

Analyzing the Treatment Effects of Inflation-Targeting Adoption on FDI Flows

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Abstract

Many economists acknowledge the paramount role that foreign investment plays in fostering economic development and growth via integrating economies around the globe. Studies have shown that foreign investment, particularly foreign direct investment (FDI) is attracted to countries that exhibit good governance, low uncertainty and a high degree of macroeconomic stability. The literature also argues that monetary policy under inflation targeting (IT) mitigates uncertainty, enhances governance and brings macroeconomic stability to the adopting countries. Hence, it would seem that the IT-adoption should enable the adopting countries attract the largest FDI inflows. To verify this conjecture, this study performs a comparison between the IT-adopting countries and the non-adopters in attracting FDI. Using a panel of OECD and middle-income countries, the empirical findings exhibit an interesting but contradicting pattern: when it comes to the OECD countries, the results show that the IT-adopters do better than the non-adopters in attracting the FDI inflows. For the middle-income countries, however, the IT-adoption appears to have the opposite effect: a significant reduction in the FDI inflows is witnessed among the IT-adopters compared to their counterparts. The results are robust to the post-estimation sensitivity tests recommended for such empirical analysis.

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1. Introduction

Many economists acknowledge the beneficial role of foreign investment for economic development and growth sustainability. The importance of this role has become even more visible in light of the historical freedom that foreign investment has enjoyed in its mobility over the past few decades. According to OECD (2014), foreign investment, particularly foreign direct investment (FDI) has been acting as a catalyst for technological change, competition and expansion. The FDI flows play a paramount role in fostering economic development and growth by integrating economies around the globe. For example, Ary Tanimoune et al. (2013) regard FDI as a crucial element behind the intense Chinese economic growth since the 1990s.

In the recent past, there has been an upward trend in the FDI flows, where countries in every category – advanced, emerging and developing – have enjoyed increased FDI inflows. The global stock of FDI in 2014 reached \$25.5 trillion (about 33% of the world's GDP) while the FDI flows are expected to reach \$1.87 trillion in 2016.¹

Given this upward trend in the FDI flows and the freedom of cross-border mobility, a rigorous competition has emerged among countries to attract FDI. This competition has granted the foreign investors the luxury to select a low-risk-high-return environment for their investments. According to the literature, the key determinants of a low-risk-high-return environment in the eyes of the foreign investors are good governance, less uncertainty and macroeconomic stability. The policymakers are keen to design macroeconomic policies that signal their commitment to fostering governance, mitigating uncertainty and safeguarding macroeconomic stability. A voluminous literature has attempted to discuss both the concerns of foreign investors and the different

¹ The stock of FDI at end-2013 was approximately ten times more than at end-1990 (OECD, 2014). Also see UNCTAD's annual World Investment Report 2014.

approaches that policymakers have taken to downplay those concerns. One of these approaches is the inflation-targeting regime (ITR), a monetary policy framework. Inflation targeting has garnered an outstanding tribute for mitigating uncertainty, enhancing the governance institutions and bringing the overall macroeconomic stability to the adopting countries. These are precisely the conditions best suited for FDI in a recipient country. Thus, there seems to be a nexus between FDI and inflation targeting. This apparent nexus leads us to conjecture that the IT-adoption is conducive to FDI. We attempt to test the validity of this conjecture by empirically investigating the performance of the IT-adopting countries in attracting FDI, and then comparing them to those countries that have not adopted inflation targeting. This attempt is two-fold: First, we look at a large sample that includes the inflation-targeting countries and the non-targeters, both high and middle-income countries, due to the fact that the IT-member club is a mixture of the two kinds. The findings from this large sample indicate that the IT-adoption has increased the FDI inflows. Second, we cluster our large sample into two sub-samples: the OECD and the MIC countries. We first investigate the OECD sample, which mainly comprises advanced and rich economies, and compare the performance of the IT-OECD countries with the ones that did not adopt IT.² The results for this sub-sample are in line with the large sample results: IT-adoption has led to an increase in the FDI inflows. We then repeat the same empirical exercise for the second sub-sample that comprises only middle income countries (MICs). Surprisingly, the results for the MIC-sample are contradictory to the previous results: IT-adoption among the MICs appears to have restrained the FDI inflows.

As a consequence, the rest of the paper is organized as follows. Section 2 offers a detailed presentation on the definition of FDI, advantages and disadvantages of FDI. Section 3 presents a

² Except for three countries namely Hungary, Mexico and Turkey that are classified as middle income countries.

brief review of the theory behind FDI and the determinants of FDI. Section 4 discusses briefly the determinants of FDI from the literature. Section 5 presents a brief review of the literature on inflation targeting, and builds on the previous section to identify some of the apparent linking features between FDI and the ITR, in an attempt to find the nexus between the two and formalize the earlier conjecture. Section 6 describes the data and methodology used in this study. Section 7 presents and analyzes the empirical results and the robustness checks. Section 8 offers the concluding remarks and the future research venues.

2. Foreign Direct Investment (FDI)

Of all the capital flows across international borders, the most preferred flows from the standpoint of policymakers are FDI inflows. This preference stems from the fact that during economic and financial crises, FDI has demonstrated its resilience as opposed to the other types of capital flows, such as foreign portfolio investment (FPI) and the sovereign debt investments. For example, during the two notorious crises, the Mexican debt crisis and the Asian currency crisis, it was observed that the sudden fleeing of FPI exacerbated these crises.³

2.1 What is FDI? FDI is defined in the IMF Balance of Payment Manual (1993) as *‘the category of international investment that reflects the objective of a resident entity in one economy obtaining a lasting interest in an enterprise resident in another economy’*. Here the resident entity refers to the foreign investor and the enterprise resident is the firm subject to the foreign investment. The term ‘lasting interest’ entails a long-term relationship where the investor has decision-making

³ Albuquerque (2003) states that in Mexico, the FPI flows dropped by 89% in just one year from 1994 to 1995, but the FDI flows dropped by 27% in two years from 1994 to 1996 only to recover fully one year later in 1997. East Asian countries experienced a 22% drop in FPI flows during the Asian currency crisis of 1997-98 compared to a less than 5% drop in FDI flows.

powers. Ownership of 10% or more of the shares in the enterprise is required for a foreign investment to be classified as a ‘direct investment’.

2.2 Advantages of FDI: Seldom a topic has enjoyed as much attention from academia and policymakers as did the FDI. The bulk of this literature has nothing but praise for FDI:⁴ A new entry in a domestic market in the form of FDI creates a competitive environment that will enhance efficiency and productivity. FDI is well known for transferring new technology and innovative capabilities to the recipient economy, and thus boosting productivity. In addition, it also contributes to domestic human capital development either directly by hiring domestic labor and training them or through spill-over effects by doing business with the domestic suppliers. The multinational corporations (MNCs) tend to trade with their affiliates and existing customers in either home country or in other countries, and this creates more opportunities for exports of the recipient economy. FDI also helps raise the operating standards in the recipient economy, such as environment and social standards. Hausmann and Fernandez-Arias (2000) describe FDI as ‘good cholesterol’ and justify this labeling of FDI by the fact that during economic downturns, unlike portfolio investment, FDI has mainly demonstrated its resilience, perhaps due to the fact that losses stemming from the economic downturns are considered to be a lesser evil than those resulting from disinvestment in FDI.

Disadvantages of FDI: There are also some challenges and disadvantages attached to FDI. Williams and Williams (1999) briefly summarize these disadvantages: FDI can have a ‘crowding out’ effect on domestic private investment and may discourage new market entrants because of fierce foreign competition. The recipient country may lose a substantial amount of revenues because of the incentive packages offered to FDI and because of an adverse reaction from domestic

⁴ For a detailed look at these advantages see Igbokwe et al. (2010), Dolzer et al. (2006), Moran et al. (2005), Wei and Balasubramanyam (2004) and Beltz (1995).

investors. In countries where distortions exist – both in financial and trade sectors – FDI may take advantage of these distortions, so that these additional distortions will cost more to the recipient country than the FDI contribution to benefits.⁵ FDI with a small-scale infrastructure, such as an assembly plant, may abruptly wrap up its operations due to an economic downturn in the home or the recipient country, or for any other reason, which may exacerbate a potential crisis or have a negative impact on the local economy.

3. The Theory Behind FDI

The FDI decisions involve not only the investing firm's objectives, such as profit-maximization and cost-minimization, but they also involve the host-country's objectives, such as socio-economic welfare-maximization. Modeling of the FDI decisions, therefore, becomes quite a complex task, and this complexity makes a unified formal work on FDI nearly impossible. Given the existence of at least two players in the FDI decision-making, we see that most of the formal FDI literature takes two major approaches: the firm's approach and the country's approach. The theoretical models of the firm's approach build on the microeconomic firm/production theory, while the country's approach utilizes the macroeconomic trade/welfare theory. These two approaches have expanded further into numerous branches. We discuss some of them here.

3.1 The Micro-Theory of FDI: The seminal work of Dunning (1993) provides a comprehensive analysis of the three mainstream theories on FDI that have applied the microeconomic approach: The first of them is the industrial organization (IO) theory by Hymer (1960), which is one of the earliest theories on FDI from a firm's perspective. This theory relaxes the neo-classical assumption of perfect competition, asserting that markets are imperfect, and this market-imperfection breeds

⁵ There are numerous examples in the literature where MNCs have used their influential status to manipulate the weak institutions for distortional purposes, particularly in Africa and South America.

economic rents. The FDI decisions are then motivated to maximize acquiring these economic rents. These decisions are aggressive, in the sense that the investing firm wants to capture and expand its market, and they are made in consideration with the entire stock of the firm's resources, including capital, technology, management and organization. The second main theory on FDI decisions from the firm's perspective is the product life cycle (PLC) theory developed by Vernon (1966), which asserts that a firm innovates and produces at home first, thanks to the healthy domestic demand, and after meeting the local demand and gaining technological maturity, it starts exporting in response to foreign demand. Subsequently, the firm decides to produce abroad to minimize its costs. The FDI decisions according to the PLC theory are made in a defensive mode, that is, to protect the firm's existing market position. Finally, the third mainstream theory on FDI is the *internalization* theory developed by Buckley and Casson (1976), which states that firms invest abroad when they realize that the benefits of joint ownership of domestic and foreign production will exceed the benefits achieved through trade.

3.2 The Macro-Theory of FDI: Prior to 1960s, there were two dominant neo-classical approaches to theorize the foreign investment decisions: First, the international capital movements are a function of interest rates differentials; Second, the firms invest abroad due to the factor endowments differentials leading to either *absolute* or *comparative* advantages in costs and benefits of production. The workings of these two approaches can be seen in the Heckscher-Ohlin model that represents the neo-classical traditional theory of foreign investment. The earliest work that departs from the Heckscher-Ohlin model came from Grubel (1968), followed by Aliber (1970) and Dunning (1980). Grubel (1968) introduced his *international risk diversification* theory, which states that the capital movement across international borders, either direct or portfolio investment, is not just due to the interest rate differentials, but because these movements are motivated by

positive growth rates of the asset holdings in a recipient country as well as the home country. Grubel (1968) further postulates that foreign investment activity can be observed among two countries where interest rate differentials are either non-existent or negative, while other countries that promise strictly positive interest rate differentials may not see any foreign investment activity. Aliber (1970) brought the foreign currency exchange aspect into the FDI debate. His model is basically an extension of the *international capital movement* theory, with the inclusion of the imperfect competition assumption. Aliber (1970) infers that the firms that have assets denominated in the hard currencies tend to invest abroad in order to take advantage of exchange rate differentials.⁶ Both of these earlier works have had their share of critique, since they both neglect the other more important intangible and non-financial assets affecting the FDI decisions. Dunning (1980) introduced his investment *development cycle* theory, which states that FDI follows a certain development cycle in the recipient country. With the progress in economic development of the recipient country, FDI tends to move from primary sectors to the secondary sectors, and finally to the tertiary sectors. Subsequently the recipient country reaches the development level where it starts exporting FDI.

3.3 The Unified (Micro-Macro) Theory of FDI: Both, micro and macro, theoretical streams of FDI appear to deal with the private or corporate benefits, thus neglecting the social benefits that the governments in recipient countries mostly care about. Some theorists have tried to synthesize the two aspects of FDI into a unified theory. Kojima and Ozawa (1984) present their formal analysis, dubbed as ‘Kojima model’, which asserts that there is a complementarity among FDI and international trade: A country that has a comparative advantage in a given sector is matched up

⁶ The currencies that are stable, and are globally accepted and traded, are called the ‘hard currencies’, such as the US dollar or the Euro, as opposed to the ‘soft currencies’ that are not accepted globally.

with another country that has a comparative disadvantage in the same sector. As a result, this match attracts FDI from the disadvantaged to the advantaged country. The complementarity of FDI and international trade triggers the dynamics of gains for all the parties involved (a win-win situation). The Kojima theory, however, failed to attract a warm reception in the literature. Most of the criticism is directed towards its biased analysis of FDI, where the US FDI is portrayed as anti-trade and Japanese FDI is seen as pro-trade activity. A more balanced view of the unified theory on FDI is presented in Dunning (1993), who has amalgamated the features of the mainstream theories on FDI in a single paradigm called '*the eclectic paradigm*', which is also referred to as the '*OLI paradigm*'. The *eclectic* or the *OLI* paradigm asserts that FDI is a function of OLI advantages that a firm or a country has, where 'O' refers to the ownership advantages, 'L' refers to the location, and 'I' refers to the internalization advantages. After a detailed discussion of '*the eclectic paradigm*', Dunning (1993) concludes that the FDI decisions are made in the search of one or more of the six factors: natural resources, market, efficiency (either products or processes), strategic assets, trade and distribution, and support services.

4. The Determinants of FDI

The preceding section highlighted the various advantages that can affect the FDI decisions and activities.⁷ For the investing firm, these advantages can be summarized as market diversification and growth, economies of scale, organizational control, centralization of research and development (R&D) and market allocation, and geographical asset and risk diversification. For the host country, the advantages can be summed up as natural resources, labor force (raw and skilled), the market size and growth (population and income), the host country's attitude towards foreign investment (tax incentives and property rights), and infrastructure (physical and social). In fact, it is one or

⁷ This is a summary of Table 4.3 in Dunning (1993, p. 84).

more of these advantages that determine the direction of the FDI flows. Considering these various advantages, the list of all FDI determinants would become too long to accommodate here. But since the focus of our study is a country's attractiveness for the inward FDI, we limit our analysis to the country-specific determinants, widely used in the literature, and provide a theoretical justification for the inclusion of the covariates in our econometric model.

4.1 Growth: The potential expansion in the market of a recipient country, and to some extent the region as well, is considered as the most prominent determinant of FDI. A well-documented empirical literature shows a significant positive relationship of this determinant.⁸ In our econometric model, we use per capita GDP growth as a proxy for this determinant.

4.2 Labor Force: The second prominent determinant of FDI, following the growth, is the labor force, both raw and skilled labor.⁹ To gauge this determinant, different studies have used different variables, such as wages, size of the working-age labor force, unemployment rates, education levels, etc. Due to the data-availability constraint for certain countries in our sample, we use the size of the labor force.

4.3 Country's Openness: FDI is often directed at the import-substitution industries (ISI), and the lion-share of FDI goes to the globally traded intermediate and final goods. Therefore, trade openness should have a significant impact on FDI. Additionally, the investors tend to prefer financial openness as well, in the form of minimum barriers to the capital flows. Hence, it is a plausible assumption that the trade and financial openness will have a significant impact on FDI. We use the ratio of imports and exports to GDP as a proxy for the trade openness. As for the financial openness, we use the financial index of Chin and Ito (2006).¹⁰

⁸ For example, Chakrabarti (2001), in his survey of empirical literature on the determinants of FDI, lists 18 studies that show a significantly positive effect of the host-country's market size on the FDI inflows.

⁹ Chakrabarti (2001) lists another 11 studies that find a significant effect of labor cost on the FDI inflows.

¹⁰ See for example, Resmini (2000) who uses both trade and financial openness for that purpose.

4.4 The Currency Stability: Following the Aliber's weak currency hypothesis, numerous empirical studies on FDI have included exchange rate in their econometric model, and have found significant relationship between the two. For example, Edwards (1990) finds a significant and positive impact of a recipient country's exchange rate on the FDI inflows, while Froot and Stein (1991) find the opposite: in their findings, exchange rate has a significantly negative impact on FDI. Our study uses PPP-based exchange rate to proxy for the currency stability.

4.5 Taxation: A decent amount of literature has been devoted to studying the impact of tax rates in the recipient country on FDI. Some find a significant effect of tax rates on the FDI inflows, such as Billington (1999), while others find no such effect, such as Root and Ahmed (1978).

We use the rates of corporate income tax, personal income tax and value added tax.

4.6 Inflation: A stable price level of the recipient country is another important determinant of FDI. A vast majority of the empirical literature on FDI includes a measure of changes in the price level (mainly CPI) and finds a significant negative relationship between the two. Since one of the benefits of inflation targeting is a low and a stable inflation, the IT-adoption should implicitly have a significant positive impact on the FDI inflows. We, therefore, include in our covariate matrix the CPI inflation. Subsequently, we also use an alternative measure of inflation, the GDP deflator, to check for the robustness of our results.

4.7 Governance: In general, the overall quality of governance has been cited by many authors as an important determinant of FDI, particularly since the governance is a catalyst for political stability. We review the literature on the link between governance and FDI in the next section. As for the proxy for governance, there are many different indices available that have been used in the literature. We use as proxy for governance a comprehensive index, an average quality of

governance, which we have constructed as a mean average of the six worldwide governance indicators developed by Kaufmann et al. (2010).

5. Literature Review

The literature on FDI seems to be infinitely large covering numerous aspects from multiple disciplines. However, we limit this section to reviewing the segment of the literature that focuses on establishing a nexus between FDI flows and a recipient country's governance institutions, taxation and monetary policy, particularly inflation targeting.

Hausmann and Fernandez-Arias (2000) investigate whether the quality of the governance institutions in a recipient country plays any role in attracting FDI. In their empirical investigation, they use two sets of indices as proxies for financial development and institutional quality, in addition to utilizing some common macroeconomic aggregates such as income, growth and trade openness. Their findings on financial development are mixed: while the index of creditor rights exhibits an insignificant relationship, the index of shareholder rights has a robust and significant positive effect on the FDI flows.¹¹ As for the quality of governance institutions, their results show a significantly positive coefficient of the index on governance institutions quality with regards to FDI flows.¹² They conclude that a better quality of governance institutions helps in attracting more FDI flows, and the same is also true for other types of foreign investment flows, such as portfolio investment and debt instruments.

Wei and Shleifer (2000) study the effect of corruption (defined as 'poor public governance') and macroeconomic policies on three types of foreign investment flows, FDI, FPI and foreign bank

¹¹ These two indices were developed by La Porta et al. (1997).

¹² For governance quality, they construct an index using an average of Kaufman's indices (regulatory burden, accountability, government effectiveness, graft, rule of law).

loans. Using a sample of 93 countries (including 20 OECD and 73 non-OECD countries) for the years 1980 to 1996, they find that corruption has significant but opposite impacts on foreign investment flows into a recipient country: it significantly reduces FDI flows, but at the same time it has a positive effect on foreign bank loans and FPI. More importantly, when they introduce macroeconomic policies in their control matrix, corruption tends to have an even worse effect on FDI, an effect which is statistically significant and quantitatively large.

Habib and Zurawicki (2002) study the impact of absolute difference in corruption levels between the home and the host (recipient) country on the FDI inflows in a recipient country. In addition to the common aggregate variables, they utilize the corruption perception index – developed by Transparency International – and an absolute difference of this index between the home and the host country to estimate the FDI inflows in a large sample of 89 countries over a three-year period. They find a significant negative effect of both corruption and the absolute difference in corruption between the home and the host country on FDI inflows.

Globerman and Shapiro (2003) investigate the importance of governance infrastructure in attracting the FDI flows from the US. Their sample includes 143 countries (of which 88 are the recipients of the US FDI flows) over a three-year period from 1995 to 1997. Their control variables include, in addition to a matrix of traditional macroeconomic aggregates, the governance indicators and a dummy variable for the legal system – English common law. Their findings indicate a significant positive effect of the governance infrastructure on attracting the US FDI inflows. The authors conclude that English common law practice, open markets, government effectiveness and accountability are important determinants of the US FDI flows.

Grosse and Trevino (2005) conduct an empirical investigation of FDI inflows in the transitional central and eastern European economies employing a neo-institutional economics approach to testing whether FDI flows react to changes in governance institutions in these economies. Using a panel data set comprising 13 central and eastern European countries over a 10-year period, they estimate the effects of institutional quality and public policies on FDI inflows into these economies. In their regressions, they use both traditional factors, such as macroeconomic variables, and non-traditional factors, such as political and environmental factors. Their findings, in line with the literature, show that corruption constrains FDI inflows in their sample countries via increased costs for the investors in order to mitigate potential risks.

Li (2006) studies the relationship between tax incentives and rule of law in a recipient country on the FDI flows. He first develops a theoretical model and then empirically tests the validity of his model on a sample of 52 developing countries (excluding advanced countries) in the year 2001. His results show a significant negative coefficient of the rule of law index, implying that countries with better quality of rule of law offer low or no tax incentives to attract FDI flows compared to those who have inferior quality of rule of law.¹³ This negative effect seems to be even stronger in countries where democracy is practised to elect governments.

Pajunen (2008) looks at the complex and diverse causal relationships between institutions in a recipient country and the FDI of multinational corporations (MNCs). Applying a fuzzy-set analysis approach to a sample of 47 countries between the year 1999 and 2003, he analyzes the effects of institutional quality on attracting FDI.¹⁴ His findings suggest that the institutions seem to exert a

¹³ Li (2006) employs the year-2000 index for the rule of law.

¹⁴ Pajunen (2008) uses the UNCTAD's index for the inward FDI performance and assigns the fuzzy-set score to a country based on its overall share of the global FDI flows as a ratio of its share of the global GDP.

diverse influence over FDI flows in different countries. One cannot pinpoint a particular institution as having a certain relationship with FDI flows. An institution may exhibit a totally opposite and significant influence on FDI in two different countries implying that there must be other factors – such as geopolitical factors – that also play an important role in affecting FDI flows. However, in their inclusivity, institutions do play a significant role in attracting FDI flows into a recipient country. As opposed to the mainstream perception, Pajunen’s findings assert that corruption and lack of property rights do not always appear to be the sufficient institutional obstacles to FDI flows.

Guerin and Manzocchi (2009) study the political regime effect on FDI flows in emerging economies coming from the advanced economies. With a country sample of 38 countries (14 advanced and 24 emerging) they apply a ‘gravity model’ to estimate the impact of the type of political regime – in addition to a matrix of aggregates – on the FDI inflows. They find that democracy affects in a significantly positive manner the FDI inflows from advanced to emerging economies.¹⁵ Moreover, democracy based on a parliamentary system is likely to attract more FDI inflows than the presidential system.

Goodspeed et al. (2010) compare the effects of government policies on the stock of FDI in advanced and developing recipient countries. The government policies include not only governance (proxied by the corruption perception index from Transparency International) and taxation (proxied by the tax rate), but they also cover the infrastructure – basic physical infrastructure, technological infrastructure and energy/environment infrastructure – proxied by a country’s infrastructure ranking in the World Development Indicators (WDI). They employ a panel sample of 53 countries (28 of them are developed and 25 developing) over a 19-year period from

¹⁵ Their regime dummy is based on the index ‘Polity 2’ from the Polity VI Project of the University of Maryland.

1984 to 2002. However, since data on all the indices for these 53 countries are not available, they limit their empirical exercise to those countries that have data available for all the variables. Their findings present a dichotomy in terms of FDI stocks: the results show a significant negative relationship between FDI stocks on one hand and the tax rate and the corruption level on the other hand, implying that countries with a low tax rate and low corruption have a larger FDI stock compared to countries that have higher tax rates and corruption. As for the infrastructure, the results appear to show a significant positive relationship with FDI stocks: countries with better infrastructure quality, mostly developed countries, tend to have a larger FDI stock than those with an inferior infrastructure, mainly the developing countries.

Finally, Nasir and Hassan (2011) explore the expected role played by governance institutions, macroeconomic policies and the overall market size of a recipient country in attracting FDI. Using a panel sample comprising four South Asian countries (India, Pakistan, Bangladesh and Sri Lanka) for the years 1995-2008, they investigate the effects of institutions (proxied by the Economic Freedom index), macroeconomic stabilizing policies (proxied by the real exchange-rate regime) and market size (proxied by GDP).¹⁶ Their findings suggest a positive impact of institutional quality and market size on attracting FDI. As for the real exchange rate, currency depreciation appears to have a negative effect on the FDI inflows.

5.1 Monetary Policy, Inflation Targeting and FDI

We first describe below the various channels that monetary policy has access to, regardless of the framework that it adheres to. Next, we examine the possible linkages or impacts of these channels on FDI, and subsequently we review some of the literature on ITR and FDI.

¹⁶ This index is developed by the Heritage Foundation and is constructed from a set of measures such as business environment, trade policy and other macroeconomic policies, fiscal and monetary policy.

Among the several channels through which monetary policy can operate and transmit its objectives, six major channels are distinguished by the literature as providing a transmission mechanism for monetary-policy operations:¹⁷

(i) The traditional interest rate channel: When a central bank announces a change in its key lending nominal interest rate, this announced change transmits the central bank's objective to the real interest rates thus affecting the overall cost of capital in the economy. Households and firms react to this change, and make their consumption and investment decisions accordingly.

(ii) The wealth channel: A change in the interest rates can have a direct impact on asset prices, both real and financial assets, leading to altering the wealth-related expectations, which act as a catalyst for transmitting the policy objectives to the decisions over consumption and investment.

(iii) The broad credit channel: Since households and firms often use their assets as collateral, changes in asset prices can also affect their consumption and investment decisions.¹⁸

(iv) The bank lending channel (the narrow credit channel): Monetary policy can affect credit availability through domestic commercial banks, assuming reserve requirements are in place.

(v) The exchange rate channel: Assuming the uncovered interest rate parity (UIP), the changes in the domestic interest rates can affect the expected movements in exchange rate.

(vi) The monetarist channel: Assuming the imperfect asset substitutability, monetary policy can affect the outstanding asset values that will translate into relative asset prices. The interest rate is just one of the many relative prices, according to the proponents of this channel, the monetarists.

¹⁷ This is a summary of an in-depth analysis of these channels in Kuttner and Mosser (2002).

¹⁸ This channel is linked to the wealth channel, and the impact on consumption and investment through this channel is also referred to as '*financial accelerator*' effect.

The transmission mechanism comprising the aforementioned channels seems to work essentially for the domestic economy. It is a complex task to disentangle these channels and study the specific effects on the decisions of the domestic consumers and the investors.¹⁹ However, for the analysis of FDI, it may seem implausible to look at these channels in their globality. Some of the channels may not affect foreign investors at all, particularly those with 100% foreign funding and those who do not intend to finance partially via the recipient country's financial markets.

Under the assumption of 100% foreign funding, the narrow and broad credit channels are likely to be irrelevant, but the remaining four channels can impact the investment decisions. However, the 100% foreign funding for FDI may not hold ground since most FDI ventures seek financing through the domestic financial markets along with their foreign funding resources. Hence, almost all channels seem to be relevant for FDI, perhaps with a different level of each channel's impact.

As for the link between ITR and FDI, one factor that seems to bond the two together is macroeconomic stability in a recipient country. Proponents of inflation targeting passionately argue that ITR mitigates uncertainty and brings overall macroeconomic stability to the adopting country. For example, Svensson (1997) credits ITR for enabling the public and the markets to evaluate the credibility of policymakers and hold them accountable for their commitments. In addition, Bernanke et al. (1999) admire ITR for its explicitly defined objectives, greater transparency, and enhanced accountability due to the fact that the general public is periodically briefed about the policy objectives. They also credit ITR for mitigating the 'pass through' effects of unexpected shocks and keeping the nominal interest rates stable. Mishkin (1999) credits ITR for obliging the policymakers to increase the level of transparency by openly communicating with

¹⁹ Kuttner and Mosser (2002).

the general public and the markets regarding policymakers' objectives. Mishkin also adds to ITR the enhanced level of accountability of policymakers' announced objectives.

Several other benefits have been also attributed to the inflation-targeting regime: ITR rejuvenates the motivations for institutional reforms; ITR reduces uncertainty and the confusion over the policy stance; ITR builds and lends credibility to the policymakers; and ITR has '*state of the art*' nature, which helps in combating the prevailing uncertainty in the economy and enhances macroeconomic stability.²⁰

In light of the benefits stated above, the IT-adoption should favor and attract more FDI.

As for the impact of ITR on FDI, there are a handful of studies on the topic, perhaps because inflation targeting is considered to be an inward-looking policy framework. A summary of these studies follows, which portrays the nexus among foreign investment, the governance institutions, and macroeconomic policies, particularly monetary policy in the form of inflation targeting.

Kopits (2001) provides an early analysis of the important role played by the government institutions in the success or failure of macroeconomic policies. He first analyzes the fiscal reforms adopted by advanced and emerging economies to lend credibility to their fiscal policy regime, and then compares these reforms to those necessary for the adoption of an inflation-targeting regime. He suggests that the recent fiscal rules can serve as a useful policy framework, particularly for countries that lack credibility and wish to adopt the inflation-targeting regime.

Blanchard (2004) develops a theoretical model on a macroeconomic proposition which states that changes in the real interest rates induced by a monetary policy stance trigger similar movements

²⁰ See for example, Schaechter et al. (2000), Gavin (2003), Truman (2003) and Hammond (2012).

in the real exchange rates. These movements imply that an increase (decrease) in the real interest rate will lead to an increase (decrease) – a real appreciation (depreciation) – in the domestic currency's value against other currencies in the foreign exchange (forex) markets. His model is formulated on an interaction between the interest rate and the exchange rate – the two of the six channels of monetary policy transmission mechanism – and a country's default probability. The model predicts that an increase in the interest rate – under a contractionary monetary policy – will lead to an increase in the probability of default. This effect becomes even stronger when the initial level of debt is assumed to be higher.

Blanchard (2004) also puts his model to an empirical test using Brazil as a case study (Brazil has been an inflation-targeting country since 1999). His sample comprises monthly observations of Brazilian C-bonds (with the credit ratings of Baa) and a difference (spread) between Brazilian T-bonds and the US Treasury bonds of similar credit ratings over a time period of February 1995 to January 2004. His main quest, apart from testing the validity of his own model, is to investigate empirically how a country's debt level and composition – coupled with the global risk-aversion phenomenon – react to a contractionary monetary policy of an ITR country like Brazil. He finds that the two channels affect the domestic inflation rate perversely as opposed to what policymakers would believe or expect to realize. He concludes that under adverse fiscal conditions, the traditional macroeconomic proposition will not hold ground: an increase in the interest rate under a contractionary monetary policy is more likely to have a negative effect on real exchange rates and will result in fueling inflation instead of containing it.²¹

²¹ Blanchard (2004) states symptoms of these conditions as in Brazil: a higher level of debt, denomination of a larger proportion of this debt in foreign currency and an unusually higher risk aversion of foreign investors.

Prasertnukul et al. (2010) study the exchange rate channel and its effectiveness in terms of the real exchange rate volatility and the pass-through to the domestic price level under an inflation-targeting regime. Their panel sample includes four Asian countries that adopted the ITR, namely Indonesia, South Korea, the Philippines and Thailand. Using monthly observations covering January 1990 to June 2007, they investigate the impact of the IT-adoption on the variability of the real exchange rate as well as the pass-through from the exchange rate to the price level in the domestic markets. Their results suggest that generally inflation targeting has helped all four countries to reduce exchange-rate variability. As for the exchange-rate pass-through to the domestic price level, their findings indicate a significant reduction of pass-through in South Korea and Thailand, but insignificant results in the case of Indonesia and the Philippines.

Combes et al. (2012) study the possible interaction between the fiscal-rule regime and the inflation-targeting regime and their combined effects on changes in the price level and the fiscal health of an economy. They do so by first exploring joint and isolated effects of the two regimes, and then investigating the possible role played by the time or sequence of the regime adoption. Using a System-GMM estimation methodology on a large sample of 152 countries over a 20-year period from 1990 to 2009, they find interactive and complementary effects of the two regimes on the price level and the fiscal balance in the sample countries.

Finally, Tapsoba (2012), which is the closest to our study, investigates the impact of the inflation-targeting adoption on attracting FDI. His sample includes 53 developing countries over a 28-year period (1980-2007). Employing the treatment effects methodology, he finds a significant positive

impact of the IT-adoption on attracting FDI inflows. His results show that the IT-adoption in developing countries has increased the FDI inflows by 2 percentage points.²²

Interestingly, as explained in the next section, we also get the same results for our grand sample, but once we use clustering method, the results turn out to be different!

6. Empirics

6.1 Data: We use panel data with the annual time series covering 90 countries over a period of 18 years from 1996 to 2013.²³ The sample is further clustered into two sub-samples: the OECD sample, which includes 34 OECD member countries: 16 of them have adopted inflation-targeting regime, while the remaining 18 countries are non-IT adopters.²⁴ According to the latest World Bank's classification, the OECD countries are classified as high income countries (HICs) except for three of them – Hungary, Mexico and Turkey – which are classified as middle income countries (MICs).²⁵ Our second clustered sample contains 59 MICs: 17 have adopted ITR thus far, and the remaining 42 MICs are non-IT adopters.²⁶

For our MIC sample, the income-based grouping is plausible because the development-based grouping often ignores the income-level differences. This clearly violates the assumption of 'selection on observables' (also referred to as imbalance in observed confounders).

²² This positive effect of IT-adoption on FDI inflows is apparently due to the study's inclusive sample of both rich and poor economies under the label of 'developing countries'.

²³ See appendix 'A' for a complete list of all the 90 countries in our sample.

²⁴ Two of these 18 countries, Finland and Spain, had initially adopted ITR but soon abandoned it after joining the European Union, so they are considered as non-IT countries in our sample.

²⁵ We also perform robustness checks by excluding these three countries from the OECD and MICs samples.

²⁶ Three countries – Hungary, Mexico and Turkey – appear in both samples, because they are middle-income countries, and at the same time they are also OECD member countries. To enhance the quality of our analysis, we restrict our sample on MICs to 59 countries after dropping those that have too many missing observations or those classified by the World Bank as small states (SST) or fragile and conflict-affected states (FCS).

More importantly, this study also includes in its covariate matrix an index of the worldwide governance indicators. Since the quality of governance institutions plays a key role in the outcome of any policy implementation, the inclusion of a proxy for such quality would satisfy the often violated assumption of ‘selection on non-observables’ (imbalance due to non-observed confounders, such as institutional quality). The major sources of the data are the World Bank’s world development indicators (WDI), the worldwide governance indicators (WGI), the international financial statistics (IFS) and the world economic outlook (WEO) of the International Monetary Fund (IMF).²⁷ Data on some aggregates were also downloaded from the Heston et al. (2012). We use a comprehensive dataset that includes, in addition to the normal macro variables, the worldwide governance indicators, the latest data on personal and corporate income tax rates and value added tax rate provided by the IMF’s Fiscal Affairs Department. We also use the Chinn and Ito (2006) index to proxy for financial openness. We use two time horizons: the inclusive time horizon of an 18-year period from 1996 to 2013, and a truncated time horizon of a 13-year period from 2001 to 2013. The justification for this truncation is two-fold: First, the vast majority of MICs joined the ITR club at the beginning of 21st century. Second, during the 1990s, a number of financial crises must have had some impact on the FDI inflows to some of our sample countries. So the time stratification enables us to check for any bias stemming from the impact of these crises.²⁸ An important feature of these crises was that they were specific to a country or a region, as opposed to a global crisis, such as the financial crisis of 2009, which was not specific to a certain country or a region, but it engulfed the entire world.

²⁷ These indicators were initially developed by Kaufmann et al. (2010). For further details on the data sources, aggregation methodology and definitions, visit: www.govindicators.org.

²⁸ Three of these crises are the Mexican financial crisis of 1994 (‘Tequila crisis’), the Asian financial crisis in 1997-98 (‘Asian flu’) and the Russian financial crisis in 1998 (‘Russian virus’).

Table (1) The Variables with the Definitions

Variable	Description	Source
Inflation Targeting Regime (ITR)	Binary variable used as dummy for inflation targeting, equals 1 for the years when a country has had ITR in place, and 0 otherwise.	Gemayel et al. (2011), Roger (2009) and the websites of various central banks and the IMF.
FDI Inflows	Foreign direct investment net inflows (as % of GDP).	IMF, IFS and Balance of Payments, World Bank and OECD, International Debt Statistics, and GDP estimates.
CPI Inflation	Annual percentage change in the consumer price index (using Laspeyres method).	World Development Indicators, The World Bank (Last Updated: 03/12/2015).
Output Growth	Annual growth rate of GDP at market prices based on constant 2005 U.S. dollars.	World Bank national accounts data, and OECD National Accounts data files.
Work Force	The total population aged 15-64 (% of total population, ILO estimates).	The United Nations Population Division's World Population Prospects.
Financial Openness	The Chinn and Ito (2006) index for the openness in capital accounts transactions.	Chinn and Ito (2006).
PPP Exchange Rate	Price level ratio of PPP conversion factor (GDP) to market exchange rate.	World Bank, International Comparison Program database.
Trade Openness	Total exports and imports as a % of GDP.	World Bank/OECD National Accounts.
Corporate Income Tax	The percentage rate of corporate income tax officially reported to the IMF.	International Monetary Fund, Fiscal Affairs Department database.
Personal Income Tax	The percentage rate of personal income tax reported to the IMF.	International Monetary Fund, Fiscal Affairs Department database.
Value Added Tax	Tax rate on goods and services (% value added of industry and services) reported to the IMF.	International Monetary Fund, Fiscal Affairs Department database.
GDP Deflator	Annual growth rate of the GDP implicit deflator.	World Bank/OECD National Accounts.

6.2 Methodology: This study employs the treatment-effects matching estimation. We use various categories of two matching estimators: the propensity-score matching (PSM) and the nearest-neighbour matching (NNM). For the PSM, we use both the ‘single match’ and the ‘multiple matches’ and for the NNM we apply a ‘narrow’ radius and a ‘wide’ radius.²⁹ Finally, we test the

²⁹ PSM and NNM are two measurement methods that check for identical or near-identical observations: the PSM estimates predict the probability of a country adopting ITR given its covariates (propensity score), while the NNM estimates the distance among two near-identical observations. For more on this, see Rosenbaum (2002).

robustness of these estimators by applying a large sample bias correction estimation and a regression adjustment through inverse-probability weighting (IPW).

Moreover, two additional robustness checks are also performed: First, the sample-related robustness checks are performed, such as the exclusion of outlier observations, using an alternative specification of inflation, and truncating the sample's time horizon to account for abnormal shocks. Second, and more importantly, the data-related and the methodology-related robustness checks are performed, such as the post-estimation tests. In this vein, we test for the unobserved heterogeneity using the Rosenbaum sensitivity analysis tests and we check for the satisfaction of the two key assumptions: the overlap assumption and the common support assumption. The results for all the tests are given in the Appendix.

7. Results

In the following, we analyze our empirical results for our inclusive sample, as well as for the clustered samples, the OECD and the MICs samples, separately.³⁰

7.1 The Grand Sample : The results in Table (2) for the grand sample paint an encouraging picture for the IT-adoption. The coefficients for the inclusive sample (the first row) are all significant at the 90% confidence level. IT-adoption appears to have helped the adopters increase the FDI inflows by about two to three percentage points as compared to the non-adopters. These results remain about the same when we drop the outlier observations where the CPI inflation is higher than 100%, 50% and 25%. However, the coefficients for the truncated sample – rows 5 to 8 – show even a better performance: the IT-adoption has helped the adopting countries increase the FDI inflows by about 3 ½ percentage points more than their counterparts, the non-adopting countries.

³⁰ As for the likelihood of IT adoption results based on a probit model, see appendix, tables 6.1, 6.2 and 6.3.

The results imply that the inflation-targeting adoption helps the adopting countries attract more FDI, because as claimed by the IT-proponents that inflation targeting mitigates uncertainty and enhances macroeconomic stability, thus creating an environment that is conducive to FDI. But without further investigation, these results may be misleading because the sample has both high-income and middle-income countries grouped together. Given that our country sample includes the OECD countries – that are mainly high-income countries – and the middle-income countries (MICs), we therefore cluster our grand sample into two subsamples: the OECD and the MICs.

Table (2) The Treatment Effects (ATET) on FDI Inflows for the Grand Sample

		Propensity Score Matching (PSM)		Nearest Neighbor Matching (NNM)		Regression Adjustment	
Model ↓	Estimator →	Single Match	Multiple Matches	Narrow Radius	Wide Radius	Sample Bias Adj.	Reg. Adjustment
		Inclusive Sample	.0294* (.0157)	.0286* (.0156)	.0253* (.0157)	.0244 (.0157)	.0268* (.0158)
	Dropping CPI > 100 %	.0294* (.0157)	.0286* (.0156)	.0260* (.0158)	.0245 (.0157)	.0261* (.0158)	.0275* (.0160)
	Dropping CPI > 50 %	.0274* (.0158)	.0274* (.0158)	.0264* (.0157)	.0250 (.0157)	.0270* (.0157)	.0275* (.0160)
	Dropping CPI > 25 %	.0269* (.0159)	.0273* (.0157)	.0264* (.0158)	.0250 (.0157)	.0262* (.0158)	.0275* (.0160)
	Truncated Sample	.0345* (.0188)	.0296* (.0174)	.0316* (.0171)	.0297* (.0171)	.0314* (.0171)	.0339** (.0176)
	Dropping CPI > 100 %	.0345* (.0188)	.0296* (.0174)	.0316* (.0171)	.0297* (.0171)	.0314* (.0171)	.0339** (.0176)
	Dropping CPI > 50 %	.0351* (.0186)	.0319* (.0174)	.0313* (.0171)	.0291* (.0171)	.0307* (.0172)	.0342** (.0176)
	Dropping CPI > 25 %	.0352** (.0186)	.0299* (.0175)	.0313* (.0171)	.0295* (.0171)	.0307* (.0172)	.0343** (.0176)

The Coefficients are for FDI Inflows (Outcome Dependent Variable). The Independent Variables are CPI inflation, Output Growth, Financial Openness, Trade, PPP Exchange Rate, CIT, PIT, VAT and an index for the Overall Institutional Quality. Treatment Variable is Inflation Targeting Regime (ITR) Dummy.

Note: The asterisks next to the coefficients (*, **, ***) represent their significance levels of 10%, 5%, and 1% respectively. Figures listed in parenthesis are Robust Standard Errors. Also note that the ‘Inclusive Sample’ covers 18 years from 1996-2013 while the ‘Truncated Sample’ covers 13 years from 2001-2013.

7.2 The OECD Sample: Table (3) below presents the treatment effects of IT-adoption on attracting FDI inflows for our OECD sample.

All the coefficients are positive and a vast majority of them are significant, implying that the OECD countries that adopted ITR have outperformed their counterparts in attracting FDI over the sample period: an increase in the FDI inflows by 3 ½ to 4 ½ percentage points more compared to the non-IT OECD countries during the same time period.

Table (3) The Treatment Effects (ATET) on FDI Inflows for the OECD Sample

		Propensity Score Matching (PSM)		Nearest Neighbor Matching (NNM)		Regression Adjustment	
Model ↓	Estimator →	Single Match	Multi Matches	Narrow Radius	Wide Radius	Sample Bias Adj.	Reg. Adjustment
Inclusive Sample		.0350* (.0212)	.0346* (.0211)	.0358* (.0209)	.0350* (.0207)	.0376* (.0212)	.0479* (.0253)
No CPI > 100 %		.0350* (.0212)	.0346* (.0211)	.0358* (.0209)	.0350* (.0207)	.0376* (.0212)	.0479* (.0253)
No CPI > 50 %		.0354* (.0212)	.0347* (.0211)	.0363* (.0208)	.0318 (.0209)	.0377* (.0211)	.0479* (.0253)
No MICs Members		.0301 (.0241)	.0319 (.0241)	.0381 (.0242)	.0393* (.0242)	.0403* (.0245)	.0534** (.0276)
Truncated Sample		.0415* (.0251)	.0334 (.0248)	.0448* (.0239)	.0398* (.0239)	.0344 (.0240)	.0609** (.0291)
No CPI > 100 %		.0415* (.0251)	.0334 (.0248)	.0448* (.0239)	.0398* (.0239)	.0344 (.0240)	.0609** (.0291)
No CPI > 50 %		.0375 (.0252)	.0339 (.0249)	.0445* (.0239)	.0402* (.0239)	.0277 (.0240)	.0609** (.0291)
No MICs Members		.0205 (.0293)	.0293 (.0288)	.0476* (.0287)	.0474* (.0287)	.0363 (.0288)	.0646** (.0323)

The Coefficients are for FDI Inflows (Outcome Dependent Variable). Independent variables are CPI inflation, Output Growth, Financial Openness, PPP Exchange Rate, Trade, Labor Force, CIT, PIT, VAT and Average Quality (an index for Institutional Quality). Treatment Variable is Inflation Targeting (ITR) Dummy.

Asterisks next to the coefficients (*, **, ***) represent significance levels of 10%, 5%, and 1% respectively. Figures listed in parenthesis are Robust Standard Errors. The 'Inclusive Sample' covers 18 years (1996-2013) and the 'Truncated Sample' covers 13 years (2001-2013).

7.3 The MICs Sample: Table (4) below presents the treatment effects of IT-adoption among MICs on attracting FDI. One clear contrast seen here is the negative sign attached to all the coefficients across the various estimators as opposed to what we observed earlier in Table (2). In the inclusive

sample (rows 1 to 4), we notice that IT-adoption has had an adverse impact on the FDI inflows among the MICs: the FDI inflows have decreased by about 2 to 3 percentage points among the IT-adopting MICs compared to the non-adopting MICs. This adverse effect is consistent across different model specifications though losing statistical significance at times.

Table (4) The Treatment Effects (ATET) on FDI Inflows for the MIC Sample

Model ↓	Estimator →	Propensity Score Matching (PSM)		Nearest Neighbor Matching (NNM)		Regression Adjustment	
		Single Match	Multi Matches	Narrow Radius	Wide Radius	Sample Bias Adj.	Reg. Adjustment
Inclusive Sample		-.0278** (.0132)	-.0180* (.0102)	-.0232* (.0135)	-.0239** (.0114)	-.0233** (.0118)	-.0152* (.0090)
No CPI > 100 %		-.0278** (.0132)	-.0180* (.0102)	-.0214 (.0156)	-.0267** (.0124)	-.0236* (.0127)	-.0189** (.0094)
No CPI > 50 %		-.0200* (.0117)	-.0145 (.0103)	-.0252* (.0153)	-.0290** (.0125)	-.0318*** (.0126)	-.0183** (.0092)
No OECD Members		-.0073 (.0095)	-.0098 (.0083)	-.0236 (.0162)	-.0257* (.0141)	-.0450*** (.0142)	-.0080 (.0074)
Truncated Sample		-.0319* (.0184)	-.0153 (.0111)	-.0057 (.0141)	-.0085 (.0096)	-.0161* (.0096)	-.0103 (.0090)
No CPI > 100 %		-.0319* (.0184)	-.0153 (.0111)	-.0057 (.0141)	-.0085 (.0096)	-.0161* (.0096)	-.0103 (.0090)
No CPI > 50 %		-.0335** (.0171)	-.0147 (.0097)	-.0041 (.0140)	-.0068 (.0098)	-.0148 (.0098)	-.0094 (.0089)
No OECD Members		-.0021 (.0079)	-.0052 (.0074)	-.0068 (.0102)	-.0033 (.0097)	-.0223** (.0107)	-.0058 (.0064)

The Coefficients are for FDI Inflows (Outcome Dependent Variable). Independent variables are CPI inflation, Output Growth, Financial Openness, PPP Exchange Rate, Trade, Labor Force, CIT, VAT and Average Quality (an index for Institutional Quality). Treatment Variable is Inflation Targeting Regime (ITR) Dummy.

Asterisks next to the coefficients (*, **, ***) represent significance levels of 10%, 5%, and 1% respectively. Figures listed in parenthesis are Robust Standard Errors. Note that 'Inclusive Sample' covers 18 years (1996-2013) while 'Truncated Sample' covers 13 years (2001-2013).

7.4 Robustness Checks: The results presented in the previous two subsections seem robust to various model specifications as well as the exclusion of outlier observations. However, we have performed some additional robustness checks as follows:

Table (5) Robust Treatment Effects (ATET) on FDI Inflows for the MICs Sample

		Propensity Score Matching (PSM)		Nearest Neighbor Matching (NNM)		Regression Adjustment	
Model ↓	Estimator →	Single Match	Multi Matches	Narrow Radius	Wide Radius	Sample Bias Adj.	Reg. Adjustment
Inclusive Sample		-0.0049 (.0068)	-0.0066 (.0078)	-0.0246* (.0138)	-0.0249** (.0114)	-0.0242** (.0117)	-0.0151* (.0090)
No Deflator > 50 %		-0.0006 (.0061)	-0.0011 (.0056)	-0.0220 (.0151)	-0.0260** (.0122)	-0.0237** (.0123)	-0.0182** (.0094)
No OECD Members		-0.0121 (.0124)	-0.0102 (.0099)	-0.0238 (.0161)	-0.0250* (.0141)	-0.0323** (.0142)	-0.0079 (.0075)
Truncated Sample		-0.0149 (.0108)	-0.0093 (.0093)	-0.0054 (.0142)	-0.0053 (.0096)	-0.0122 (.0097)	-0.0085 (.0089)
No OECD Members		-0.0149 (.0108)	-0.0126 (.0105)	-0.0054 (.0142)	-0.0053 (.0096)	-0.0122 (.0097)	-0.0085 (.0089)

The Coefficients are for FDI Inflows (Outcome Dep. Variable). The Independent Variables are GDP Deflator, Output Growth, Financial Openness, PPP Exchange Rate, Unemployment, Trade, Labor Force, CIT, VAT and Average Quality (an index for the Overall Institutional Quality). Treatment Variable is Inflation Targeting (ITR) Dummy.

The asterisks next to the coefficients (*, **, ***) represent the significance levels: 10%, 5%, and 1% respectively. Figures listed in parenthesis are Robust Standard Errors. The 'Inclusive Sample' covers 18 years (1996-2013) and 'Truncated Sample' covers 13 years (2001-2013).

Table (6) Robust Treatment Effects (ATET) on FDI Inflows for the OECD Sample

		Propensity Score Matching (PSM)		Nearest Neighbor Matching (NNM)		Regression Adjustment	
Model ↓	Estimator →	Single Match	Multi Matches	Narrow Radius	Wide Radius	Sample Bias Adj.	Reg. Adjustment
Inclusive Sample		.0205 (.0211)	.0225 (.0207)	.0260 (.0214)	.0244 (.0214)	.0281 (.0214)	.0318 (.0211)
No Deflator > 50 %		.0155 (.0212)	.0215 (.0208)	.0250 (.0214)	.0211 (.0215)	.0258 (.0215)	.0319 (.0212)
No MICs Members		.0288 (.0245)	.0341 (.0242)	.0342 (.0244)	.0355 (.0243)	.0346 (.0244)	.0396* (.0247)
Truncated Sample		.0331 (.0271)	.0331 (.0268)	.0403* (.0244)	.0372 (.0246)	.0260 (.0245)	.0464* (.0257)
No MICs Members		.0215 (.0296)	.0273 (.0292)	.0463 (.0289)	.0463* (.0287)	.0334 (.0286)	.0602** (.0298)

The Coefficients are for FDI Inflows (Outcome Dependent Variable). Independent Variables are GDP Deflator, Output Growth, Financial Openness, PPP Exchange Rate, Unemployment, Trade Openness, Labor Force, CIT, PIT, VAT and Ave. Quality (an index for Institutional Quality). Treatment Variable is Inflation Targeting (ITR) Dummy.

Asterisks next to the coefficients (*, **, ***) represent significance levels of 10%, 5%, and 1% respectively. Figures listed in parenthesis are Robust Standard Errors. Note that 'Inclusive Sample' covers 18 years (1996-2013) and 'Truncated Sample' covers 13 years (2001-2013).

First, we employ the GDP deflator as an alternative to the CPI inflation as recommended by the IMF.³¹ The results are presented in Tables (5) and (6). The results for the treatment effects of ITR adoption on attracting the FDI inflows – when the GDP deflator is considered as a measurement for inflation – paint an interesting picture: despite the vast majority of the coefficients lacking statistical significance, the signs and magnitudes of these coefficients exactly resemble those in Tables (3) and (4).

Second, we drop the two outlier countries, China and India, from our control group, and find that the results are unaffected by their exclusion.

Our findings therefore seem to be robust to using GDP deflator as an alternative to CPI inflation, as well as to excluding China and India from the control group.

Third, we check whether our samples satisfy the following two key assumptions:

(i) The conditional independence assumption (CIA), also known as un-confoundedness assumption or selection on observables, which states that once we control for all the variables in our covariate matrix for sample countries, the potential outcome, for both the treated and the non-treated, becomes independent of whether a country adopted ITR or not.

Formally this can be written as: $(Y^1, Y^0) \perp T \mid X$

(ii) The overlap assumption, also known as the common support assumption: this assumption requires that our covariate matrix contains observations that can be matched with a strictly positive probability in both the treated and control groups.

Formally this can be written as: $0 < \text{prob.}(T=1 \mid X) < 1$.

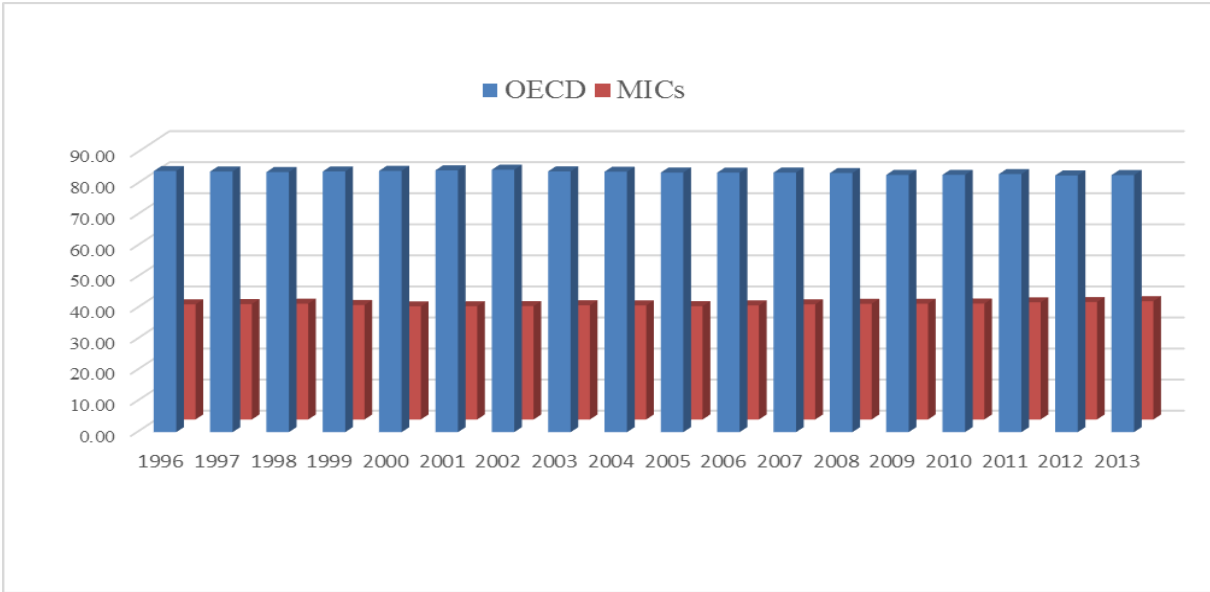
³¹ CPI measures the cost of a standard basket of consumer goods and services, including the imported goods and services. Whereas, GDP deflator measures the price level of all the final goods and services produced domestically. See Schaechter et al. (2000) and for further details on this.

The figures are displayed in the Appendix, which confirm the satisfaction of these assumptions in both of our sub-samples, the OECD sample and the MICs sample.

Finally, we verify that our results are not sensitive to the unobserved heterogeneity due to the fact that countries in our sample do exhibit heterogeneity. To do so, we utilize the Rosenbaum Bounds sensitivity test developed by Rosenbaum (2002). Table (7) below presents the results for the Rosenbaum sensitivity tests showing the upper and lower bounds which are all significant at 5% and 10% confidence intervals. Note that the ‘gamma’ here represents a threshold for the outcome being affected by the unobserved heterogeneous factors in the sample. In other words, when gamma is 3, the odds ratios of the results being affected by the hidden bias due to heterogeneity are 1 to 3 (200% more). In social sciences, a value of 2 for the ‘gamma’ is reasonable, implying a doubling of the odds; however, we have applied a value of 3 for ‘gamma’.

There is no hidden bias due to the unobserved heterogeneous factors in our samples.³²

Figure (1) The Average Institutional Quality (The Mean Average of the Six WGI)



³² See Rosenbaum (2002) for a detailed analysis of these sensitivity tests.

broader sample confirms that IT-adoption has helped the adopting countries increase the FDI inflows by about 3 percentage points as compared to the non-IT adopters. However, a closer look reveals these findings to be misleading when we cluster our sample into two by separating high-income countries from the middle-income countries. Surprisingly, the results for our clustered samples exhibit a contradicting pattern. Among the high-income countries, the results are in favor of the IT-adoption: the IT-adopting OECD countries have enjoyed a significant increase in the FDI inflows by about 3 ½ to 4 ½ percentage points compared to the non-IT OECD countries. Whereas, among the middle-income countries, the results paint a grim picture of the IT-adoption: the MICs that adopted inflation targeting have suffered a significant reduction in the FDI inflows by about 2 to 3 percentage points as compared to the non-IT adopting MICs. One suspect behind the contradictory outcomes of the same policy regime may be the fact that the MICs simply do not have the quality institutional settings needed to successfully implement inflation targeting, which might have helped their richer counterparts, the OECD group, in reaping the benefits of inflation targeting. Figure (1) in the above section lends support to this suspicion.

However, given that the results are obtained from panel regressions – which are known for imperfections – caution must prevail when interpreting these results. Perhaps, a case-study approach to further verify our findings should enable us to have a clear verdict on the effectiveness of inflation targeting in attracting or distracting FDI.

Nevertheless, the results do vindicate the stance of those who negate the ‘*one-size-fits-all*’ approach, and advocate for the provision of good quality institutions prior to IT-adoption.

8. References

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Appendix

Table (8) The Grand Sample – Propensity Scores

The Dependent Variable is a Dummy of Inflation Targeting Regime (ITR), the Binary Treatment Variable.					
Control Variables	Baseline Model	Add Six Indctors.	Drop CPI > 50%	Drop CPI > 25%	Truncated Sample
Lagged CPI Inflation	-2.691***(0.784)	-3.378***(0.933)	-2.312***(0.897)	-0.968 (1.119)	-2.505**(1.067)
FDI (%GDP)	1.251** (0.603)	1.308** (0.645)	1.233** (0.602)	1.186**(0.604)	1.501**(0.661)
Output Growth	-1.732 (1.247)	-1.024 (1.374)	-1.785 (1.258)	-1.798 (1.272)	-0.998 (1.352)
Work Force (15-64)	5.206***(1.179)	6.772***(1.506)	5.188***(1.177)	5.268***(1.182)	3.097**(1.327)
Trade Openness (%)	-1.213***(0.141)	-1.098***(0.157)	-1.210***(0.141)	-1.203***(0.141)	-1.331***(0.155)
Financial Openness	-0.079 (0.157)	-0.604***(0.196)	-0.070 (0.156)	-.057 (0.157)	-.197 (0.175)
Exchange Rate/PPP	-0.921***(0.229)	-0.892***(0.258)	-0.911***(0.229)	-0.862***(0.231)	-1.273***(0.261)
CIT Rate	-1.100 (0.708)	-0.879 (0.793)	-1.128 (0.710)	-1.085 (0.710)	-1.099 (0.833)
PIT Rate	-1.388***(0.439)	-2.179***(0.509)	-1.320***(0.442)	-1.228***(0.444)	-1.162** (0.499)
VAT Rate	-0.137 (0.831)	0.546 (0.917)	-0.175 (0.832)	-0.231 (0.832)	0.248 (0.948)
Institutional Quality	2.237***(0.361)	-	2.240***(0.360)	2.215***(0.360)	2.949***(0.431)
Govt. Effectiveness	-	2.892***(0.874)	-	-	-
Corruption	-	-0.266 (0.758)	-	-	-
Political Stability	-	-2.474***(0.317)	-	-	-
Regulatory Quality	-	5.517***(0.829)	-	-	-
Rule of Law	-	-3.484***(0.753)	-	-	-
Voice/Accountability	-	2.048***(0.500)	-	-	-
Pseudo R ²	15%	30%	14%	13%	14%
LR (Prob > χ^2)	228.63***	454.01***	211.60***	195.31***	174.80***
Observations	1252	1252	1229	1200	955
The asterisks next to the coefficients (*, **, ***) represent their significance levels of 10%, 5%, and 1% respectively. Figures in parenthesis listed under the coefficients are Robust Standard Errors.					

Table (9) The OECD Sample – Propensity Scores

The Dependent Variable is a Dummy of Inflation Targeting Regime (ITR), the Binary Treatment Variable.					
Control Variables	Baseline Model	Add Six Indctors.	Drop CPI > 25%	Drop MICs	Truncated Sample
Lagged CPI Inflation	-4.747***(1.504)	-5.022***(1.564)	-0.886 (2.425)	-0.475 (3.064)	-8.967** (4.302)
FDI (%GDP)	2.319***(0.868)	2.116** (0.911)	2.168** (0.864)	2.141** (1.016)	2.433***(0.942)
Output Growth	1.414 (2.107)	0.370 (2.172)	1.947 (2.135)	4.574* (2.450)	5.328** (2.536)
Work Force (15-64)	-4.929 (3.129)	0.674 (3.933)	-5.054* (3.147)	-4.866 (3.492)	-12.495***(4.12)
Trade Openness (%)	-1.252***(0.245)	-1.462***(0.276)	-1.270***(0.246)	-1.534***(0.278)	-1.457***(0.293)
Financial Openness	-1.223***(0.312)	-1.669***(0.361)	-1.039***(0.319)	-1.502***(0.350)	-1.980***(0.458)
Exchange Rate/PPP	-1.132***(0.317)	-1.376***(0.357)	-1.036***(0.322)	-0.868***(0.339)	-1.467***(0.406)
CIT Rate	-1.387 (1.021)	-1.160 (1.132)	-1.509 (1.026)	-0.858 (1.093)	-1.203 (1.343)
PIT Rate	-3.319***(0.656)	-3.953***(0.711)	-3.212***(0.657)	-2.901***(0.731)	-3.578***(0.787)
VAT Rate	0.064 (1.175)	1.775 (1.319)	-0.280 (1.183)	-0.900 (1.234)	0.234 (1.413)
Institutional Quality	1.302** (0.663)	-	1.211* (0.667)	2.365***(0.832)	2.607***(0.876)
Govt. Effectiveness	-	4.880** (2.201)	-	-	-
Corruption	-	-3.285* (1.955)	-	-	-
Political Stability	-	-1.842***(0.488)	-	-	-
Regulatory Quality	-	4.357***(1.537)	-	-	-
Rule of Law	-	0.909 (1.660)	-	-	-
Voice/Accountability	-	0.257 (1.466)	-	-	-
Pseudo R ²	16.7%	22.6%	16.2%	19.1%	26.1%
LR (Prob > χ^2)	121.89***	165.13***	117.19***	124.28***	150.76***
Observations	542	542	534	491	421

The asterisks next to the coefficients (*, **, ***) represent their significance levels of 10%, 5%, and 1% respectively. Figures in parenthesis listed next to the coefficients are Robust Standard Errors.

Table (10) The MICs Sample – Propensity Scores

The Dependent Variable is a Dummy of Inflation Targeting Regime (ITR), the Binary Treatment Variable.					
Control Variables	Baseline Model	Add Six Indctors.	Drop CPI > 25%	Drop OECD	Truncated Sample
Lagged CPI Inflation	-4.225***(1.305)	-4.990***(1.534)	-3.490**(1.547)	-4.887***(1.813)	-4.522**(1.921)
FDI (%GDP)	-0.821 (1.125)	-0.796 (1.361)	-1.034 (1.138)	-1.182 (1.209)	-0.941 (1.291)
Output Growth	-6.807***(1.925)	-5.523***(2.171)	-7.308***(2.004)	-6.444***(2.146)	-8.133***(2.235)
Work Force (15-64)	8.095***(1.608)	11.182***(2.261)	8.230***(1.608)	9.038***(1.700)	5.422***(1.732)
Trade Openness (%)	-1.130***(0.232)	-0.744***(0.277)	-1.112***(0.232)	-1.447***(0.261)	-1.298***(0.262)
Financial Openness	0.818***(0.223)	0.526* (0.286)	0.841***(0.224)	0.641***(0.231)	0.731***(0.246)
Exchange Rate/PPP	2.109***(0.564)	1.876***(0.673)	2.073***(0.562)	0.886 (0.611)	1.293** (0.606)
CIT Rate	1.439 (1.231)	2.088 (1.491)	1.453 (1.237)	1.871 (1.367)	0.383 (1.402)
PIT Rate	0.803 (0.782)	1.319 (1.013)	1.086 (0.806)	-0.096 (0.931)	1.774** (0.918)
VAT Rate	-2.204 (1.539)	1.144 (1.936)	-2.137 (1.544)	-4.962*** (1.752)	-2.821 (1.783)
Institutional Quality	2.627***(0.608)	-	2.572***(0.605)	2.387***(0.666)	3.953***(0.726)
Govt. Effectiveness	-	2.021* (1.144)	-	-	-
Corruption	-	-1.015 (0.972)	-	-	-
Political Stability	-	-3.727***(0.598)	-	-	-
Regulatory Quality	-	5.829***(1.179)	-	-	-
Rule of Law	-	-3.066***(1.076)	-	-	-
Voice/Accountability	-	3.152***(0.664)	-	-	-
Pseudo R ²	29.2%	47.3%	27.3%	23.2%	28.0%
LR (Prob > χ^2)	220.33***	356.68***	199.44***	143.26***	174.89***
Observations	708	708	664	620	516
The asterisks next to the coefficients (*, **, ***) represent their significance levels of 10%, 5%, and 1% respectively. Figures in parenthesis listed under the coefficients are Robust Standard Errors.					

Table (11) The List of the Grand Sample (90) Countries

The Treatment (IT) Group		The Control (Non-IT) Group			
Albania	New Zealand	Algeria	Egypt	Luxembourg	Spain
Armenia	Norway	Angola	El Salvador	Macedonia	Sri Lanka
Australia	Peru	Argentina	Estonia	Malaysia	Switzerland
Brazil	Philippines	Austria	Finland	Mauritania	Tunisia
Canada	Poland	Azerbaijan	France	Mongolia	Turkmenistan
Chile	Romania	Belarus	Georgia	Morocco	Ukraine
Colombia	Serbia	Belgium	Germany	Netherlands	Uzbekistan
Czech Rep	South Africa	Bolivia	Greece	Nicaragua	Vietnam
Ghana	Sweden	Bulgaria	Honduras	Nigeria	Zambia
Guatemala	Thailand	Cameroon	India	Pakistan	
Hungary	Turkey	China	Ireland	Panama	
Iceland	UK	Congo Rep	Italy	P. N. Guinea	
Indonesia	United States	Costa Rica	Japan	Paraguay	
Israel		Cote d'Ivoire	Jordan	Portugal	
South Korea		Denmark	Kazakhstan	Senegal	
Mexico		Dom. Rep.	Kyrgyz Rep	Slovak Rep	
Moldova		Ecuador	Lao PDR	Slovenia	

Sources: Gamayel et al. (2011), Hammond (2012), the OECD and the World Bank.

Figure (2) Common Support for the MICs Sample

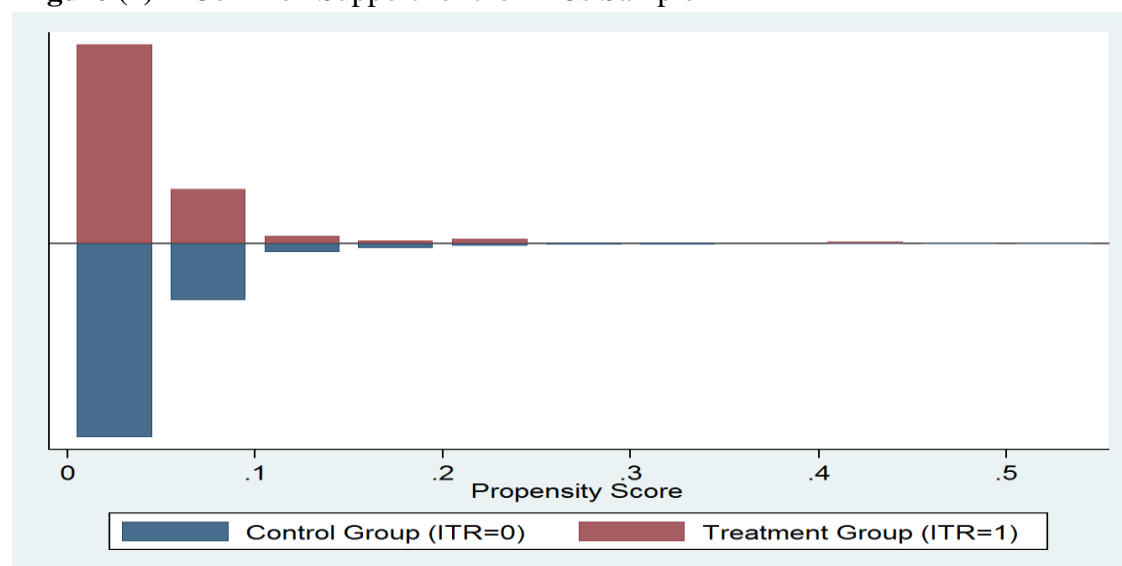


Figure (3) Common Support for the OECD Sample

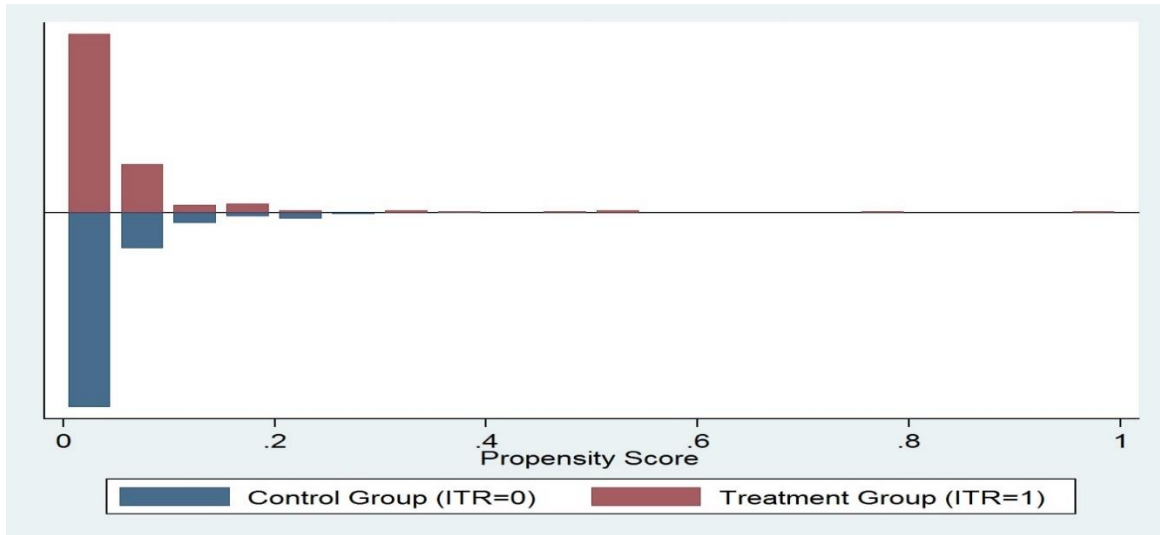


Figure (4) Overlap Plot for the MICs Sample

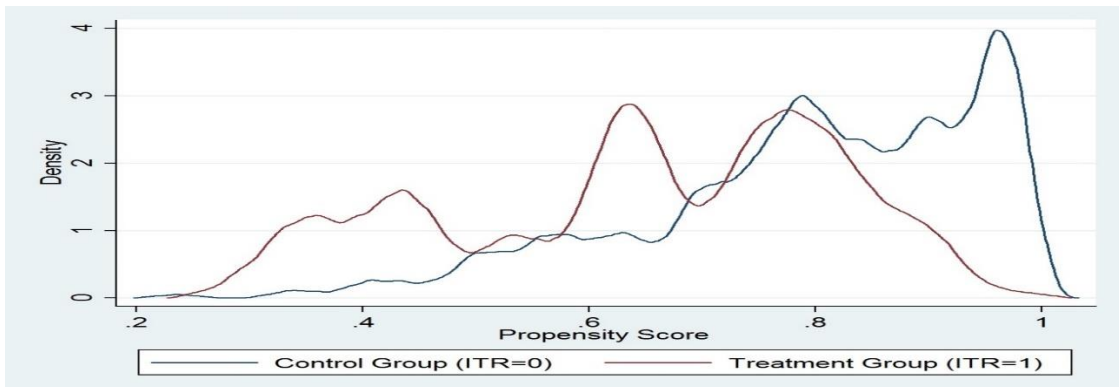


Figure (5) Overlap Plot for the OECD Sample

