If a country has relatively flexible exchange rate and independent central bank, it might be easier for the authorities to choose inflation targeting. These issues will be empirically tested in the paper. This paper complements the existing literature by investigating factors associated with a country's choice of inflation targeting using a dataset of 66 countries for the 1980–2000 period.

This paper is organized as follows. Section 2 introduces the data and variables and reports on preliminary statistical analysis. Section 3 describes the empirical methodology employed and presents the regression results. The results are encouraging and informative, in spite of the small number of inflation targeting countries and the short history these countries have had to implement the inflation targeting framework. Section 4 concludes.

2 Data and variables

2.1 Data source and sample countries

The sample in this paper covers annual observations for 66 countries for the 1980–2000 period, 22 of which are inflation targeting countries and the remaining 44 of which are non-inflation targeting countries (see the Appendix for the country list).[2] Data is collected on yearly basis for each country during the sample period. Sample periods for a few emerging countries are shorter depending on their data availability. For example, data on Eastern European economies including Bulgaria, the Czech Republic, Hungary, Romania, Slovakia, Slovenia, Ukraine, and Russia are available only after their transition was completed in the 1990s. Most data are collected from International Financial Statistics by IMF and World Development Indicators by World Bank unless specified.

2.2 Dependent variables

Given this paper's focus on inflation targeting, it is important to properly identify the inflation targeting countries and the dates of their adoption of inflation targeting. The literature provides us a variety of lists on these two variables, depending on the researchers' different perspectives and interpretations of the inflation targeting framework. For example, Peru considered adopting inflation targeting in January 1993 as pointed out in Kuttner and Posen (2001), in January 1994 as observed in Mishkin and Schmidt-Hebbel (2001), but it was not regarded as an inflation targeter by the end of 2001 (IMF's *International Financial Statistics 2001*).

Truman (2003) summarizes four principal elements that characterize an inflation targeting country: 1) adopting price stability as the formal goal of monetary policy, 2) articulating a numerical target or sequence of targets, 3) establishing a time horizon to reach the target, and 4) creating an evaluation system to review whether the target has been met. Based on these four elements and after extensive contacts with the relevant central banks, Truman identifies 22 inflation targeting countries. Table 1 lists these countries as well as the dates when they adopted inflation targeting.

Three countries—Chile, Mexico, and Israel—have two initiation dates for adopting inflation targeting because these countries started with a monetary framework of mixed targets at the earlier date then abandoned the mixed targets, and switched to full-fledged inflation targeting.[3] Specifically, Chile announced a mixed framework of inflation targeting and a crawling exchange rate regime in September 1990 then moved to a sole target of inflation in September 1999. Israel implemented

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[2] The selection of the 66 sample countries is based on the list of the 178 IMF member countries, which have data available for most variables between the year of 1980–2000.

[3] Spain actually operated under a de facto mixed regime from January 1995 to December 1998. Spain adopted inflation targeting in January 1995 in the context of an increase in VAT and a concern about the pass-through to inflation. That pass-through was much less than expected, nevertheless the peseta came under downward pressure in March 1995 and was devalued within the widened bands of the exchange rate mechanism of the European Monetary System. In the same formal sense, Finland operated under a de facto mixed regime from January 1995 onward, but it did not experience any conflict situation.

Table 1 The fact sheet of 22 inflation targeting countries

| | | | At the moment of adopting inflation targeting… | | |
| | | | | Exchange rate regime | |
Inflation targeting countries	Date of adopting inflation targeting	Inflation rate	Real GDP growth	De-facto floating	De-jure floating
Australia	June 1993	0.99	2.09	1	1
Brazil	June 1999	3.2	0.79	0	0
Canada	Feb. 1991	4.77	−0.23	1	1
Chile	Early date: Sept. 1990	26.04	3.7	1	0
	Late date: Sept. 1999	3.33	−0.98	1	0
Colombia	Oct. 1999	11.22	−4.2	1	0
Czech Republic	Dec. 1997	8.55	−0.76	1	1
Finland	Feb. 1993 (– Dec. 1998)*	2.6	−3.32	0	0
Hungary	June 2001	9.78	5.19	0	0
Iceland	March 2001	5.16	5.47	0	0
Israel	Early date: Dec. 1991	19.02	6.24	0	0
	Late date: June 1997	11.28	4.51	1	0
Korea	April 1998	4.43	5.01	0	0
Mexico	Early date: Jan. 1995	6.96	4.41	0	0
	Late date: Jan. 2001	9.49	6.64	1	1
New Zealand	Dec. 1989	7.49	0.23	0	1
Norway	March 2001	3.09	2.7	0	0
Peru	Jan. 2002	1.98	0.2	n.a	n.a
Philippines	Jan. 2002	6.12	3.4	n.a	n.a
Poland	Sept. 1998	11.73	4.84	1	0
South Africa	Feb. 2000	5.18	2.12	1	1
Spain	Jan. 1995 (– Dec.1998)*	4.71	2.26	0	0
Sweden	Jan. 1993	2.29	−1.43	0	0
Thailand	May 2000	0.32	4.43	1	1
UK	Oct. 1992	3.73	0.23	1	0

*Finland and Spain gave up inflation targeting regime after they joined Euro area in January 1999

inflation targeting together with a widening exchange rate band in December 1991 then abandoned the exchange rate target in June 1997. Mexico started with a mixed regime of inflation and monetary targeting in January 1995 but completely implemented inflation targeting in January 2001. It took some years for these three countries to move from a mixed regime toward a sole inflation targeting framework. Thus, it is interesting to examine whether the results in the analysis are different when using the alternative dates of adoption for these three countries.

In summary, Table 1 shows 22 inflation targeting countries by 2002, of which nine are industrial countries and 13 are emerging-market economies. New Zealand was the first country to adopt inflation targeting as its monetary framework in December 1989. Following New Zealand, six industrial countries became inflation targeters in the early 1990s. Finland and Spain gave up inflation targeting after they joined the European Monetary Union in January 1999, thus they were not ac-

counted as inflation targeting countries ever since. Most emerging-market economies have a fairly short history of full implementation of inflation targeting since the late 1990s.

The dummy variable for inflation targeting takes the value 1 in the year in which these regimes are adopted, and the value 0 otherwise. This paper follows the "half-year-rule" to decide the policy regime of the year, if the data are monthly. When a regime is adopted in the first half of a year, that year is taken as the year of adoption; when a regime is adopted in the second half of a year, the year after is taken as the adoption year.

2.3 Economic structure and institutional variables

We are particularly interested in whether the choice of inflation targeting is associated with a few economic structure and institutional factors and discuss these factors in detail below.

Economic structure variables Four variables are chosen to describe a country's structure characteristics—fiscal position, trade openness, external indebtedness and financial depth.

Fiscal position is measured as its surplus (+)/deficit (−) percent of nominal GDP, thus the variable is positive if in surplus and negative if in deficit. A strong fiscal position is expected to be advantageous for adopting the inflation targeting framework. If a country is not fiscally sound, it is very likely that the government might pressure the central bank to finance a large deficit by encouraging expansionary monetary policy, which can lead to a failure to meet the targeted inflation.

Trade openness is proxied by the ratio of exports plus imports of goods and services to nominal GDP. It might be the case that it becomes more difficult for the authority to have an effective monetary policy with a higher degree of openness. On the other hand, however, a stable monetary policy is still feasible, if the monetary authority takes into account the open environment. Therefore we are uncertain about the sign of this variable.

External indebtedness is measured as the ratio of each country's external debt position to GDP. The data for developing countries are drawn from the database of *World Development Indicators*; the data for industrial countries are constructed from the sum of stocks of portfolio investment debt securities and other investment liabilities under the international investment position accounts in the IMF's *International Financial Statistics*. However, four countries (Greece, Ireland, Singapore, and Saudi Arabia) do not have international investment position data. Lane and Milesi-Ferretti (1999) provide a method to estimate the external debt for countries where stock data are not available. Following Lane and Milesi-Ferretti, the external debt positions of these four countries are estimated by accumulating flows of portfolio investment debt securities and other investment liabilities under their balance of payment accounts in the IMF's *International Financial Statistics*, assuming their initial values of external debt are negligible.[4]

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[4] Flows of portfolio investment debt securities and other investment liabilities are accumulated for these four countries since the year when their data are first available. Specifically, 1976 is the initial year for Greece, 1974 for Ireland, 1976 for Singapore, and 1971 for Saudi Arabia.

External indebtedness proxies a country's financial openness. The more open a country is, the harder it is for the central bank to implement monetary policy effectively, and thus external debt contributes negatively to the choice of inflation targeting.

Financial depth is proxied by the ratio of M2 to nominal GDP, which represents the degree to which the economy is monetarized.[5] Accordingly, the larger the ratio, the greater the capacity monetary authorities have to implement monetary policy effectively.

Economic institutional variables Two institution indicators are most relevant to this inflation targeting study: whether the central bank has autonomy and whether a country has a floating exchange rate regime.

Central bank autonomy is thought to be associated with the capacity to implement anti-inflation policies.[6] In other words, the central bank should have the institutional capacity to implement its monetary policy with little outside intervention, which requires a substantial degree of autonomy if not full independence. Many indicators can be issued to measure central bank autonomy, but the multifaceted measures could cause severe problems of interpretation.[7] Thus we follow Kuttner and Posen (2001) to narrow down the focus to two aspects of the legal structure: 1) whether there are barriers to firing the central bank governor, and 2) whether the central bank is prevented from purchasing government debt directly. The central bank is identified as in full autonomy if answers to both questions are yes and in partial autonomy if there is only one positive answer.[8] This variable is established using data provided in Cukierman (1992), Cukierman et al. (2001), Kuttner and Posen (2001) and an examination of other information on the mandates of central banks.[9]

Two standards are often used in classifying exchange rate regimes in the literature. A de jure classification is based on the country's publicly stated policy as summarized in the IMF's *Annual Report on Exchange Arrangements and Exchange*

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[5] Willamson and Mahar (1998) suggest that financial depth, measured by M2/GDP, is a helpful indicator to determine a financial system's efficiency in mobilizing funds to foster economic growth.

[6] Note that the variable for central bank "autonomy" is used, not a variable for central bank "independence," either instrument or goal independence. See the debate on the role of these two variables in the choice of a monetary framework in Mishkin and Schmidt-Hebbel (2001).

[7] There are a large number of indicators to measure central bank autonomy or independence. However, the reliability and usefulness of these indicators have been questioned, since the existing indicators differ substantially from each other, in terms of the criteria contained in the index, the interpretation and evaluation to these criteria, and the way in which the criteria are aggregated. Thus the choice of indicators could lead to very different results. (Berger et al. 2001; Posen 1998; and Cukierman 1992). However, it does not mean these indicators are uninformative; it implies that the application of indicators is needed to be supplemented by judgment. Cukierman (1992) argues that some indices are more proper for some purpose than for others. For example, the turnover rate for governors or members of the policy board is a good indicator for central bank autonomy.

[8] This paper focuses on the effects of central bank autonomy on the choice of inflation targeting rather than whether the degree of autonomy causes differences in the results. Accordingly, the value 1 is assigned to the dummy for central bank autonomy if the central bank is in full autonomy, and 0 otherwise.

[9] For countries without previously codified central bank autonomy data, Truman used these sources such as mandates to make a judgment, applying his intuition and expertise.

Restrictions. A de facto classification is normally based on the observed behavior of exchange rates. Either classification has its advantages and disadvantages. The de jure classification captures central banks' formal commitment but fails to control for any actual policy inconsistency; while the de facto classification documents the actual movement of exchange rates but misses the structure features.

In practice, data of both de facto and de jure exchange rate regimes are employed in the regression analysis in order to examine whether these two classifications are associated with differences in the results. Data on the de jure exchange rate regime are collected from the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*. Exchange rate regimes from nine categories found in the IMF's report are then reclassified into three categories: a floating exchange rate regime includes free floating and managed floating; an intermediate floating exchange rate regime includes basket pegging, crawling pegging, and band arrangements (ERM); and a fixed exchange rate regime includes hard pegging and a currency board.[10]

In terms of the de facto exchange rate regime, the classification by Levy-Yeyati and Sturzenegger (2002) is applied. Levy-Yeyati and Sturzenegger categorize exchange rate regimes based on changes in a country's nominal exchange rate, the volatility of these changes, and the volatility of international reserves. Their three-way classification divides observations into floating, intermediate floating, and fixed regimes, which are consistent with this paper's de jure classification.

Comparing the de jure and de facto exchange rate regimes, it seems that developed countries often announce their flexible exchange rate regimes and are identified as such in de facto classification. Emerging-market economies tend to have different de jure and de facto exchange rate regimes, particularly in the face of pressure. As a whole, the two classifications are quite different with a low correlation of 0.38.[11]

A need for flexibility is expected when adopting inflation targeting, though not necessarily all the way to a free-floating exchange rate regime.[12] A country's exchange rate target should be subordinated to its inflation target because inflation targeting is incompatible with a rigid exchange rate regime.

Empirically, these two institutional variables—full central bank autonomy and floating exchange rate regime—take the value 1 in the year in which these regimes are adopted, and the value 0 otherwise. They also follow the "half-year-rule" to decide the policy regime if the data are monthly. In other words, when a regime is adopted in the first half of a year, that year is taken as the year of adoption; when a regime is adopted in the second half of a year, the year after is taken as the adoption year.

2.4 Control variables

Two variables—real GDP growth and inflation rate—are applied to control a country's macro characteristics. Real GDP growth is measured as the chain percentage change of real GDP and inflation rate is proxied by the change in consumer

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[10] Applying the similar reason used for the variable for central bank autonomy, the value 1 is assigned to the dummy for floating exchange rate regime if it is free or managed floating, and 0 otherwise.
[11] See Reinhart and Rogoff (2002) for a similar discussion.
[12] See a similar argument in Amato and Gerlach (2002).

price index (CPI) and used to control a country's inflation level. To alleviate the potential endogeneity of inflation rate, we use the one-year lagged inflation rate in the regressions.[13]

3 Empirical methodology and regression results

3.1 Empirical methodology

To examine the factors associated with a country's inflation target choice, we apply the following logit model specification

$$Y_{it} = \alpha_0 + \alpha_1 ES_{it} + \alpha_2 EI_{it} + \alpha_3 ControlVar_{it} + Year + \varepsilon_{it} \tag{1}$$

where i and t denote country and year specifically. Y is the dummy variable for the choice of inflation targeting. In terms of three inflation targeting countries (Chile, Mexico and Israel) having two dates for inflation targeting adoption, we used their early and late dates alternately in the regressions. ES includes a vector of variables for economic structure including fiscal position, trade openness, external indebtedness and financial depth. EI represents a vector of variables for institutional capacity including central bank autonomy and floating exchange rate system. Control variables include real GDP growth and the lagged inflation rate. Year denotes year dummies to capture the macroeconomic effects over years.

Taking into consideration of the relatively small percent of the observations with IT dummy equal to 1 in our sample, we tried to run cross-country regressions as a robustness check for the results under the panel logit regressions. Specifically, we assigned each country two observations. For the non-inflation targeting countries, one observation is its mean between year 1980–1989, and the other is its mean between year 1990–2000. For the inflation targeting countries, one observation is its mean between 1980 and the year before adopting inflation targeting, and the other is its mean between the year adopting inflation targeting and Year 2000. IT dummy still takes either 1 or 0: it equals to 1 for the mean observations estimated between the year of adopting inflation targeting and Year 2000, 0 otherwise. Two institutional variables—central bank autonomy and flexible exchange rate regime—take the value between 0 and 1. If the values are close to 1, it suggests high central bank autonomy and more flexible exchange rate arrangements, and vise versa.

We estimated Eq. (1) by using robust regression method,[14] which down-weighs the sample outliers to make the estimation less sensitive to measurement errors. We also applied White-corrected standard errors to deal with potential problem of heteroskedasticity.

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[13] The level of inflation could affect a country's choice of inflation targeting; on the other hand, however, the adoption of inflation targeting regime could also affect its inflation rate. See, for example, Neumann and von Hagen (2002) and Wu (2004), for detailed analysis on the impact of inflation targeting regime on inflation rate. Thus we used the one-year lagged inflation rate as the control variable.

[14] See, for example, Huber (1964) for the reference.

Table 2 Logit estimation on the choice of inflation targeting

Dependent variable: inflation targeting dummy

	Using early dates of inflation targeting		Using late dates of inflation targeting	
	(1)	(2)	(3)	(4)
Structure factors				
Fiscal position	0.063*	0.057*	0.034	0.028
	(0.037)	(0.038)	(0.036)	(0.035)
Trade openness	0.005*	0.004	0.003	0.002
	(0.003)	(0.003)	(0.003)	(0.004)
External indebtedness	0.001	−0.003	0.002	−0.000
	(0.003)	(0.003)	(0.004)	(0.004)
Financial depth	0.005**	0.007***	0.004*	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Institutional factors				
Central bank autonomy	0.889***	0.908***	0.102	−0.004
	(0.272)	(0.288)	(0.305)	(0.333)
de facto floating EX	1.404***		1.444***	
	(0.280)		(0.334)	
De jure floating EX		0.674***		1.270***
		(0.261)		(0.360)
Control variables				
Real GDP growth	0.018	0.011	−0.031	−0.036
	(0.014)	(0.013)	(0.042)	(0.038)
One-year lagged inflation rate	−0.065***	−0.052**	−0.284***	−0.270***
	(0.023)	(0.021)	(0.051)	(0.052)
Constant	−3.227***	−2.846***	−2.092***	−2.126***
	(0.431)	(0.382)	(0.484)	(0.451)
Observations	1069	1070	1069	1070
Adjusted R-squared	0.15	0.12	0.26	0.25

1) ***, ** and * denote 1, 5 and 10% significant levels, respectively
2) The numbers in the brackets are white-corrected standard errors

3.2 Regression results

The regression results based on Eq. (1) are presented in this section.[15] As shown in Table 2, models (1) and (2) use the early dates of adopting inflation targeting for the three countries including Chile, Mexico while Israel and models (3) and (4) use their late dates of adoption.

Four factors stand out. First, the variable for fiscal position is significantly and positively associated with inflation targeting in models (1) and (2),[16] while the coefficients are positive but insignificant in models (3) and (4). Thus it weakly

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[15] To save space, we do not report the estimated coefficients of year dummies.
[16] This result is consistent with the finding by Mishkin and Schmidt-Hebbel (2001) based on a much smaller sample of countries.

supports our prior that a strong fiscal position increases the probability of adopting inflation targeting.

Second, financial depth is significantly and positively associated with the choice of inflation targeting in all models, which implies the degree of monetarization has a positive impact on monetary authorities' decision on adoption of inflation targeting.

Third, the central bank should have the institutional capacity to implement its monetary policy with little outside intervention, which requires a substantial degree of autonomy if not full independence. The central bank variable autonomy is found to be significantly positive in models (1) and (2).

Fourth, a flexible exchange rate regime was expected to be advantageous for adopting inflation targeting, though not necessarily all the way to a free-floating

Table 3 Robustness check – excluding high inflation countries

Dependent variable: inflation targeting dummy				
	Using early dates of inflation targeting sub-sample (excluding Obs. with inflation rate above 50%)		Using late dates of inflation targeting sub-sample (excluding Obs. with inflation rate above 50%)	
	(1)	(2)	(3)	(4)
Structure factors				
Fiscal position	0.062*	0.057*	0.034	0.028
	(0.037)	(0.038)	(0.036)	(0.035)
Trade openness	0.005*	0.004	0.003	0.002
	(0.003)	(0.003)	(0.003)	(0.004)
External indebtedness	0.001	−0.003	0.002	0.000
	(0.003)	(0.003)	(0.004)	(0.004)
Financial depth	0.005*	0.006***	0.004*	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Institutional factors				
Central bank autonomy	0.890***	0.912***	0.096	−0.022
	(0.273)	(0.289)	(0.305)	(0.336)
De facto floating EX	1.402***		1.442***	
	(0.281)		(0.333)	
De jure floating EX		0.689***		1.298***
		(0.261)		(0.368)
Control variables				
Real GDP growth	0.017	0.009	−0.035	−0.044
	(0.014)	(0.014)	(0.043)	(0.040)
One-year lagged inflation rate	−0.062**	−0.048**	−0.284***	−0.272***
	(0.025)	(0.023)	(0.051)	(0.053)
Constant	−3.245***	−2.885***	−2.074***	−2.103***
	(0.438)	(0.394)	(0.488)	(0.453)
Observations	959	960	959	960
Adjusted R-squared	0.17	0.13	0.24	0.23

1) ***, ** and * denote 1, 5 and 10% significant levels, respectively
2) The numbers in the brackets are white-corrected standard errors

exchange rate regime. A country's exchange rate target should be subordinated to its inflation target because inflation targeting is incompatible with a rigid exchange rate regime. Both the de facto and de jure floating exchange rate regimes are used in the regressions and found to be significantly and positively associated with inflation targeting dummy in all models.

In terms of the control variables, it is shown that the one-year lagged inflation rate is significantly negative in all regressions, which probably suggests monetary authorities generally choose inflation targeting to maintain their already low inflation rates or to converge to a lower rate, rather than to squeeze very high inflation rates down. Truman (2003) identifies these three types of inflation targeting countries as

Table 4 Robustness check – using shorter sample period

Dependent variable: inflation targeting dummy

	Using early dates of inflation targeting sub-sample (Year: 1985–2000)		Using late dates of inflation targeting sub-sample (Year: 1985–2000)	
	(1)	(2)	(3)	(4)
Structure factors				
Fiscal position	0.043*	0.037*	0.024	0.016
	(0.037)	(0.03)	(0.036)	(0.035)
Trade openness	0.006*	0.004	0.004	0.003
	(0.003)	(0.003)	(0.003)	(0.004)
External indebtedness	−0.001	−0.005	0.001	−0.002
	(0.003)	(0.003)	(0.004)	(0.004)
Financial depth	0.005**	0.007***	0.004*	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Institutional factors				
Central bank autonomy	0.901***	0.945***	0.121	0.051
	(0.271)	(0.275)	(0.309)	(0.338)
De facto floating EX	1.381***		1.422***	
	(0.277)		(0.329)	
De jure floating EX		0.674***		1.275***
		(0.250)		(0.353)
Control variables				
Real GDP growth	0.010	0.003	−0.042	−0.048
	(0.017)	(0.015)	(0.044)	(0.038)
One-year lagged inflation rate	−0.057***	−0.044**	−0.257***	−0.246***
	(0.020)	(0.017)	(0.050)	(0.053)
Constant	−3.016***	−2.682***	−1.988***	−2.067***
	(0.415)	(0.372)	(0.485)	(0.460)
Observations	874	874	874	874
Adjusted R-squared	0.21	0.25	0.24	0.23

1) ***, ** and * denote 1%, 5% and 10% significant level respectively
2) The numbers in the brackets are white-corrected standard errors

Table 5 Robustness check – cross-country regressions

Dependent variable: inflation targeting dummy

	Using early dates of inflation targeting		Using late dates of inflation targeting	
	(1)	(2)	(3)	(4)
Structure factors				
Fiscal position	0.013**	0.011*	0.012*	0.010*
	(0.007)	(0.006)	(0.006)	(0.006)
Trade openness	0.0002	0.0001	0.0002	0.0001
	(0.001)	(0.001)	(0.001)	(0.001)
External indebtedness	−0.0002	−0.001	−0.0003	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Financial depth	−0.0003	0.0001	0.0003	0.0004
	(0.001)	(0.001)	(0.001)	(0.001)
Institutional factors				
Central bank autonomy	0.0001	0.012	0.012	0.023
	(0.099)	(0.115)	(0.100)	(0.115)
De facto floating EX	0.305***		0.269***	
	(0.094)		(0.092)	
De jure floating EX		0.145*		0.117*
		(0.077)		(0.074)
Control variables				
Real GDP growth	0.003	0.004	0.002	0.003
	(0.008)	(0.006)	(0.007)	(0.005)
One-year lagged inflation rate	−0.003**	−0.003**	−0.003**	−0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.134	0.186**	0.117	0.164*
	(0.085)	(0.091)	(0.083)	(0.088)
Observations	117	117	117	117
Adjusted R-squared	0.23	0.12	0.20	0.11

1) ***, ** and * denote 1, 5 and 10% significant levels, respectively
2) The numbers in the brackets are white-corrected standard errors

"maintainers", "convergers", and "squeezers", respectively.[17] As presented in the third column in Table 1, 19 out of 22 inflation targeting countries are either "maintainers" or "convergers" at the time of full–fledged inflation targeting. Even the inflation rates of the remaining three "squeezers" (Colombia, Israel, and Poland) were very close to 10% at the time of adoption. The rationale for adopting inflation targeting at a low inflation rate comes, perhaps, from a concern about central bank credibility. In fear of losing public credibility, the central banks might be inclined to adopt inflation targeting only when inflation rates are low, which makes their targeted inflation easier to reach or maintain.

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[17] According to Truman's (2003) classification, maintainers' inflation rates are less than 5% but above zero, convergers' inflation rates are more than 5% but less than 10%, and squeezers' inflation rates are 10% or higher.

Tables 3, 4, 5 check the robustness of those findings presented in Table 2. Concerning the volatility in data brought by those extremely high inflation countries, we test the robustness of the coefficients by eliminating observations in the year with inflation rates of more than 50% (Table 3). As shown in Table 3, we found the regression results are similar to those presented in Table 2.

No country adopted inflation targeting in the early and mid-1980s. It is reasonable to question whether the regression results are different when a shorter period of 1985–2000 is used. These experiments suggested that the results remained unaffected (Table 4).

We finally ran the cross-country regressions as a further robustness check for the panel regression results. As presented in Table 5, we found that a sound fiscal position and a flexible exchange rate regime are significantly and positively associated with the choice of inflation targeting, which is consistent with our findings based on the panel regressions.

4 Conclusion

This paper studies whether economic structure and institutional factors might be associated with a country's choice of inflation targeting as its monetary framework. The empirical investigation finds a number of factors associated with the choice of inflation targeting.

First, a sound fiscal position benefits the authority when adopting the inflation targeting framework. The regression results support the prior that the variable of fiscal position is significantly and positively associated with the choice of inflation targeting is significantly positive. Second, a high degree of monetarization provides monetary authorities with great capacity to implement their policy effectively, thus central bank is more likely to adopt inflation targeting regime in a deep monetized economy. Third, institutional capacity measured by central bank autonomy is important for the choice of inflation targeting. Fourth, a country's exchange rate target should be subordinated to its inflation target because inflation targeting is incompatible with a rigid exchange rate regime. Flexible exchange rate regime is found to be an important condition for adopting inflation targeting.

Looking at the experience of inflation targeters and other countries, a number of economic structure characteristics and the institutional capacity of the monetary authority are found to increase the probability of adopting inflation targeting, although these factors should not be interpreted as the preconditions for inflation targeting. For example, when adopting inflation targeting, a country's fiscal position should not be one of fiscal dominance in which the central bank is obligated to finance the government; flexible exchange rate is advantageous though not necessarily all the way to a free-floating exchange rate regime; the monetary authority should have reasonable institutional capacity if not full independence. In sum, inflation targeting may not be optimal for all countries because economic structure and institution may not be conducive or the monetary

authority may not have the political power to implement such a framework.[18] However, the increased transparency, better macroeconomic discipline and enhanced risk management practice normally associated with the inflation targeting regime can benefit the performance of the global economy and the international financial system.

Appendix

List of sample countries (66 countries)

Inflation targeters (22 countries)	Non-inflation targeters (44 countries)
Australia	Argentina
Brazil	Austria
Canada	Bangladesh
Chile	Belgium
Colombia	Bolivia
Czech Republic	Bulgaria
Finland	China
Hungary	Costa Rica
Iceland	Denmark
Israel	Dominican Republic
Korea	Ecuador
Mexico	Egypt
New Zealand	France
Norway	Germany
Peru	Greece
Philippines	Guatemala
Poland	Honduras
South Africa	India
Spain	Indonesia
Sweden	Ireland
Thailand	Italy
United Kingdom	Japan
	Malaysia
	Morocco
	Netherlands
	Nigeria

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[18] As analyzed in Chapter 4 in Truman (2003), adopting inflation targeting by G3 (the US, Euro-Area and Japan) would be a "net plus for the world economy". "G3 should adopt inflation targeting, preferably collectively, or, as a second best, individually to improve their economic performance and to reduce the risk of deflation. The IMF should actively encourage the G3 to do so because of the benefits to the performance of the global economy and the international financial system." (pp. 215, Truman 2003).

Inflation targeters (22 countries)	Non-inflation targeters (44 countries)
	Pakistan
	Panama
	Paraguay
	Portugal
	Romania
	Russia
	Saudi Arabia
	Singapore
	Slovak Republic
	Slovenia
	Sri Lanka
	Switzerland
	Turkey
	Ukraine
	United States
	Uruguay
	Venezuela
	Vietnam

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