Developing Economies Benefit the Most From Inflation Targeting for Attracting FDI

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This study investigates if developing nations implementing the inflation targeting monetary policy are more successful in attracting FDI cash flows relative to both developed nations practicing inflation targeting, as well as nations utilizing alternative monetary policies. Subsequently, we investigate based on regional-cultural clusters where inflation targeting is most successful for attracting FDI. Our results provide two primary contributions to the inflation targeting literature: (i) inflation targeting has a positive impact on attracting FDI for Lower-Middle Income nations, but not for Upper-Middle Income or High Income nations; (ii) inflation targeting is most successful in regional-cultural clusters with a larger representation of Middle Income nations rather than High Income Nations.

Keywords: inflation targeting, monetary policy, development economics, FDI

INTRODUCTION

As the global economy has truly developed over the past century or two, perhaps the most important international trade discussion regards the approach to managing exchange rates. Historically, this monetary policy debate consists of two extremes. First, a fixed exchange rate, where a nation sets a specific exchange rate between its currency and one of the dominant currencies around the world (e.g., US Dollar, Japanese Yen). Defense of a fixed exchange rate surrounds economic stability, increased international trade, and a barricade to speculative attacks (Nurkse, 1944). On the other end, we have a floating exchange rate, where a currency is allowed to fluctuate without restriction based on the supply and demand from the domestic and global marketplace. Arguments for a floating exchange rate are increased control for the central bank regarding all monetary policy decisions, the ability to hedge against speculative attacks through forward contracts, and important economic indicators, such as price levels, unemployment, and exchange rates, are free to balance out naturally and efficiently (Friedman, 1953).

Although there is no universal solution to determining the appropriate choice of managing an exchange rate, most nations find themselves somewhere in between the two extremes. Calvo and Mishkin (2003) suggest most nations select an exchange rate that is often partially stabilized by a central bank, but also allowed to shift naturally from various economic changes, commonly known as a "soft peg". However, the intermediate methods present another issue, what is publicly stated versus what is actually applied. Hoffmann (2007) explains that these combination strategies complicate monetary policy decisions even more than the extremes due to the uncertainty of a government's goals and actions while managing an

exchange rate. Complete transparency of all monetary authority goals and decisions is critical in building domestic support for a nation's monetary policy authorities, but also pertinent for confidence and growth in the international marketplace (Jonas and Mishkin, 2004; Kinoshita and Campos 2003; Mishkin, 1998).

The monetary policy framework of inflation targeting evolved from this un-answerable debate. Inflation targeting is considered a form of a floating exchange rate because it typically has no set ties to any other currency. Inflation stability serves as the primary objective and determining factor for all monetary policy actions. Within this framework inflation is given a target range, which allows for government flexibility regarding various economic tools to a certain extent. For example, the 2013 target range for the developed high income economy of Chile was 2% to 4%, the upper middle income economy of Turkey was 3% to 7%, while lower middle income Ghana was 6% to 10% (Hammond 2012). Although inflation targeting is one of many intermediate strategies, its framework addresses the majority of crucial topics debated historically regarding exchange rate determination (Fraga et al., 2004; Green, 1996; Nessen and Vestin, 2005; Svensson, 1997; Walsh, 2002). This flexibility shifts the focus away from monetary policy choice to the more important aspect of implementation and monitoring of a chosen policy (Green 1996).

LITERATURE REVIEW

Inflation targeting was first put into practice in the early 1990s. A group of high income developed nations, such as Canada, New Zealand, and Sweden, first implemented inflation targeting as their official monetary policy. Currently, there are 32 nations using inflation targeting (see Table 1). The late 1990s through the early 2000s saw a wave of upper middle income nations start to take on the practice, while the most recent decade lower middle income nations have also joined the trend. To date, 12 developed and 20 developing nations have adopted the inflation targeting regime. Regardless of economic classification, the young monetary policy has served well for most participating nations in controlling inflation and increasing international trade (Fraga, Goldfajn, and Minella, 2004; Mason and Vracheva, 2017). Each nation's inflation targeting adoption year is provided in Table 1 (Hammond, 2012)[1, 2].

The IMF recently defined Inflation Targeting in their Annual Report on Exchange Arrangements and Exchange Restrictions. "Inflation Targeting involves the public announcement of numerical targets for inflation, with an institutional commitment by the monetary authority to achieve these targets, typically over a medium-term horizon. Additional key features normally include increased communication with the public and the markets about the plans and objectives of monetary policymakers and increased accountability of the central bank for achieving its inflation objectives. Monetary policy decisions are often guided by the deviation of forecasts of future inflation from the announced inflation target, with the inflation forecast acting (implicitly or explicitly) as the intermediate target of monetary policy." (International Monetary Fund, 2019, p. 5). Jonas and Mishkin (2004) directly support the medium-term horizon as a best practice, which allows for the inevitability of missed targets. They state that if a central bank has complete transparency, inflation target misses should not be detrimental to the economy, or lead to an abandonment of the inflation targeting policy.

Roger (2010) provides a definition with four important aspects. "(1) an explicit central bank mandate to pursue price stability as the primary objective of monetary policy and high degree of operational autonomy, (2) explicit quantitative public targets used for inflation, (3) central bank accountability for performance in achieving the inflation objective, mainly through high transparency requirements for policy strategy and implementation, and (4) a policy approach based on a forward looking assessment of inflation pressures, taking into account a wide array of information" (Roger, 2010, p. 46). Mishkin (2004) and Svensson (1999) developed similar guidelines in the earlier years of policy analysis.

Roger (2010) continues that all nations take on aspects of the inflation targeting monetary policy, however, there is a distinct difference between targeting inflation as one of many tools used by monetary authorities versus full adoption of inflation targeting as a monetary policy. Influential global leaders such as the U.S. Federal Reserve and the European Central Bank monitor and manage their inflation on a regular basis, but do not consider themselves to be, nor do they follow the strict rules of an inflation targeting nation (Cespedes, Chang, and Valasco, 2014, Hammond, 2012).

TABLE 1
INFLATION TARGETING NATIONS

This table provides a list of nations that have adopted the inflation targeting monetary policy. Year IT Started is the year that the nation officially adopted inflation targeting according to Hammond (2012). Economic Class is according to the World Bank databank, which provides four levels of income, high income, upper middle income, lower middle income, and low income.

Nation	Year IT Started	World Bank Economic Class	Nation	Year IT Started	World Bank Economic Class
New Zealand	1990	High income	Mexico	2001	Upper middle income
Canada	1991	High income	Norway	2001	High income
United Kingdom	1992	High income	Peru	2002	Upper middle income
Australia	1993	High income	Philippines	2002	Lower middle income
Sweden	1995	High income	Guatemala	2005	Lower middle income
Israel	1997	High income	Indonesia	2005	Lower middle income
Czech Republic	1998	High income	Romania	2005	Upper middle income
Poland	1998	High income	Armenia	2006	Lower middle income
Republic of Korea	1998	High income	Turkey	2006	Upper middle income
Brazil	1999	Upper middle income	Ghana	2007	Lower middle income
Chile	1999	High income	Georgia	2009	Upper middle income
Colombia	1999	Upper middle income	Serbia	2009	Upper middle income
South Africa	2000	Upper middle income	Russia	2014	Upper middle income
Thailand	2000	Upper middle income	Kazakhstan	2015	Upper middle income
Hungary	2001	Upper middle income	Argentina	2016	Upper middle income
Iceland	2001	High income	India	2016	Lower middle income

The early wave of inflation targeting literature was theoretically driven. Scholars worked through the development stage at the country level discussing how to define inflation targeting as a legitimate monetary policy, when and why it should be implemented, how best to manage it year by year, and what the economic goals and outcomes should be (Calvo and Mishkin, 2003; Goncalves and Carvalho, 2009; Green, 1996; Jonas and Mishkin, 2004; Svensson, 1997, 1999; Walsh, 2002). It took time to reach the point of available sample sizes to justify more statistical based regression analysis. Past studies have found that inflation targeting has been successful in controlling inflation, as well as improvements of other economic indicators, both for developed and developing nations (Fraga et. al., 2004, Mason and Vracheva, 2017; Roger, 2010). Each suggest that there is also a shortage of comprehensive analysis on a global scale. The majority of inflation targeting literature still focuses on more isolated studies, commonly looking at a few, or even just one nation at a time.

Most commonly, larger empirical literature focuses on inflation targeting's impact on controlling inflation, both its value and volatility (Broto, 2011; Ginindza and Maasoumi, 2013; Goncalves and Salles, 2008; Lin and Ye, 2007, 2009; Neuman and von Hagen, 2002; Vega and Winkelried, 2005). Additionally, regression analysis has surrounded inflation targeting's influence on GDP (Abo-Zaid and Tuzemen, 2012; Ball and Sheridan, 2004; Goncalves and Salles, 2008; Mollick, Cabral, and Carneiro, 2011; Siregar and Goo, 2010), interest rates (Neumann and von Hagen, 2002), exchange rate pass through (Aleem and Lahiani, 2014; Prasertnukul, Kim, and Kakinaka, 2010; Siregar and Goo, 2010), and exchange rate volatility (Pontines, 2011; Prasertnukul et al., 2010).

In addition to these common macroeconomic indicators, foreign direct investment (FDI) has started to demand more attention in relation to inflation targeting. Mason and Vracheva (2017) found that inflation targeting nations saw a statistically significant shift away from importing and exporting to increased FDI following a nation's choice to adopt the inflation targeting policy. Although the results showed significance

for developed and developing nations, the results were inconclusive as to what income level is more appropriate for a nation to adopt inflation targeting. The primary issue here is their data only ranged through 2012, thus, the number of observations for the sample of developing nations was rather small. Most of the inflation targeting nations classified as upper middle income and lower middle income (according to the World Bank economic classifications) started the monetary policy at least a decade after the first high income nations started the trend. Kinoshita and Campos (2003) found that in transition economies (primarily middle income nations) effective monetary institutions play a crucial mediating role in attracting international business, especially FDI.

Our study looks to take on a similar form by evaluating the relatively new inflation targeting framework. We look to empirically test, by means of a GLS Random Effects regression, the impact of inflation targeting on national FDI for high income, upper middle income, and lower middle income nations. We are extending the literature by providing the largest comprehensive empirical regression analysis, to the best of our knowledge, on the monetary policy's influence towards FDI. We consider past literature regarding FDI entry, inflation targeting practices, and inflation's impact on international business in order to empirically test whether adopting nations attract higher levels of FDI than non-inflation targeting nations. In addition, we investigate whether the benefits are stronger for developed or developing nations. The results show that inflation targeting is significant in attracting FDI cash flows for the least developed nations of our sample. These findings are useful on the economy and firm levels for inflation targeting nations, trade partners of inflation targeters, and potential adopting nations of inflation targeting.

The remainder of this paper is structured as follows. Next is the theoretical and empirical review of inflation targeting and FDI, which helps develop our hypotheses. The subsequent sections discuss our empirical research methodology and results. In the concluding portion of the paper, we discuss the potential implications of the research, as well as the limitations and future research possibilities.

THEORETICAL DEVELOPMENT

Inflation Targeting & Economic Indicators

Although there are mixed results at times throughout the literature, the majority of inflation targeting research supports the result that the young monetary policy is successful in helping central banks both decrease their levels of inflation, as well as experiencing a decline of inflation volatility. Ginindza and Maasoumi (2013) found that adopting nations were able to significantly stabilize their inflation levels, they used a study of 12 inflation targeting nations versus 18 control nations. A study by Broto (2011) found that South American countries (5 inflation targeting, 3 control) using inflation targeting experienced significant declines in their inflation, inflation volatility, and inflation uncertainty. Lin and Ye (2009) found the inflation targeting policy to be significant in lowering both inflation and inflation volatility for a group of 13 developing nations, versus 39 non-inflation targeting control nations. Adopting nations helped decrease inflation by an average of nearly 3% annually. In a similar study of seven developed inflation targeting nations against 15 control nations, Lin and Ye (2007) did not find significance for lowering inflation or inflation variability. Analyzing a sample of 25 nations (14 inflation targeting, 11 control), Capistran and Ramos-Francia (2010) found inflation targeting reduces the dispersion of long run inflation expectations; however, the full effect is not felt until the third year following adoption.

Even though inflation targeting's primary purpose is to stabilize inflation, it also needs to improve a variety of macro-economic measures to justify its value. Neumann and von Hagen (2002) look at the influence of the monetary policy regarding the volatility of inflation, economic output, and interest rates for a group of developed nations (6 inflation targeting, 3 control) and find results supporting inflation targeting. However, Ball and Sheridan (2004) would later provide a similar analysis of developed nations (7 inflation targeting, 13 control) and do not find significance for inflation targeting improving these same economic indicators. Goncalves and Salles (2008) focus strictly on developing nations (13 inflation targeting, 23 control) and found inflation targeting nations experienced a decline in their inflation, as well as lower GDP growth volatility. Siregar and Goo (2010) found the adopting nations of Indonesia and Thailand significantly increased GDP growth rates while finding declines in their GDP volatility. Mollick

et al. (2011) found inflation targeting led to higher output income per capita for developed and developing nations, however the long run effect is lower for developing nations than for developed. In one of the largest empirical studies to date Abo-Zaid and Tuzemen (2012) using a sample of 50 countries (23 inflation targeting, 27 control) find developing nation inflation targeters have higher and more stable GDP growth, along with lower and more stable inflation. The same study found that developed inflation targeting nations also experienced higher GDP growth and conduct more disciplined fiscal policy after adopting. Aleem and Lahiani (2014) looked at developing nation inflation targeters from East Asia and Latin America and found inflation targeting to be associated with a more credible monetary policy. In sum, the authors suggest that non-inflation targeting nations would benefit from adopting the policy.

Prasertnukul et al. (2010) define the exchange rate pass-through as an indicator of how changes in nominal exchange rates affect domestic prices. Their study of East-Asian inflation targeters (Indonesia, Philippines, Republic of Korea, and Thailand) found inflation targeting helps stabilize inflation through reducing exchange rate pass-through and reduced exchange rate volatility. Siregar and Goo (2010) and Aleem and Lahiani (2014) each found significance in reducing the exchange rate pass-through effect. Pontines (2011) used 23 inflation targeting nations and 51 control nations to find that exchange rate volatility is lower for inflation targeters, and the relationship is stronger for developing nations. To date, inflation targeting research has stayed primarily within the national level economic indicators, and finds significant positive results much more frequently than negative results.

Inflation Control & FDI

Kinoshita and Campos (2003) explain that price stability is considered the primary indicator of a legitimate and stable macroeconomic environment. They continue that showing a history of low inflation and a balanced fiscal budget signals to potential international investors how committed and credible the government is. High and/or volatile inflation suggest macroeconomic instability while distorting the information content of the local economy and market prices (Obwona, 2001). Many authors suggest that locational advantages related to economic policy and history are critical in attracting FDI (Kinoshita and Campos, 2003; Pugel, Kragas, and Kimura, 1996), while many economic regions have experienced inverse relationships between inflation and economic growth (Briault, 1995; Fisher, 1993; Obwona 2001; Sarel, 1996).

When attempting to attract international business, exchange rates can offer additional concerns and uncertainty. Pontines (2011) found that developing nations practicing inflation targeting had lower nominal and real exchange rate volatility than non-inflation targeters, while Prasertnukul et al. (2010) also found declines in exchange rate volatility for developed and developing inflation targeting nations. With inflation targeting nations finding declining levels of inflation and increased stability of both inflation and exchange rates, Mason and Vracheva (2017) extended this literature and found that inflation targeting nations experienced larger increases in their FDI than non targeters, for both Total FDI and FDI Inflow.

The Role of Economic Development

Although inflation targeting has helped nations of every economic level with their inflation and exchange rates, it may be most effective for developing nations (Goncalves and Salles, 2008, Mason and Vracheva 2017). Typically, countries considered to be developed economies have already created and maintained historical economic success, and establishing these reputations certainly helps in attracting FDI. Ferreira de Mendonca and de Guimaraes e Souza (2012) found that inflation targeting is the ideal monetary policy for developing economies because it helps bring inflation rates down to "internationally acceptable levels". Calvo and Mishkin (2003) also suggest developing nations have more to gain from inflation targeting because they typically suffer from weak fiscal, financial, and monetary institutions. Fraga et al. (2004) explains how developing nations have the difficult challenge of balancing low credibility and fragile economic institutions with higher macroeconomic instability and vulnerability to economic shocks.

The primary goal of inflation targeting is to reduce and stabilize inflation, however, expected secondary effects are a positive reputation for domestic monetary institutions, overall economic stability, and increased international business (Fraga et al., 2004; Green, 1996; Roger, 2010). Garrett (2000) suggests

that in order for a nation's domestic economy to succeed, they first must grow through their international trade. Kinoshita and Campos (2003) looked at transition economies in Eastern Europe, finding that successful implementation of economic reform leading to both stable economic performance and low inflation were strong signals for attracting FDI. The wider realm of opportunities to positively impact a developing nation's economy, along with their desire for increased international trade leads us to our first hypothesis.

Hypothesis 1: *Lower economically developed nations will see greater increases in FDI from Inflation Targeting than highly developed nations.*

When looking at the five regional-cultural clusters (Table 2) there seem to be two different types of groups. Of the 16 inflation targeting and control nations within the Anglo and Nordic clusters, all but South Africa are considered to be high income nations by the World Bank. For the Eastern European, East Asian, and Latin American clusters, only 11 of the 33 total nations are considered high income. The Latin American cluster is the least developed with just one high income nation as an inflation targeter, and one as a control nation out of the 11 countries. If hypothesis 1 is significantly supported then our second hypothesis should also hold true.

Hypothesis 2: *Regional-Cultural clusters with more middle income nations will see greater increases in FDI from Inflation Targeting than clusters with more high income nations.*

METHODS AND DATA

Sample

Our sample includes 32 inflation targeting nations, as well as 22 control nations, separated into five regional-cultural clusters. For inflation targeting nations that adopted the monetary policy part way through our sample time, their pre-inflation targeting years are also used as control observations. Our regional-cultural clusters are found in Table 2. Five sources were used when developing our clusters. The primary source used is the widely cited and respected article on clustering suggested by Ronen and Shenkar (1985), they include 19 of the 32 inflation targeting nations in their work. The majority of our non-inflation targeting (control) nations were also collected from their influential study. Two additional academic articles, Sirota and Greenwood (1971) and Mason and Vracheva (2017) were then used to help develop our clusters, which both articles overlap significantly with Ronen and Shenkar (1985). Closing in on the final sample we pulled economic classifications from both the World Bank and International Monetary Fund databases. The World Bank data bank's descriptions of high income, upper middle income, and lower middle Income were used to break down our regression samples based on economic development. Each Inflation Targeting nation's World Bank classification is shown in Table 1. Armenia, Ghana, Georgia, India, and Kazakhstan are the only inflation targeting nations without a natural regional-cultural cluster.

The sample nations consist of a wide range of economic levels. Of the 32 inflation targeting nations 12 are considered high income by the World Bank, 14 are upper middle income, and 6 lower middle income. Making up the 22 control nations 14 are high income, 5 upper middle income, and 3 lower middle income. For the 32 countries adopting the inflation targeting monetary policy, their adoption time represents 18 different years of the possible 29-year range. New Zealand was the first to implement the strategy in 1990, while Argentina and India are the most recent in 2016. Table 1 provides a complete list of the adoption years. Due to the availability of data our final sample time frame is 1996-2018. Government and Economic control variables from the World Bank are unavailable prior to 1996. Additionally, within the World Bank's data bank, many of the less developed nations lack sufficient data throughout the 1990s.

TABLE 2
REGIONAL-CULTURAL CLUSTER

This table provides the cluster groups developed for proper control nations to be used. Data used was taken primarily from Ronen and Shenkar (1985). In addition, data was taken from Mason and Vracheva (2017), Sirota and Greenwood (1971), the World Bank, and the International Monetary Fund, as well as previous inflation targeting article samples. Armenia, Ghana, Georgia, India, and Kazakhstan are inflation targeting countries without a natural cluster.

	Anglo	Eastern European	East Asian	Latin American	Nordic
Inflation Targeting Nations	Australia	Czech Republic	Indonesia	Argentina	Iceland
	Canada	Hungary	Philippines	Brazil	Norway
	Israel	Poland	Republic of Korea	Chile	Sweden
	New Zealand	Romania	Thailand	Colombia	
	South Africa	Russia		Guatemala	
	United Kingdom	Serbia		Mexico	
		Turkey		Peru	
Non-Inflation Targeting Nations	Austria	Bulgaria	China	Ecuador	Denmark
	Ireland	Croatia	Hong Kong	Honduras	Finland
	Switzerland	Greece	Japan	Paraguay	Netherlands
	United States	Slovak Republic	Malaysia	Uruguay	
			Singapore	Venezuela	
			Vietnam		

Variables

Our primary variable of interest is if the nation is implementing inflation targeting (IT) or not. If the country follows the inflation targeting monetary policy framework the IT dummy variable will take on the value of 1, while non-inflation targeting nations take on the value of 0. The IT variable was collected and cross checked between Hammond (2012) and Roger (2010) who each provide a comprehensive list of inflation targeting nations according to the Bank of England and IMF, respectively. Since the 2012 inflation targeting summary provided by Hammond (2012) there has not been a similar widely circulated summary article including more recent adopters of the inflation targeting framework. To update the list we cross referenced various academic articles published post 2012 with the respected nations central bank websites to confirm both adoption of inflation targeting, and the year of formal adoption.

The dependent variables we use as a proxy for international trade are based on Foreign Direct Investment (FDI) extracted from the World Bank data bank [3]. International cash flows can vary significantly between inflows and outflows for many nations. To account for this we use three FDI variables. First, we test the annual total Foreign Direct Investment (FDIT), followed by FDI inflows (FDIIN) and outflows (FDIOUT). The World Bank measures their FDI variables as a percentage of each nation's annual real GDP. This allows for a measure of international trade that will not be skewed simply by the typical growth of an economy for a given year.

The reputation of a given nation's economic and political agencies is critical in determining their ability to attract and engage in international trade (Bevan and Estrin, 2004; Biswas, 2002; Schneider and Frey, 1985). To account for this, we collect four control variables from the Worldwide Governance Indicators database provided by the World Bank. Each indicator is graded on a five-point scale where a riskier nation will have a lower value based on their control of corruption (CORRUPT), rule of law (LAW), government effectiveness (GOVEFF), and voice and accountability (VOCACCT) [4]. From 1996 to 2002 the Worldwide Governance Indicators were only established during the even numbered years. For this reason, we use an average of the two surrounding years to provide a statistic for the odd numbered years (Mason and Vracheva, 2017). Applying these control variables evens out the playing field for a given nation's ability

to engage in and attract international trade based on economic and political reputation (Kaufmann, Kraay, and Mastruzzi, 2011).

In addition to the governance indicators that are more political and/or regulation based, we also apply a few financial-economic control variables. First, we use a control variable for market size, measured by GDP per capita (GDPPC). This controls for the size and production habits of the economy and is commonly used throughout the inflation targeting literature (Abo-Zaid and Tuzemen, 2012; Goncalves and Salles, 2008; Neumann and von Hagen, 2002; Siregar and Goo, 2010). From Mollick et al. (2011) and Ferreira de Mendonca and Guimaraes e Souza (2012) we apply a control for a given nation's tendency to engage in international trade (OPENNESS), which is measured as the percentage of imports and exports out of total GDP. We next control for country size with a variable for population (POPULATION), taking the log value of the annual population for each nation. The last control variable is the three-year average lagged value of the annual percentage of inflation (LAGINFL), in order to give potential international trade partners time to react to the previous year's inflation of a potential trade partner. Obwona (2001) expresses that creating a favorable climate for investment takes time to develop the partnership between the government and the private sector, demanding a certain level of transparency. Following the practice of Goncalves and Salles (2008) we remove 36 observations with annual inflation greater than 50%, which is considered Hyper-inflation and an anomaly.

TABLE 3
INFLATION TARGETING SUMMARY CHARACTERISTICS

FDIT is total foreign direct investment (fdi) as a percentage of gross domestic product (gdp). FDIIN is the total inbound fdi as a percentage of gdp. FDIOUT is the total outbound fdi as a percentage of gdp. IT is a binary variable where one signifies if the country was an inflation targeter during the observation year. CORRUPT is a measurement of the nation's control over their corruption on a scale from zero to five. LAW is a measurement of the nation's rule of law on a scale from zero to five. GOVEFF is a measurement of the effectiveness of a nation's government on a scale from zero to five. VOCACCT is a measurement of the nation's voice and accountability rights on a scale from zero to five. GDPPC is the gdp per capita based in current US$. LAGINFL is the three year lagged average inflation percentage based on the consumer price index. OPENNESS is the total US$ value of imports and exports as a percentage of gdp. POPULATION is the log value of the nation's total population. Each variable is based on the individual country year observation.

Variable	Obs.	Mean	Std. Dev.	Min	Max
FDIT	1,172	7.92363	15.18544	-96.6886	156.9975
FDIIN	1,197	4.80451	7.773853	-46.7692	86.61077
FDIOUT	1,154	3.185205	8.041373	-49.9194	71.35508
IT	1,206	0.427032	0.494852	0	1
CORRUPT	1,200	2.980792	1.16081	0.86	5
LAW	1,206	2.934407	1.059791	0.68	4.6
GOVEFF	1,206	3.10524	0.98003	0.96	4.87
VOCACCT	1,206	2.915726	0.90076	0.49	4.33
GDPPC	1,206	19108.59	20083.85	258.4709	103059.3
LAGINFL	1,199	14.20779	88.61369	-3.1177	1774.855
OPENNESS	1,201	88.16648	65.53845	15.63559	442.62
POPULATION	1,206	7.303159	0.676686	5.429616	9.143867

Table 3 provides summary statistics for the independent variables, offering a total country-year observation sample of 1206. The IT mean of 0.427 indicates that nearly half of the sample year observations are provided by inflation targeting nations. The FDI inflows (FDIIN) account for just over 60 percent of

total FDI for the full sample. The maximum corruption (CORRUPT) score is exactly five due to a few Scandinavian (Nordic) nation's extremely low levels of measured corruption.

Table 4 provides the correlation matrix f or our independent variables. A couple of the governance indicators experience correlations above 80 and 90 percent; however, this was expected due to the small precision scale and unavoidable overlap in the measurement criteria. As Allison (2012) explains, as long as the collinear variables are used strictly as control variables, and are not collinear with your variable of interest, there is no issue with the high correlations.

TABLE 4
INFLATION TARGETING CORRELATION MATRIX

IT is a binary variable where the value of one signifies that the country was an inflation targeter during the observation year. CORRUPT is a measurement of the nation's control over their corruption on a scale from zero to five. LAW is a measurement of the nation's rule of law on a scale from zero to five. GOVEFF is a measurement of the effectiveness of a nation's government on a scale from zero to five. VOCACCT is a measurement of the nation's voice and accountability rights on a scale from zero to five. GDPPC is the gdp per capita based in current US$. LAGINFL is the three year lagged average inflation percentage based on the consumer price index. OPENNESS is the total US$ value of imports and exports as a percentage of gdp. POPULATION is the log value of the nation's total population. Each variable is based on the individual country year observation.

	IT	CORRUPT	LAW	GOVEFF	VOCACCT	GDPPC	LAGINFLPC	OPENNESS	POPULATION
IT	1								
CORRUPT	0.0828	1							
LAW	0.0936	0.962	1						
GOVEFF	0.0828	0.9602	0.9677	1					
VOCACCT	0.1753	0.8274	0.8443	0.8029	1				
GDPPC	0.0164	0.7763	0.7811	0.7569	0.6283	1			
LAGINFLPC	-0.0968	-0.1187	-0.1248	-0.1351	-0.1018	-0.1116	1		
OPENNESS	-0.2188	0.2847	0.2857	0.3307	0.0202	0.1952	-0.0555	1	
POPULATION	0.0479	-0.3892	-0.3389	-0.3269	-0.3809	-0.3011	-0.007	-0.3360	1

Estimation Procedure

To investigate the statistical relationship between the primary variable of interest (IT), the political and economic control variables, and the dependent variables regarding FDI, we run a GLS random effects regression analysis. The chi-squared statistic from the Housman test was 0.5181, which is greater than 0.05, therefore confirming random effects is the preferred method to apply instead of fixed effects. The first dependent variable equation is shown here:

$$FDI_{it} = \beta_1 + \beta_2 IT_{it} + \beta_3 CORRUPT_{it} + \beta_4 LAW_{it} + \beta_5 GOVEFF_{it} + \beta_6 VOCACCT_{it} + \beta_7 GDPPC_{it} + \beta_8 LAGINFLPC_{it} + \beta_9 OPENNESS_{it} + \beta_{10} POPULATION_{it} \quad (1)$$

where i indexes the nation, and t indexes the year. We complete this same regression for each of the three dependent variables, which were discussed previously in the Sample section.

EMPIRICAL RESULTS

In this section we present the main results of our study. Table 5 shows our sample broken down by economic class, providing separate regressions for high income, upper middle income, and lower middle income nations. Each economic class uses three dependent variables, FDI total, FDI inflow, and FDI outflow in order to test our primary variable of interest, the IT dummy variable. Table 5 provides support for hypothesis 1, less developed nations see greater increases in FDI than more developed nations relative to their non-inflation targeting control nations. Lower middle income, the lowest economic class we test, is

the only category to find statistically significant results that adopting the inflation targeting policy leads to increased FDI. This result holds for both total FDI and FDI inflows, but is not significant for FDI outflows. No regressions for upper middle income or high income found IT to be significant, suggesting that nations with more prominent issues of high inflation and inflation volatility are best suited to benefit from adopting the inflation targeting monetary policy. The finding that more developed nations are not benefiting from inflation targeting corresponds with both Lin and Ye (2007) who found no significance in helping high income nations control their inflation, and Ball and Sheridan (2004) who found no significance of inflation targeting helping to improve a nation's macroeconomic variables. Openness is the most significant control variable, having a positive relationship with the DVs in 5 of the 9 regressions. This makes intuitive sense and helps develop and support hypothesis 1 in that Openness is significant in increasing all FDI cash flows for the high income regressions, and only significant in increasing FDI out flows for upper middle income and lower middle income.

TABLE 5
WORLD BANK INCOME CLASS: RANDOM EFFECTS RESULTS

Full sample random effects regression with three measurements of foreign direct investment (fdi) as the dependent variable for three sample groups. FDIT is total fdi as a percentage of gross domestic product (gdp). FDIIN is the total inbound fdi as a percentage of gdp. FDIOUT is the total outbound fdi as a percentage of gdp. IT is a binary variable where a value of one signifies if the country was an inflation targeter during the observation year. CORRUPT is a measurement of the nation's control over their corruption on a scale from zero to five. LAW is a measurement of the nation's rule of law on a scale from zero to five. GOVEFF is a measurement of the effectiveness of a nation's government on a scale from zero to five. VOCACCT is a measurement of the nation's voice and accountability rights on a scale from zero to five. GDPPC is the gdp per capita based in current US$. LAGINFL is the three year lagged average inflation percentage based on the consumer price index. OPENNESS is the total US$ value of imports and exports as a percentage of gdp. POPULATION is the log value of the nation's total population. Each variable is based on the individual country year observation. P-values are provided in parenthesis, where * indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level.

	LOWER MIDDLE INCOME			UPPER MIDDLE INCOME			HIGH INCOME		
	FDIT	**FDIIN**	**FDIOUT**	**FDIT**	**FDIIN**	**FDIOUT**	**FDIT**	**FDIIN**	**FDIOUT**
IT	1.9708**	1.8673**	0.2250	-0.3481	-0.4641	-0.0217	-0.2480	-0.3124	0.0145
	(0.037)	(0.023)	(0.211)	(0.617)	(0.291)	(0.913)	(0.913)	(0.745)	(0.992)
CORRUPT	2.3611	2.7634*	-1.0596	2.8795	2.2303	0.9968	5.1119	1.7872	3.1754*
	(0.293)	(0.066)	(0.205)	(0.254)	(0.130)	(0.388)	(0.185)	(0.439)	(0.066)
LAW	0.0198	0.9096	-0.1976	0.9337	0.5031	-0.0506	4.0573	4.0752*	0.0958
	(0.990)	(0.492)	(0.590)	(0.607)	(0.693)	(0.943)	(0.321)	(0.094)	(0.966)
GOVEFF	-1.0842	-1.7257**	1.116**	-1.7141	-1.8064	0.1774	-5.7658	-3.8218	-2.1505
	(0.349)	(0.012)	(0.041)	(0.397)	(0.126)	(0.838)	(0.321)	(0.176)	(0.486)
VOCACCT	-1.0466	-0.4322	0.1537	-0.9770	0.3039	-0.3513	-2.8083	-2.1025*	-0.4354
	(0.322)	(0.622)	(0.413)	(0.438)	(0.781)	(0.364)	(0.332)	(0.073)	(0.830)
GDPPC	-0.0001	-0.0001	0.0001*	0.0001	0.0000	0.0002***	0.0001	0.0000	0.0001
	(0.875)	(0.624)	(0.063)	(0.321)	(0.730)	(0.002)	(0.317)	(0.688)	(0.181)
LAGINFL	-0.0332	-0.0156	0.0101	-0.0026	-0.0100	0.0263**	0.1071	0.0743	0.0275
	(0.544)	(0.745)	(0.548)	(0.951)	(0.681)	(0.028)	(0.527)	(0.488)	(0.710)
OPENNESS	0.0239	0.0230	0.0049**	0.0260	0.0158	0.0161**	0.1308***	0.0700***	0.0629***
	(0.331)	(0.219)	(0.016)	(0.187)	(0.205)	(0.045)	(0.002)	(0.000)	(0.004)
POPULATION	-0.0430	-0.6757	0.2472***	-2.0012	-1.5835	0.2215	3.3440	1.1360	2.2297
	(0.949)	(0.224)	(0.002)	(0.107)	(0.153)	(0.621)	(0.337)	(0.392)	(0.312)
CONS	3.7490	3.1321	1.7927**	9.3336***	5.6674***	4.5467***	7.8156***	4.5710***	3.2433***
	(0.529)	(0.519)	(0.042)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R-Squared	0.071	0.107	0.035	0.003	0.016	0.011	0.052	0.049	0.054
Observations	179	199	179	391	396	370	590	590	593

In Table 6 we use the same regression procedure of 3 FDI dependent variables for each of the regional-cultural clusters provided in Table 2. The results provide statistically significant support for hypothesis 2.

We provide regression analysis for each regional-cultural cluster individually and hypothesized that the clusters with a larger representation of developing nations, rather than developed nations, would see greater increases in FDI from adopting inflation targeting. The Anglo and Nordic clusters are dominated by high income economies, while the Eastern European, East Asian, and Latin American clusters primarily include middle income economies. The stats show that the Eastern European and Latin American clusters benefit the most from inflation targeting. IT is statistically significant in increasing both the total FDI and FDI inflow for Eastern European nations utilizing inflation targeting, while also providing a significant increase for Latin American adopters for all three DVs. IT was not found to be statistically significant for any FDI variable within the Anglo, East Asian, or Nordic clusters. With two of the three clusters dominated by middle income nations having at least two of three FDI dependent variables being increased by inflation targeting, along with zero FDI significance for the high income nations or clusters, we provide conclusive evidence in support of hypothesis 2. Overall, significant support of both hypothesis 1 and hypothesis 2 suggest that the monetary policy of inflation targeting is best suited for helping the least developed economies in attracting FDI.

TABLE 6
CULTURAL AND REGIONAL CLUSTERS: RANDOM EFFECTS RESULTS

Full sample random effects regression with three measurements of foreign direct investment (fdi) as the dependent variable for three sample groups. FDIT is total fdi as a percentage of gross domestic product (gdp). FDIIN is the total inbound fdi as a percentage of gdp. FDIOUT is the total outbound fdi as a percentage of gdp. IT is a binary variable where a value of one signifies if the country was an inflation targeter during the observation year. CORRUPT is a measurement of the nation's control over their corruption on a scale from zero to five. LAW is a measurement of the nation's rule of law on a scale from zero to five. GOVEFF is a measurement of the effectiveness of a nation's government on a scale from zero to five. VOCACCT is a measurement of the nation's voice and accountability rights on a scale from zero to five. GDPPC is the gdp per capita based in current US$. LAGINFL is the three year lagged average inflation percentage based on the consumer price index. OPENNESS is the total US$ value of imports and exports as a percentage of gdp. POPULATION is the log value of the nation's total population. Each variable is based on the individual country year observation. P-values are provided in parenthesis, where * indicates significance at the 10% level; ** indicates significance at the 5% level; *** indicates significance at the 1% level.

	ANGLO			EASTERN EUROPEAN			EAST ASIAN			LATIN AMERICAN			NORDIC		
	FDIT	**FDIIN**	**FDIOUT**	**FDIT**	**FDIIN**	**FDIOUT**	**FDIT**	**FDIIN**	**FDIOUT**	**FDIT**	**FDIIN**	**FDIOUT**	**FDIT**	**FDIIN**	**FDIOUT**
IT	2.3056	1.6462	0.5838	2.0988**	1.5556**	0.5779	-3.6319	-0.2631	-2.5075	1.098**	0.5232*	0.5191***	2.2640	0.5597	1.7043
	(0.324)	(0.277)	(0.570)	(0.045)	(0.049)	(0.414)	(0.172)	(0.840)	(0.126)	(0.013)	(0.086)	(0.007)	(0.697)	(0.826)	(0.610)
CORRUPT	8.0015*	4.4663**	3.6669	2.6447	0.8009	1.4259	-5.9518*	-1.1801	-2.7987	3.0734**	2.2502**	0.6125	2.9101	3.4312	-0.5218
	(0.051)	(0.039)	(0.109)	(0.450)	(0.702)	(0.327)	(0.091)	(0.566)	(0.221)	(0.026)	(0.031)	(0.121)	(0.861)	(0.691)	(0.949)
LAW	-1.2050	1.1916	-2.4978	-9.4024*	-5.5471**	-2.6118	2.4056	3.8877**	-1.1551	3.4652**	3.0654***	1.3875**	30.2127	10.7318	19.4810
	(0.847)	(0.721)	(0.466)	(0.082)	(0.033)	(0.304)	(0.264)	(0.018)	(0.214)	(0.036)	(0.001)	0.034	(0.322)	(0.454)	(0.243)
GOVEFF	7.3786*	3.382**	4.1240	0.9954	0.7022	0.1840	-3.9136	-4.3259***	-0.3782	-2.3531*	-2.4418***	-0.3800	-9.6745	-8.7626	-0.9118
	(0.092)	(0.042)	(0.174)	(0.636)	(0.684)	(0.823)	(0.360)	(0.005)	(0.890)	(0.089)	(0.006)	(0.329)	(0.720)	(0.465)	(0.953)
VOCACCT	-15.3382**	-10.8305***	-5.0737	7.1901	4.4600*	1.6252	8.4673	1.6640	5.1535***	-3.367*	-2.4459**	-1.5744***	-0.9022	-1.5343	0.6321
	(0.031)	(0.006)	(0.285)	(0.197)	(0.054)	(0.548)	(0.002)	(0.103)	(0.009)	(0.058)	(0.020)	(0.000)	(0.958)	(0.880)	(0.931)
GDPPC	0.0001	0.0000	0.0001	0.0000	-0.0001***	0.0001**	0.0003***	0.0002***	0.0002***	0.0001	0.0000	0.0001***	-0.0002	-0.0001	-0.0001
	(0.808)	(0.536)	(0.534)	(0.840)	(0.001)	(0.048)	(0.000)	(0.000)	(0.000)	(0.171)	(0.758)	(0.001)	(0.278)	(0.280)	(0.292)
LAGINFL	0.1419	0.0105	0.1272	0.0439	0.0115	0.0180	-0.2326	0.0631	-0.1810	0.0050	-0.0006	0.0102	0.5096	0.1627	0.3469
	(0.657)	(0.937)	(0.521)	(0.372)	(0.765)	(0.356)	(0.392)	(0.469)	(0.144)	(0.872)	(0.981)	(0.393)	(0.639)	(0.793)	(0.464)
OPENNESS	0.3279***	0.1872***	0.1434***	0.0485**	0.0290*	0.0250**	0.2113***	0.1006***	0.0928***	0.0505*	0.0495**	0.0091	0.533***	0.2422***	0.2909***
	(0.000)	(0.000)	(0.001)	(0.034)	(0.057)	(0.016)	(0.000)	(0.000)	(0.000)	(0.100)	(0.031)	(0.116)	(0.002)	(0.001)	(0.003)
POPULATION	9.7382***	5.7119***	4.1658**	1.8387	-0.5676	2.2217	16.1968***	7.1000***	6.7409***	1.4385	1.8855*	-0.0120	2.8410	1.5511	1.2899
	(0.008)	(0.007)	(0.029)	(0.537)	(0.573)	(0.150)	(0.000)	(0.000)	(0.000)	(0.355)	(0.087)	(0.968)	(0.815)	(0.754)	(0.858)
CONS	11.1259***	9.8785***	4.576***	4.6464**	1.9368	2.3659***	-3.1476***	-0.4314	-0.7814	9.6451***	6.6307***	3.6167***	-11.669	2.668	-14.337
	(0.000)	(0.000)	(0.000)	(0.020)	(0.118)	(0.002)	(0.004)	(0.608)	(0.165)	(0.000)	(0.000)	(0.000)	(0.875)	(0.934)	(0.738)
R-Squared	0.054	0.078	0.033	0.017	0.026	0.017	0.285	0.266	0.231	0.113	0.159	0.066	0.019	0.032	0.012
Observations	227	227	227	230	232	231	206	220	208	261	264	240	137	137	137

CONCLUSION

This paper provides the most thorough analysis of the impact of inflation targeting on foreign direct investment to various national economic classifications. The majority of previous empirical research on inflation targeting has focused on, and found, a significant impact in both the reduction and decline in volatility of inflation. Inflation targeting has also been found to increase GDP growth, reduce exchange rate volatility, and provide a more credible reputation for monetary policy authorities in a given nation. While controlling for these previously tested macroeconomic variables, we find similar positive results relating inflation targeting nations to FDI as the dependent variables.

Overall, from a sample of 1,206 country-year observations including 32 inflation targeting nations and 22 control nations from 1996 to 2018, the inflation targeting monetary policy was found to have a positive significant influence on attracting FDI to less developed nations, which is consistent with some past literature regarding inflation targeting (Calvo and Mishkin, 2003; Fraga et al., 2004; Goncalves and Salles, 2008, Mason and Vracheva, 2017), Our results provide strong support for both hypothesis 1 and hypothesis 2, which each suggest that adopting inflation targeting is more influential in helping less developed nations grow their economy than it is for more developed nations. Although past empirical research has not shown the same separation, these past results are likely influenced by the shorter time frame for which developing nations have been practicing the inflation targeting policy. Brazil was the first developing nation to adopt inflation targeting in 1999, while nine developed economies preceded them. Now that we have sufficient data for both developed and developing nations, the separation of where the young monetary policy can be most effective is becoming clearer.

Extending the literature, we also provide the most comprehensive empirical study that applies inflation targeting analysis to all regional-cultural clusters around the world. The majority of past inflation targeting literature focuses on one region at a time, limiting its global interpretation. Our analysis shows that not only are the least developed nations benefiting the most form adopting the inflation targeting monetary policy, but extends the research to show specially what regional-cultural clusters have benefited the most. The clusters of the Eastern European transition economies, along with the Latin American nations of South America have experienced the greatest economic progression from inflation targeting. The more advanced clusters of the high income Anglo and Nordic nations do not see the same progress with growing their international trade from inflation targeting that less developed nations have been experiencing.

As young as the inflation targeting policy is, just 30 years in practice for the first adopter, New Zealand, we may still not have a sufficient amount of data to properly analyze the relationship at this point in time, especially for the more recent adopting nations, which are primarily developing economies. The trend of nations adopting the inflation targeting monetary policy stalled following the 2008 financial crisis, but the last few years have seen a resurgence in its popularity, especially for developing economies. As countries continue practicing, and more countries join the trend, new research will be critical for further analysis of inflation targeting. Future research may also explain if there is a plateau and/or eventual reversal of the initial positive impacts.

In sum, our results provide two primary contributions to the inflation targeting literature: (i) inflation targeting has a positive impact on attracting FDI for lower middle Income nations, but not for upper middle income or high income nations; (ii) inflation targeting is most successful in regional-cultural clusters with a larger representation of middle income nations rather than high income nations.

ENDNOTES

1. Hammond (2012) provides both formal and informal adoption dates for Ghana, Israel, Republic of Korea, Serbia, and Sweden. Consistent with the majority of inflation targeting studies, we use formal adoption dates.
2. Hammond (2012) provides the most comprehensive collection of inflation targeting nations. For nations referred to as an inflation targeter in more recent literature, the respected nations' central bank websites were utilized to confirm an official adoption of inflation targeting, as well as the adoption year.

3. The World Bank Data Bank defines FDI as the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows total net, that is, net FDI in the reporting economy from foreign sources less net FDI by the reporting economy to the rest of the world. Data are in current U.S. dollars.
4. Kaufmann, Kraay, and Mastruzzi (2011) provide more in-depth definitions for each governance indicator.

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