

INFLATION TARGETING IN DEVELOPING COUNTRIES:
INFLUENCE ON GROWTH AND INFLATION VOLATILITY

by

Artur Kovalchuk

A thesis submitted in partial fulfillment of
the requirements for the degree of

MA in Economics Analysis

Kyiv School of Economics

2012

Thesis Supervisor: _____ Professor Oleksandr Shepotylo

Approved by _____
Head of the KSE Defense Committee, Professor Irwin Collier

Date _____

Kyiv School of Economics

Abstract

**INFLATION TARGETING IN DEVELOPING COUNTRIES:
INFLUENCE ON GROWTH AND INFLATION VOLATILITY**

By Artur Kovalchuk

Thesis Supervisor:

Professor Oleksandr Shepotylo

A growing number of developing countries are practicing inflation targeting as a monetary policy framework. If Central bank of such country wants to implement inflation targeting it has to take into account experience from other countries. This thesis provides the analysis of the changes in growth and inflation due to implementation of inflation targeting in developing countries.

In order to meet the goal the macro-data for all developing countries was chosen. The period of investigation is 1984-2011 years. Estimation shows that there is significant effect of implemented inflation targeting on inflation and variability of growth. But, there is no clear effect on growth and variability of inflation.

TABLE OF CONTENTS

<i>Chapter 1: INTRODUCTION</i>	1
<i>Chapter 2: LITERATURE REVIEW</i>	4
<i>Chapter 3: DATA DESCRIPTION</i>	9
<i>Chapter 4: METHODOLOGY</i>	17
<i>Chapter 5: EMPIRICAL RESULTS</i>	20
<i>Chapter 6: CONCLUSION</i>	23
WORKS CITED	26
APPENDIX A	31

LIST OF FIGURES

<i>Number</i>	<i>Page</i>
Figure 1: Average inflation	10
Figure 2: Average inflation (by year)	11
Figure 3: Average growth of GDP and its standard deviation	12
Figure 4: Average growth of GDP (by year)	13
Figure 5: Openness	14
Figure 6: Interest rate	15

LIST OF TABLES

<i>Number</i>	<i>Page</i>
Table 1: Summary statistics	28
Table 2: Estimation results for growth of GDP and its variability.....	29
Table 3: Estimation results for inflation and its variability.....	30
Table A: Countries with Inflation Targeting Regime.....	31

ACKNOWLEDGMENTS

The author wishes to express the sincere gratitude and appreciation to his advisor, Prof. Oleksandr Shepotylo.

The author also wants to thank his research workshop professors: Tom Coupe and Olena Nizalova for their useful comments.

Also author wants to say several words of appreciation to StataCorp for STATA, Bill Gates for MS Office and creators of ThePirateBay for existence.

Finally, author wants to thank to his mother and Olena Vozniuk for their moral support.

Chapter 1

INTRODUCTION

The latest economic crisis exposed the inefficiency of stabilization policies on the price level inside the countries, which, in its turn, altered the stable economic growth. Especially it concerns transition countries, because over the recent years, inflation in these countries has gone up sharply.

In order to keep inflation lower the Ukrainian Central Bank needs to apply more effective tools. Furthermore, one of the standard recommendations of the International Monetary Fund is inflation targeting. Nowadays the majority of countries in transition follows the IMF recommendations and undertakes specific measures to implement this kind of monetary policy.

So, it is only a matter of time the adoption of inflation targeting (IT) as a main policy framework. Moreover, in his interview the head of National Bank of Ukraine said that IT would be adopted in Ukraine and the targeted level of inflation would be equal to 5%. Despite the fact that officials talk about adopting IT there is no clear agreement about IT among them. So, the question about implementation of IT is still open.

This research will concentrate on the comparison of inflation targeters and non-targeters among emerging market countries. As a result, it will be possible to make conclusions about the effectiveness of IT. This is very important for Ukraine, because before the change of monetary regime policymakers need to be sure that it will be better for the economy. Moreover, such countries are very sensitive to external shocks due their openness. IT requires floating exchange rate and, as a result, its implementation contains some risks for economic stability.

This work investigates effect of adopting of IT in emerging market countries. According to these issues the sets of countries with (22 countries) and without IT (128 countries) will be compared. In order to make this comparison the data set will consist of:

- real GDP
- consumer price inflation
- public debt
- exchange rate
- export/import

The main source of data for this research is database of World Bank which includes all macroeconomic variables needed.

In order to meet the goal of this work, statistical methods will be applied using the panel data available. In order to capture fixed effect for variables of interest the fixed effect regressions are used. It helps to include country specific characteristics. Moreover it will be possible to include dummy variables for every year because of shock which have influence on many countries in some years (financial crisis etc.). Also it will be possible to use cross-section difference-in-difference OLS – the method applied by Ball and Sheridan (2003) for OECD countries.

Accordingly, the results of this research can be used by governmental officials and central banks for making reasonable decisions in monetary policy in order to maintain stable monetary and economic growth.

This work will consist of several chapters. In Literature review existent papers from this topic will be described. Section Methodology gives an overview of methods which will be used in order to receive expected results. Part Data

description will be devoted to data used in this research. In section Results the obtained results will be shown. Finally, the last part of this work (Conclusions) will be dedicated to some important remarks connected with the obtained results.

Chapter 2

LITERATURE REVIEW

In order to give overview of the implementation of the inflation targeting the overall description of IT per se is needed.

The definition of inflation targeting differs in details, but there are some main characteristics commonly acceptable among economists.

In general, “Inflation targeting is a framework for monetary policy characterized by the public announcement of official quantitative targets (or target ranges) for the inflation rate over one or more time horizons, and by explicit acknowledgment that low, stable inflation is monetary policy’s primary long-run goal” (Bernanke, Laubach, and Mishkin 2001).

According to Mishkin (2000), inflation targeting, as a monetary policy strategy, incorporates five main elements:

- The public announcement of medium-term numerical targets for inflation;
- An institutional commitment to price stability as the primary goal of monetary policy, to which other goals are subordinated;
- An information-inclusive strategy in which many variables, and not just monetary aggregates or the exchange rate, are used for deciding the setting of policy instruments;
- Increased transparency of the monetary-policy strategy through communication with the public and the markets about the plans, objectives, and decisions of the monetary authorities;

- Increased accountability of the central bank for attaining its inflation objectives

Implementation of all these features helps this monetary policy strategy work properly.

Since its first implementation in New Zealand (first quarter of 1990) inflation targeting has been very popular. After that inflation targeting was presented in twenty five countries (see Appendix 1). As can be seen from this table, not only industrialized but also emerging countries have adopted inflation targeting as a main monetary framework.

Inflation targeting is one of the most controversial frameworks in modern monetary policy. There is a huge number of papers with critique of implementation of IT. The main idea behind this critique is that if central bank is too focused on the level of inflation targeted then it creates some instability in economy and, as a result, tends to the lower level of output (Cecchetti and Ehrmann 1999). But more recent studies showed that there is no correlation between inflation targeting and output growth and its volatility. In their paper Ball and Sheridan (2003) compared seven OECD countries with adopted inflation targeting and thirteen countries which did not do that and authors found that targeters have at least the same level of growth on average. Moreover, among developing countries inflation targeting helps to reduce volatility in output growth and in difference between actual and natural output (output gap) (Batini and Laxton 2007).

Despite the fact that inflation targeting works properly in developed countries emerging economies are faced with several problems concerning the adoption of this monetary framework. The most important among them are mentioned in

paper written by Mishkin (2000). According to the author IT can be accompanied by:

- increase in output volatility and, as a result, lower output growth;
- sensitivity to external shocks;
- weak central-bank accountability (due to time lag).

On the one hand, all these (pre)conditions tend to decrease proper results of adopting IT. But on the other hand, according to Batini and Laxton(2007) these factors can show a higher level of development in comparison to non-targeters. But the authors did not have many observations and, as a result, this fact needs to be checked using more data. In addition, according to the portfolio theory the level of dollarization decreases as a response to a decrease of inflation volatility in such countries (Ize and Yeyati 2003).

Moreover, there is one more question, which inflation rate Central Bank ought to target? Commonly the central banks use CPI as a target that was also suggested by Guender (2001). But Mishkin (2003) showed that the central bank should use a price index that gives substantial weights to the level of nominal wage rather than CPI.

Despite the fact that there are many papers which show advantages of inflation targeting they are concentrated on the period of relative stability in these countries. But it is more important to consider the period of shocks because otherwise common monetary policy works properly. The main idea of this work

is to compare the effect of IT regime across emerging countries including periods of instability.

Also few words ought to be said about the loss function, because the central bank can pay attention not only to deviation of actual inflation and output from their targeted and natural level respectively, but also on deviation of interest rate and exchange rates. It especially concerns Ukraine because in this country there is high level of openness and, as a result, its economy is sensitive to external shocks. In order to take into account this problem the measure of openness will be included into regressions.

Despite the fact that the implementation of IT is actively discussed among economists around the world, this topic is not very developed in Ukraine. There are several works concerned implementation of inflation targeting. One of these papers, Petryk (2009) gives general description of this monetary policy framework per se. Also, there is a paper written by Makarenko, Diakonova and Juravko (2008) in which authors described different strategies of implementation of inflation targeting and its consequences for the economy. Moreover, as was mentioned above, inflation targeting accompanied with flexible exchange rate. Mishchenko, Nidzelska et. al. (2010) examined consequences of this regime in terms of output.

Most of papers which concern implementation of inflation targeting as a monetary framework for the National Bank of Ukraine, including that mentioned above, did not compare effects of implementation on the current situation. All of them describe IT per se, but do not support their ideas empirically.

Finally, all previous studies about inflation targeting in emerging market countries have two main distinctions from this work:

- he set of countries. The maximum number of countries which were considered is 45. In this research the set of countries was expanded to all emerging market countries (according to IMF classification).

T

- ifferent methodology. In previous papers effect of IT was investigated using or sacrifice ratio or using average of dependent variables before and after implemented IT. In this paper other methodology is used and this approach helps to keep more observations in the data and, as a result, receive more precise estimatoion.

D

Chapter 3

DATA DESCRIPTION

The set of emerging countries was chosen based on classification used by IMF. Using this classification, developed countries are excluded from set of all countries in the world. As a result in the dataset there are 150 countries. From this list the set of countries with implemented IT – 22 countries were chosen.

In the Appendix A there is list of countries with IT and the date of its implementation.

For investigation of the stability of economic performance two main variables as dependent variables are considered: growth, inflation and their average deviations from the mean.

For investigation of the economic performance the set of explanatory variables was chosen:

- Exchange rate E
- Inflation rate; I
- Interest rate; I
- Net Export; N
- Export and Import as share of GDP E

- growth of GDP

Due to the fact that quarterly data is not available for all emerging market economies the annual data is used. The main source of the data is World Bank Development Indicators Database and International Financial Statistics from International Monetary Fund. These databases have all data needed for this research. Based on variables from these datasets there will be additional variables constructed.

For countries with implemented inflation targeting the dummy variable is created. But, due to different years of implementation the additional dummy variable can be used.

As a result, the country is considered as targeter from year of implementation IT if IT was adopted during first three months of the year. If IT was adopted after first three months then this country was considered as targeter from next period.

On the Figure 1 the average inflation is shown. Its value is calculated for every year. In this case inflation for targeter in pre-targeting period belongs to non-inflation targeting country. So, this figure summarizes results for Table 1 in case of inflation.

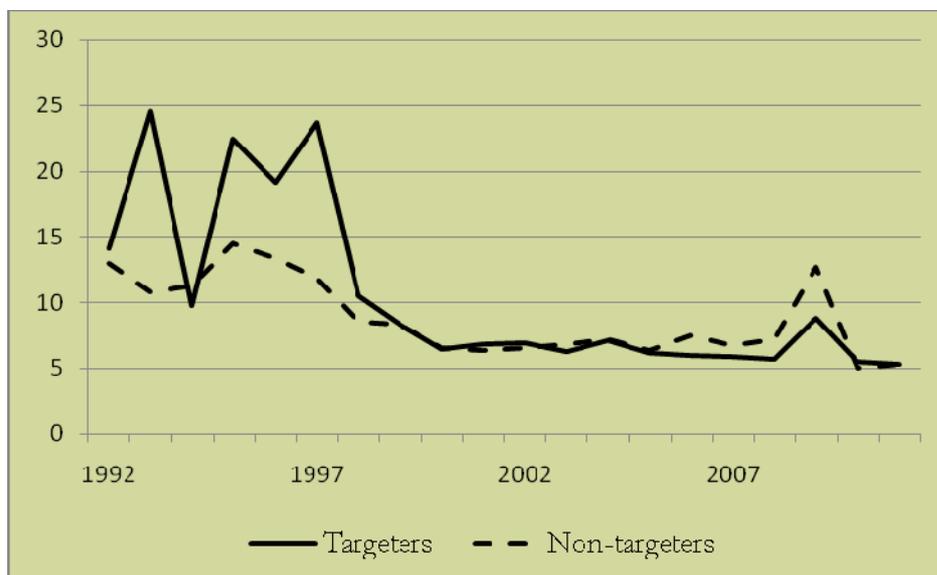


Figure 1. Average inflation

As can be seen from summary statistics in Table 1 countries with IT as a monetary policy framework there is lower level of inflation. In this case average inflation for targeters is 8%, but in nontargeters close to 9%. Also the standard deviation in countries with inflation targeting is lower: 7.54% while for nontargeters 10.32%.

In contrast, if the average is calculated without connection to the data of implementation IT, results are different. From Figure 2 it can be seen that average inflation is higher in countries with implemented IT. The main reason for such results is higher inflation during pre-targeting period. But, during last decade the average inflation in two types of countries moves closer to each other. Moreover, during the period of financial crisis, average inflation was lower for targeters.

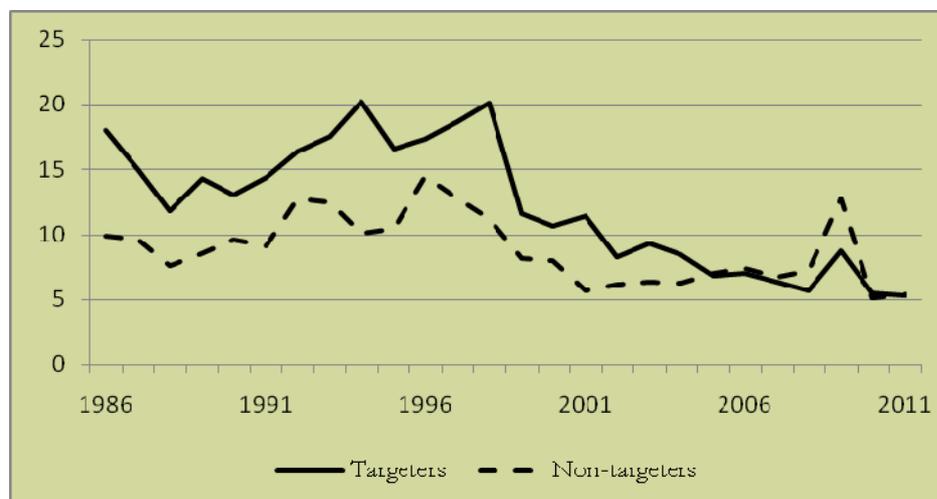


Figure 2. Average inflation (by year)

But, these huge differences could be caused by method of calculation. Firstly, the number of countries is relatively low. As a result, there is stronger influence of one particular country. Moreover, if such country has a period of hyperinflation then there will be huge increase of average country for this type of countries.

Also, due to the fact that in some countries there were periods of very high inflation level there can be contamination of the data. In order to avoid the occasional influence of these extremely high values it is possible to restrict them on the some level. In case of inflation, all numbers higher than 50 were dropped. This strategy was also used in paper written by Goncalves and Salves (2008). The main reason for that is trying to keep more observations in the data-set. Otherwise, by excluding data for country with very high inflation there will be too small number of observations because too many countries experienced periods of hyperinflation.

Growth of GDP, on average, is higher in IT-countries and is equal to 5.09. In countries without IT GDP growth is equal to 4.23%. In contrast, nontargeters

have higher volatility of growth. Standard deviation in such countries is equal to 5.47% while in targeters by 1% lower.

Figure 3 summarizes these results.

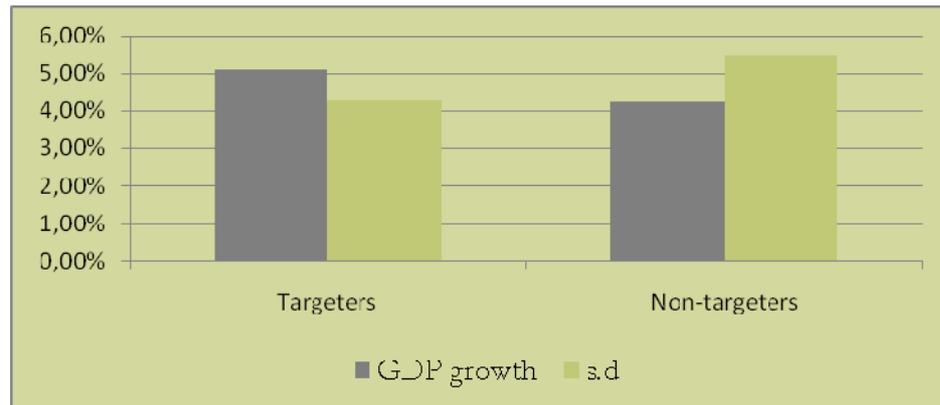


Figure 3. Average growth of GDP

Figure 4 describes average growth rates of GDP when it is calculated with different groups of targeters and nontargeters for every specific year (only one country for 1992 and 22 in 2011). As it can be seen from this figure, countries with implemented inflation targeting grew faster all the time before the financial crisis. After that when countries were influenced by crisis the growth rate for targeters decline sharply and more than nontargeters. Despite this fact, recovering is faster in countries with adopted IT.

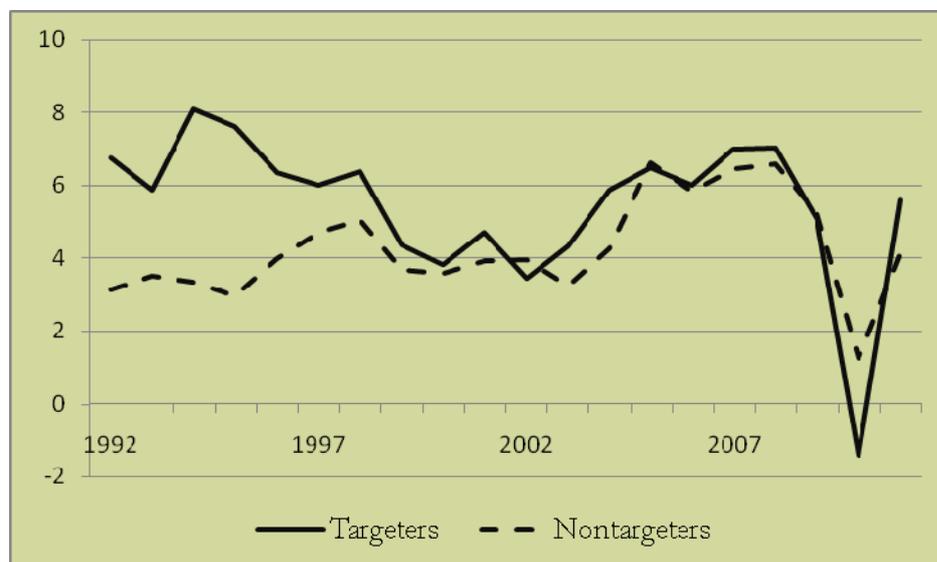


Figure 4. Average growth of GDP (by year)

Moreover, there some variables that can help to describe sensitivity to external shocks. The common feature for all developing countries is higher level of import then in developed countries. As a result, the net export in these import oriented countries is very low. But, in case of economies without targeted level of inflation the value of net export is even lower than total average and is equal to -35.44% against -24.79% in countries with targeted level of inflation. Moreover, targeters have lower level of variability of net export which is equal to 20.11% when for nontargeters this value is equal to 25.51%.

For investigation of influence of external shocks including exchange rate is not enough. As a result, the measure of openness is included into regressions.

Openness, which is calculated as the sum of export and import as share of GDP is also higher in developing then in developed countries. But, for countries with inflation targeting as a main monetary policy framework the level of openness is

smaller and is equal to 40.38% while in non-targeting inflation countries openness is equal to 48.86%. Moreover, targeters have lower level of variability of openness. In this type of countries standard deviation is equal to 19.89% while in other countries this value is much higher and is equal to 27.11%.

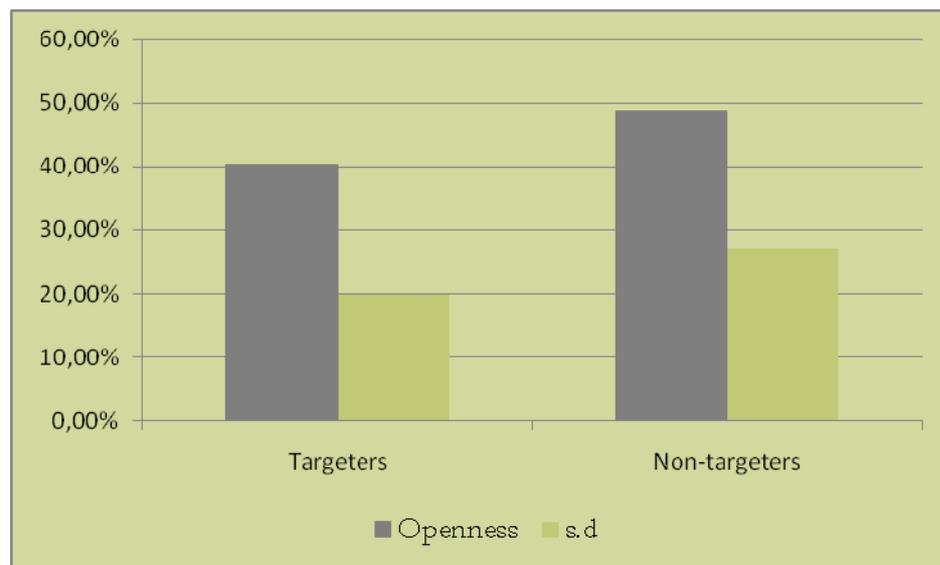


Figure 5. Openness in IT and non-IT countries

So, as was mentioned earlier, developing countries are more sensitive to external shocks. These shocks have influence on economic performance through variability of net export and exchange rate.

In order to capture the effect of exchange rate regime (fixed or flexible) it is possible to incorporate dummy variable into the model. But, we are more interested in the real effect of this regime because in some countries there can officially fixed exchange rate but central bank can not to keep this rate in the fixed level.

Interest rate (IR) is higher in countries with inflation targeting. The average value of IR is equal to 10.63% in countries with IT while in other type of countries it is equal to 8.05%. But, Standard deviation is also higher for targeters and is equal to 15.13% against 10.34% for others.

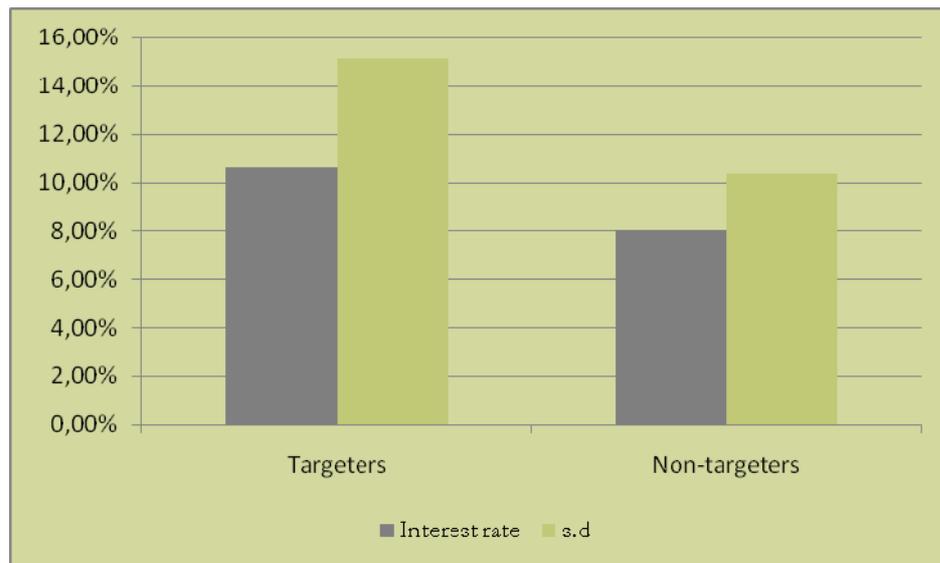


Figure 6. Interest rate

Table 1 describessummary statistics of variables.

Finally, it is important to mention that according to summary statistic countries with implemented inflation targeting have better economic performances. For most of the variables these countries have lower variability.

Chapter 4

METHODOLOGY

Due to the fact that IT was implemented in different periods in different countries it is better to use panel data which captures variation of variables across countries at different periods. This method has more advantages in comparison to ones used in Goncalves and Salles(2008). They used cross-section difference-in-difference OLS for emerging countries, the same approach as Ball and Sheridan (2003).

In order to select countries with IT it is possible to create dummy variable for them. But, in this case periods without implemented IT also will be included. That is why, in order to show time path under IT there is dummy variable with values 0 and 1 (1 – for targeters and 0 – for non-targeters) for every year. In this case country which implements IT is considered as nontargeter before such implementation and targeter after. This procedure helps to make clear difference between two types of countries during time path.

The studying is based on the empirical model similar to those used in paper written by Bysedt and Brito(2008):

$$y_{n,t} = \alpha \cdot y_{n,t-1} + \beta \cdot D_{n,t}^{IT} + \sum \gamma_i \cdot X_{n,t} + \delta_t + \eta_n + v_{n,t} \quad (1)$$

where: $y_{n,t}$ is variable of interest (volatility of growth or inflation); subscript n for country and t is for year. The coefficient β describes influence of IT in variable y . $D_{n,t}^{IT}$ is dummy variable which is equal to 1 if country n has

implemented IT regime. As a result, such country can have $D = 0$ before accepted inflation targeting and $D = 1$ since the adoption. Elements of vector $X_{n,t}$ are variables mentioned above (lagged values of dependent variables, exchange rate etc.) which can have influence on dependent variable.

Moreover, one of the main characteristics of IT is floating exchange rate regime. In order find whether there are different effects of implemented floating and IT the data about official ER is included in the regressions. It would be possible create dummy variable (for fixed ER Dummy=0 and for floating ER Dummy=1). But, data about changes of ER with fixed effect regressions will capture this fact because there is ambiguity about officially floating exchange rate and fixed in that sense that national bank can frequently revise the last. And de-jure fixed exchange rate can de-facto be considered as floating.

Also it is possible to have biased estimator β because usually period before implementation of IT accompanied by high inflation and lower economic performance. But, fixed effect regressions will eliminate this problem.

Moreover, it is important to mention that different countries have different initial values and other own characteristics. That is why it is important to use fixed effect regressions.

It is important to mention that there can be some specific influence for every year (year effect). In order to eliminate this influence it is important to control for this effect.

For every variable of interest two types of regression are used. In every regression when there are lagged value for variable of interest the Arellano-Bond regression are used. Other type of regressions uses year effect.

Finally, using fixed effect in regressions it is possible to take into account the country specific conditions. Including year effect into regressions helps to capture year specific influences.

Chapter 5

EMPIRICAL RESULTS

In order to investigate influence of implementation of inflation targeting on economic performance several regressions were run with different specifications.

In order to verify that fixed effect regressions are needed (not random) the Housman test was done. According to this test, fixed effect is appropriate for our purposes. As a result, this captures all fixed influences on dependent variable. Also it takes into account mean of dependent variables because we are interested in size of deviation from the mean.

Table 2 summarizes results of estimation for GDP. As it can be seen from this table, if Arellano-Bond methodology is used then there is significant effect of implemented IT on growth of GDP. The coefficient near dummy variable for targeters is equal to -2.86. This means that countries with IT on average experienced by 3% lower inflation.

But, if year effect is added into regressions then the effect of IT disappears. This result confirms the results obtained from previous studies that there is no effect of implementation of inflation targeting on output growth.

On the other hand, the adoption of inflation targeting has influence on output variability. Results of estimation shows, that implemented IT helps to reduce average deviation from the mean by 2%. The level of significance is equal to 1%. This result obtained using Arellano-Bond methodology.

If year effect is taken into account than the effect of implemented IT becomes lower and is equal to -0.62%. Level of significance is lower too and it is equal to 10%.

Table 2 summarizes received results of estimation of the effect of implemented IT on output growth and its variability.

The results, obtained from estimation of influence of implemented inflation targeting on inflation are expected. There is strong and significant negative effect of IT on the rising of general level of prices. If Arellano-Bond procedure is used then estimation shows that level of inflation in countries with inflation targeting is smaller by 3.49% than in countries without IT. This value is significant on 5% level. But, if year effect is included into regression than this difference in average inflation level becomes smaller and is equal to 2.86%, but the level of significance is 1%.

Also the influence of exchange rate is significant with negative sign. Estimation results show that flexible exchange rate regime helps to reduce inflation. The influence of this regime captured also by dummy for inflation targeting. There some countries which do not target inflation but have flexible exchange rate. As a result, the coefficients for this variable from Table 2 describe remaining part of influence.

In case of variability of inflation estimation shows that implemented inflation targeting has negative effect on deviation of inflation. So, countries with IT regime have on average more stable inflation. In this countries average deviation from the min of inflation is lower by 2.24% and level of significance is 5%.

But, including year effect into regressions eliminates this result. Coefficient near variable of interest is also negative but not significantly different from zero.

Table 3 summarizes received results of estimation of the effect of implemented IT on inflation and its variability.

Moreover, in order to investigate annual influence of inflation targeting on inflation variability there was created variable of interaction of dummy for targeter for every year and year. But, these coefficients were not significant.

Chapter 6

CONCLUSIONS

Inflation targeting is a relatively new monetary policy framework. Despite the fact that the more and more countries have adopted IT there is no clear agreement about its influence on economic performance.

According to the theory there is tradeoff between high inflation and high level of economic growth from the one hand or lower inflation and lower output from other hand. If central bank tries to keep inflation on the stable low level then it can reduce level of GDP growth.

One group of studies shows that there is positive effect of implemented inflation targeting on economic performance. But, other studies conclude that there is no effect of IT on economic situation.

The main goal of this research is to investigate influence of adopted inflation targeting on output, inflation and their variability in developing countries.

In order to meet the goal, dynamic panel data is used for all developing countries.

According to results of this research, implementation of inflation targeting has ambiguous effect on economic growth. But, IT helps to reduce average absolute deviation from the mean of output growth. The value of the effect depends on methodology used. As a result, this reduction varies from -2% to -0.62%.

Also there is one expected result that countries with implemented inflation targeting as a main monetary policy framework have lower level of inflation. So,

these countries not only de-jure have this monetary policy regime but really use available instruments in order to keep inflation lower.

But, there are still no clear results for inflation variability. If the central bank announces targeted level of inflation, if this announcement is trustable, then there will be stabilization of inflationary expectations. As a result, variability of inflation has to be lower. According to the results, the average deviation from the mean reduces by 2.24% for Arellano-Bond estimation. But, if year effect is included, this influence is not statistically significant. This result shows that formal and institutional aspects of inflation targeting have no influence on variability of inflation.

Results of this research can be used by policy-makers in order to make clear decision about implementation of IT in developing countries, particularly in Ukraine.

Ambiguity of some results can be further investigated in order to find more clear result about influence of inflation targeting regime on some macroeconomic variables.

For further research it is possible to try different specifications. Also, it is can be useful to form different groups of countries from set of targeters and nontargeters. Also different methodology can be used or different criteria for comparison of economic performance. For example, the some type of loss function will capture effect of losses.

Finally, according to received results, in this research there are no supported arguments against adoption of IT. And still there are positive effect in terms of inflation and output variability. So, if country will adopt inflation targeting as a

main monetary policy framework it will be at least better off in terms of level of inflation and output variability.

WORKS CITED

Ball, Laurence. 1999. "Policy rules for open economies." *NBER Working Papers*, January, pp. 127-156.

Ball, Laurence and Niamh Sheridan. 2003. "Does Inflation Targeting Matter?" *NBER Working Paper*, March.

Batini, Nicoletta and Douglas Laxton 2007. "Under What Conditions Can Inflation Targeting be Adopted." in *Monetary Policy under Inflation Targeting*, edited by Klaus Schmidt-Hebbel and Frederic Mishkin. Santiago: Central Bank of Chile.

Bernanke, Ben S., Thomas Laubach, and Frederic S. Mishkin. 2001. *Inflation targeting: lessons from the international experience*. Princeton University Press ed.

Bysedt, Brianne and Ricardo D. Brito. 2008. "Inflation targeting in emerging economies: Panel evidence." *Inspere Working Paper*.

Cecchetti, Stephen G. and Michael Ehrmann. 1999. "Does Inflation Targeting Increase Output Volatility? An International Comparison of Policymakers' Preference and Outcomes." *NBER Working Paper*, December.

FitzGerald, Valpy. 2004. "Monetary Models and Inflation Targeting in Emerging Market Economies." *Discussion Paper Series*, May.

Goncalves, Carlos E. S. and Joao Salles. 2008. "Inflation targeting in emerging economies: What do the data say?" *Journal of development economics* (85):312-318.

Guender, Alfred V. 2001. "Inflation Targeting in the Open Economy. Which Rate of Inflation to Target?"

Ize, Alain and Eduardo L. Yeyati. 2003. "Financial dollarization." *Journal of International Economics* (59):323-347.

Levin, Jay H. 2004. "A Model of Inflation targeting in an open economy." *International Journal of Finance and Economics* 347-362.

Mankiw, N. G. and Ricardo Reis. 2003. "What Measure of Inflation Should a Central Bank Target?" *Journal of the European Economic Association*, September, pp. 1058-1086.

Melecky, Ales and Martin Melecky. 2010. "From inflation to exchange rate targeting: Estimating the stabilization effects for a small open economy." *Economic Systems* 34:450–468.

Mishkin, Frederic S. 2000. "Inflation Targeting in Emerging-Market Countries." *The American Economic Review*, May, pp. 105-109.

Orphanides, Athanasios and John C. Williams. 2007. "Inflation Targeting under Imperfect Knowledge." *Economic Review - Federal Reserve Bank of San Francisco*, pp. 1-18.

Parrado, Eric. 2004. "Inflation Targeting and Exchange Rate Rules in an Open Economy." *IMF Working Paper*, February.

Roger, Scott. 2009. "Inflation Targeting at 20: Achievements and Challenges." *IMF Working Paper*, October.

Svensson, Lars E. 2000. "Open-economy inflation targeting." *Journal of International Economics* 155-183.

Міщенко, В.І., І.А. Нідзельська, А.П. Кулінець, and С.О. Шульга. 2010. "Гнучкий режим курсоутворення: етапи запровадження та можливі наслідки для економічного розвитку України." *Науково-аналітичні матеріали, НБУ*.

Петрик, Олександр І. 2009. "Інфляційне таргетування як механізм забезпечення цінової стабільності в Україні." Дисертація.

Петрик, М.І. та І.І. Д'яконова, 2008. *Стратегія інфляційного таргетування в грошово-кредитній політиці держави*. Суми: ДВНЗ "УАБС НБУ".

Table 1. Summary statistic

Groupofcountries	Statistics	Inflation	GDP growth	Interest rate	Net Export (% of GDP)	Openness (% of GDP)
Non-targeters	mean	8.94	4.23	8.05	-35.44	48.86
	s.d	10.35	5.47	10.34	25.51	27.11
Targeters	mean	8.03	5.09	10.63	-24.79	40.38
	s.d	7.54	4.27	15.13	20.11	19.89
Total	mean	8.86	4.31	8.31	-34.41	48.03
	s.d	10.15	5.39	10.94	25.23	26.61

Table 2. Estimation results for growth of GDP

VARIABLES	GDP growth	GDP growth	GDP growthvar.	GDP growthvar.
	(1)	(2)	(3)	(4)
targeter_year	-2.858*** (0.840)	-0.454 (0.493)	-1.995*** (0.601)	-0.623* (0.343)
GDP lagged	-0.0504** (0.0210)	0.237*** (0.0203)		
Openness	0.0905*** (0.00613)	0.0673*** (0.00560)	0.00399 (0.00426)	0.000461 (0.00389)
ER	-0.000460*** (0.000172)	1.47e-07 (7.07e-05)	-0.000344*** (0.000129)	6.71e-06 (4.92e-05)
IR dev	0.00251 (0.00428)	-0.00802** (0.00331)	-0.000804 (0.00289)	-0.00182 (0.00231)
Lagged GDP dev.			-0.0837*** (0.0212)	0.169*** (0.0213)
Constant	0.467 (0.344)	-0.0490 (0.616)	3.829*** (0.243)	3.357*** (0.435)
Yeareffect		yes		yes
R-squared		0.224		0.076

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 3. Estimation results for inflation and its variability

VARIABLES	inflation	inflation	deviation	deviation
	(1)	(2)	(3)	(4)
targeter_year	-3.487** (1.472)	-2.857*** (0.873)	-2.239** (1.061)	-0.312 (0.616)
Inflationlagged	0.105*** (0.0246)	0.369*** (0.0258)		
Openness	0.00179 (0.00997)	0.000482 (0.00947)	-0.00633 (0.00715)	0.000361 (0.00674)
ER	-0.00171* (0.000889)	-0.00125*** (0.000331)	-0.00228*** (0.000647)	-2.39e-05 (0.000236)
IR dev	0.0740** (0.0317)	0.0871*** (0.0294)	0.180*** (0.0225)	0.130*** (0.0209)
Laggeddeviat.			-0.0893*** (0.0282)	0.148*** (0.0302)
Constant	3,443* (1,790)	2,531*** (665.7)	4,593*** (1,304)	50.73 (474.4)
Yeareffect		yes		yes
R-squared		0.275		0.108

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

APPENDIX

Table A. Countries with Inflation Targeting Regime

Country	AdoptionDate	
	Year	Month
New Zealand ¹	1990	Q1
Canada ¹	1991	M2
United Kingdom ¹	1992	M10
Sweden ¹	1993	M1
Finland ¹	1993	M2
Australia ¹	1993	M4
Spain ¹	1995	M1
Czech Republic ¹	1997	M12
Israel ¹	1997	M6
Poland ²	1998	M10
Brazil ²	1999	M6
Chile ²	1999	M9
Colombia ²	1999	M9
South Africa ²	2000	M2
Thailand ²	2000	M5
Korea ¹	2001	M1
Mexico ²	2001	M1
Iceland ¹	2001	M3
Norway ¹	2001	M3
Hungary ¹	2001	M6
Peru ²	2002	M1
Philippines ²	2002	M1
Guatemala ²	2005	M1
Slovakia ¹	2005	M1
Indonesia ²	2005	M7
Romania ²	2005	M8
Turkey ²	2006	M1
Serbia ²	2006	M9
Ghana ²	2007	M5

Source: Roger (2009); www.centralbanknews.info

1. High income countries, based on World Bank Development Indicators classification;
2. Low income countries, based on World Bank Development Indicators classification.

