# Charles University in Prague

Faculty of Social Sciences
Institute of Economic Studies


BACHELOR THESIS

# Central Bank Transparency and Price Stability


Author: **Dominika Katuščáková**

Supervisor: **Doc. Roman Horváth Ph.D.**


Academic Year: **2012/2013**

## Declaration of Authorship

I hereby declare that I compiled this thesis independently, using only the listed resources and literature. This thesis was not used to get any other academic degree.

I also grant Charles University the permission to reproduce and to distribute copies of this thesis document in whole or in part.

Prague, May 14, 2013

Signature

## Acknowledgments

I would like to express my gratitude to Doc. Roman Horváth Ph.D. for his insightful ideas, support and time spent supervising the thesis. My gratitude belongs also to my parents for their lasting support through my studies.

# Bibliography

KATUŠČÁKOVÁ, Dominika. *Central Bank Transparency and Price Stability.* Prague, 2013, 73 s. Bachelor Thesis (Bc.) Charles University, Faculty of Social Sciences, Institute of Economic Studies. Supervisor Doc. Roman Horváth Ph.D.

# Abstract

The thesis investigates the central bank transparency employing the Monetary Policy Transparency Index. The main objective is to investigate recent trends in the central bank transparency.

First, the level of monetary policy transparency is investigated from various aspects, as, for instance, time or geographical aspect. In the next part, all the data are averaged and linear regression analysis is carried out to detect the determinants of the monetary policy which explain the variation among the individual central banks. Finally, panel regressions are conducted to explore the time variation in the monetary policy transparency in the countries.

Throughout the text, all the results are compared with the results presented in the paper by Dincer & Eichengreen (2009). The data show that the overall time trend in the level of monetary transparency is increasing. It can be concluded that inflation targeters are generally more transparent than countries with other frameworks. The same applies to advanced countries and emerging and developing countries. The *de facto exchange rate regime* and all political variables used significantly determine the variation in the monetary policy transparency comparing individual countries. *GDP per capita* and *financial depth* significantly influence the time variation in the Monetary Policy Transparency Index.

# Abstrakt

Práca skúma transparentnosť centrálnych bánk za použitia indexu transparentnosti monetárnej politiky. Hlavným cieľom je preskúmať súčasné trendy v transparentnosti centrálnych bánk.

Najskôr je level transparentnosti monetárnej politiky skúmaný z rôznych uhlov pohľadu napríklad na základe časového a geografického hľadiska. V ďalšej

časti sú všetky dáta spriemerované a na určenie determinantov monetárnej politiky, ktoré vysvetľujú variáciu medzi jednotlivými centrálnymi bankami, je použitá analýza lineárnou regresiou. V závere sú predložené výsledky panelových regresií, ktoré majú za úlohu objasniť časové zmeny v transparentnosti monetárnej politiky v krajinách.

Počas celého textu sú všetky výsledky porovnávané s výsledkami prezentovanými v článku od Dincer & Eichengreen (2009). Dáta ukazujú, že celkový trend v čase je rastúci. Z výsledkov tiež môžeme usúdiť, že krajiny, ktoré cieľujú infláciu sú transparentnejšie ako krajiny, ktoré aplikujú iný rámec menovej politiky. To isté platí aj pre vyspelé a rozvojové krajiny. *De facto režim výmenného kurzu* a všetky použité politické premenné signifikantne určujú variáciu v transparentnosti monetárnej politiky pri porovnaní jednotlivých zemí. *HDP na obyvateľa* a premenná vyjadrujúca pomer peňazí a kvázipeňazí k HDP signifikantne vplývajú na časovú variáciu v indexe transparentnosti monetárnej politiky.

## Keywords

central bank transparency, monetary policy transparency index, determinants of the monetary policy transparency, price stability

## Kľúčové slová

transparentnosť centrálnych bánk, index transparentnosti monetárnej politiky, determinanty transparentnosti monetárnej politiky, cenová stabilita

# Contents

# List of Tables

# List of Figures

# Bachelor Thesis Proposal

| | |
|---|---|
| **Author** | Dominika Katuščáková |
| **Supervisor** | Doc. Roman Horváth Ph.D. |
| **Proposed topic** | Central Bank Transparency and Price Stability |

**Jazyk práce** anglický

**Kľúčové slová** transparentnosť centrálnych bánk, menová politika, komunikácia centrálnych bánk, predvídateľnosť, dôveryhodnosť, nástroje menovej politiky, inflácia

**Kľúčové slová anglicky** central bank transparency, monetary policy, central bank communication, predictability, credibility, monetary policy instruments, inflation

**Predbežná náplň práce** Transparentnosť centrálnych bánk sa stáva jednou z hlavných tém týkajúcich sa centrálneho bankovníctva, čo bude aj téma mojej práce. Začiatok bude mať formu teoretického úvodu obsahujúceho definíciu alebo definície transparentnosti, jej rôzne formy, ukazovatele a indexy, ktoré v literatúre slúžia na jej kvantifikáciu. V ďalšej časti bude mojou snahou zachytiť vývoj transparentnosti z niekoľkých hľadísk, ktoré budú zodpovedať jednotlivým kapitolám práce. Prvým z nich bude časové hľadisko, čo znamená zmeny v miere transparentnosti v čase. Druhým hľadiskom bude rozdielnosť v miere transparentnosti v závislosti na miere otvorenosti ekonomiky, teda do akej miery je otvorenosť ekonomiky prepojená s mierou transparentnosti centrálnej banky. Tretím hľadiskom, ktorý by som chcela zahrnúť do svojej práce, je rozdielnosť transparentnosti v rôznych typoch centrálnych bánk delených podľa rámca menovej politiky. Medzi tie najviac vyskytujúce sa patria cieľovanie inflácie, kontrola výmenného kurzu a cieľovanie peňažnej ponuky. V závere svojej práce by som chcela skúmať vplyv transparentnosti na cenovú

stabilitu.
Cieľom práce bude ukázať, že postupom času sa transparentnosť centrálnych bánk zvyšuje, a to hlavne v rozvíjajúcich sa ekonomikách. Takisto sa budem snažiť potvrdiť predpoklad, že centrálne banky, ktoré spadajú do rôznych rámcov monetárnej politiky, sú rôzne transparentné. Každá z nich preferuje iné nástroje, ktoré používa k dosiahnutiu vyššej miery transparentnosti.

**Preliminary scope of work** The central bank transparency becomes very frequently analysed theme in the field of central banking and this is also the theme of my thesis. The introduction will consist of theoretical part including definitions of transparency, its various forms and indices that are used in literature for its measurement. In the next part I would like to capture central bank transparency from different points of view. These will be represented in the individual chapters of the thesis. First of them will be the time criterion, mainly changes of central bank transparency over time. The second aspect I would like to include is what are the differences in degree of transparency in open and closed economies. The very last section will be devoted on the impact of the transparency on the price stability.
The goal of the thesis will be to show that during the examined period there was an increase in central bank transparency, mostly in developing and transitional countries. I will also try to prove the assumption that different central banks belonging to different frameworks achieve different degrees of transparency. Money targeters, inflation targeters and also exchange rate targeters use different means for reaching higher level of transparency.

## Literatúra

1. Crowe, Ch. & E. E. Meade(2007): *"The Evolution of Central Bank Governance around the World"* Journal of Economic Perspectives **4(21)** online [https://woc.uc.pt/feuc/getFile.do?tipo=2id=7696]

2. Crowe, C. & E. E. Meade (2008): *"Central bank independence and transparency: Evolution and effectiveness."* online[http://www.imf.org/external/pubs/ft/wp/2008/wp08119.pdf], International Monetary Fund.

3. Van der Cruijsen C.& M. Demertzis (2007): *"The impact of central bank transparency on inflation expectations"* European Journal of Political Economy **23(16)** online [http://www.sciencedirect.com/science/article/pii/S0176268006000887]

4. Van der Cruijsen C. A. B., Eijffinger S. C. W. & P. M.Geraats (2006): *"Does Central Bank Transparency Reduce Interest Rates?"* Cambridge: University of Cambridge. online [http://www.econ.cam.ac.uk/faculty/geraats/tpintrate.pdf]

5. Dincer, N. B. Eichengreen (2009): *"Central bank transparency: Causes, consequences and updates."* online [http://www.nber.org/papers/w14791.pdf], *National Bureau of Economic Research.*

6. Eijffinger, S. C. P. M. Geraats (2006): *"How transparent are central banks?"* European Journal of Political Economy **22**: p. 21

7. Geraats, P. M. (2002): *"Central bank transparency."* online [http://www.wm.tu-berlin.de/fileadmin/fg124/geldtheorie/literatur/geraats.pdf], University of Cambridge.

8. Geraats, P. M. (2006): *"Transparency of monetary policy: Theory and practice."* CESifo Economic Studies **52**: p. 32.

9. Horváth, R., K. Šmídková & J. Zápal (2010): *"Central Banks? Voting Records and Future Policy."* CNB WORKING PAPER SERIES Praha, Czech Republic: Czech National Bank, Economic Research Department. online [http://ideas.repec.org/p/cnb/wpaper/2010-11.html]

10. Neuenkirch, M. (2012): *"Managing financial market expectations: The role of central bank transparency and central bank communication."* European Journal of Political Economy **28(1-13)**: p. 13.

11. Wooldridge, J. M. (2002): *"Introductory Econometrics - A Modern Approach"* South-Western, 2nd revised edition edition edition.

Author Supervisor

# Chapter 1

# Introduction

In the last two decades, increasing interest in the field of central bank transparency can be observed. Beginning in the 1990s, a considerable amount of economists have started more detailed research in this economic area. Up until 2006, when the Monetary Policy Transparency Index was presented, there had been no appropriate instrument for the quantification of this variable. Since then, a substantial number of comprehensive researches was published.

The difference between the term of the central bank transparency and of the monetary policy transparency should be explained in detail. Except the monetary policy transparency, we distinguish for example also transparency in the field of financial stability communication. Central bank transparency includes both phenomena, so it can be said that it is more general term. As this work studies only the monetary policy transparency and no ambiguity can occur, both terms are used as synonyms.

The reason for the increasing attention dedicated to the central bank transparency has been the continuously growing independence of the central banks connected with more sensitive perception of the influence central banks' decisions have on the market participants. Also the central banks themselves investigate to what extent the transparency is effective in affecting the market behavior. Thanks to the easier quantification of the transparency of monetary policy, the phenomenon is also investigated in connection to other macroeconomic indicators as, for example, central bank independence or the price stability.

The main aim of the thesis is to link and to update the results from the one of the most advanced papers published in this field in recent years. This thesis will closely follow the Dincer & Eichengreen (2009) work. The objective

of the thesis is to present the main economic and political determinants of the central bank transparency and to find out to what extent the conclusions made in the paper can be applied in the present time. The thesis will apply the same methodology as used in the paper updating the results for years 2007 to 2011 using data from Horváth & Vaško (2013).

Based on the results offered in Dincer & Eichengreen (2009), the following assumptions can be made: The overall trend in the Monetary Policy Transparency Index in years 2007 to 2011 is rising following the increasing trend in the period examined by the paper. The average MPT Index is higher in advanced countries and countries that operate as inflation targeters than in the emerging and developing countries and countries which employ other monetary policy frameworks, respectively. We can also assume that the *de facto exchange rate regime* and all the political variables are statistically significant determinants of the central bank transparency.

The thesis is structured as follows: chapter 2 offers the overview of the great deal of literature dedicated to the subject of monetary policy transparency. The next section of the chapter 2 summarizes different approaches in the definition of the concept of the central bank transparency. The chapter is concluded with proper definitions of the instrument used to measure the monetary policy transparency - Monetary Policy Transparency Index. chapter 3 represents the theoretical part of the thesis. In the first subsection it proposes very detailed characterization of all the variables employed in the analysis and the second subsection describes the methodology used for the econometric analysis. This subsection presents the three main methods used for the manipulation with the panel data: first differencing, fixed effects and random effects. The subsection also summarizes the criteria according to which the most appropriate method will be chosen. chapter 4 sums up the results of the study in four subsections. The first one deals with the overview of basic characterizations of the data. The second and the third subsections present the results of the linear regressions and the last subsection is focused on the panel data regressions and their outcomes.

# Chapter 2

# Theoretical framework

## 2.1 Literature overview

In recent years, mainly years before the global financial crisis, there has been increasing number of works published on the theme of central bank transparency. One of the most active authors in the field of transparency is Dr. Petra M. Geraats. In her very first work (Geraats 2000), Geraats proposes five types of transparency: (1) political transparency, (2) economic transparency, (3) procedural transparency, (4) policy transparency and (5) operational transparency.

In her later work (Geraats 2002), Dr. Geraats focuses, inter alia, on the uncertainty and incentive effects of the transparency for which she offers theoretical background. Eijffinger & Geraats (2006) elaborate quantitative measurement of the transparency. In the paper, they are presenting the Monetary Policy Transparency Index for nine major central banks. Dincer & Eichengreen (2009) extend the Monetary Policy Transparency Index to 100 central banks worldwide providing econometric analysis and the analysis of the effects of the transparency on inflation variability and inflation persistence.

Large amount of work is devoted to the interaction between the central bank transparency and other macroeconomic phenomena. Reasons for or against publishing the interest rate forecasts are the main theme of the paper by Filáček *et al.* (2007). Neuenkirch (2012) investigates the effect of informal central bank communication on the central bank transparency. Crowe & Meade (2008) study the relationship between the central bank transparency and the central bank independence concluding that *"greater transparency is associated with the private sector making greater use of public rather than private information."*

## 2.2 Definition of transparency

The core definition of transparency is presented by Geraats (2002): *"Central bank transparency could be defined as the absence of asymmetric information between monetary policymakers and other economic agents."* Doctor Geraats provides more detailed explanation, she states that transparency *"does not imply that monetary policymakers and the private sector have complete information... but perfect transparency means that both face the same information and uncertainties."*(Geraats 2006)

Geraats also names two essential effects of transparency: uncertainty and incentive effects. The uncertainty effect arises when *"asymmetric information generates uncertainty for the agents that experience the information disadvantage, and provides the opportunity for others to directly exploit the presence of private information."*(Geraats 2002) The origin of the incentive effect is explained in the following way: *"...those with access to private information may try to manipulate the beliefs of others through signaling; the response to the signal could influence the sender's incentives, and thereby indirectly alter economic behavior..."*(Geraats 2002)

Building on previous findings, Geraats presents very similar concept of information and incentive effects (Geraats 2006). Information effects are characterized as direct, ex post effects, whereas incentive effects as indirect, ex ante effects. The concept of the information effects is based on the fact that via publishing the information, the central bank loses its information advantage and other economic agents have more information which they can use to adjust their economic behavior. On the other hand, incentive effects are *"structural changes in economic behavior that result from the different information structure under greater transparency."* (Geraats 2006)

Dincer & Eichengreen (2009) present two views on the transparency. The first view is characterized by the following statement: *"transparency enhances the effectiveness of monetary policy."*(Dincer & Eichengreen 2009) This view represents the fact that with increasing transparency the effectiveness of conducting the monetary policy also increases. As the market participants are more informed, the probability of raising instability on the market and probability of market disturbances would be lower. Consequently, the reactions of market participants can be more easily predicted by the central bank which then has better control over the market. The second attitude towards transparency offered in the paper is transparency as *"a mechanism for democratic account-*

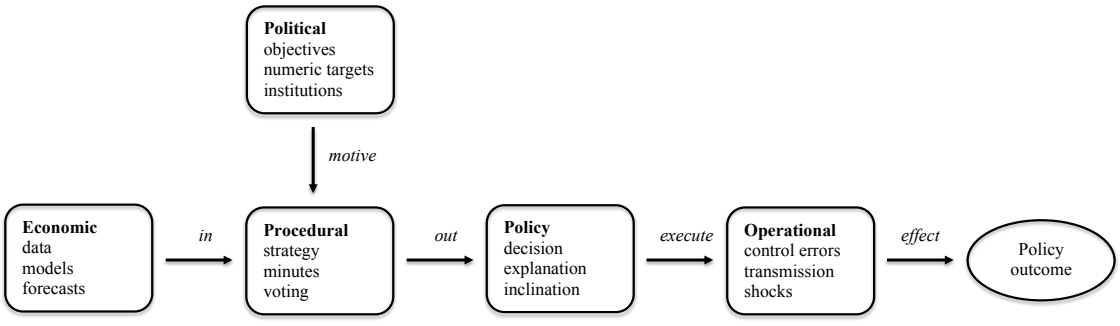
*ability in a world of policy discretion and central bank independence."*(Dincer & Eichengreen 2009) The authors argue that with divergence from institutions as gold standard and movement towards more flexible exchange rates together with increasing independence of the central bank there has to be clear level of central bank accountability. Central bank transparency clarifies who and to what extent is responsible for the decision-making process and ensures the decisions will be in the interest of the public, or at least, the reasons for the decisions will be explicit.

As mentioned above, Geraats (2000) defines five aspects of transparency:

- political transparency: openness about policy objectives, like explicit inflation targets
- economic transparency: disclosure of economic data, models and central bank forecasts
- procedural transparency: information about the monetary policy strategy and internal policy deliberations, for instance through the release of minutes and voting records
- policy transparency: communication of policy decisions, like changes in the interest rate, and statements about likely future actions
- operational transparency: openness about the implementation of policy decisions, market interventions and control errors

The relationships between the five elements of central bank transparency are graphically displayed in the following figure:

Figure 2.1: Conceptual framework for the monetary policymaking process




*Source:* Eijffinger & Geraats (2006)

## 2.3 Monetary Policy Transparency Index

As the measure of central bank transparency the Monetary Policy Transparency Index will be used in the thesis. MPTI, as evolved by Eijffinger & Geraats (2006), includes 15 subindices divided into five categories according to the type of transparency (political, economic, procedural, policy, operational). Every category includes 3 concrete questions which are aimed at the practical aspects of the transparency. Eijffinger & Geraats (2006) offer also possible answers together with the score. The range of the MPTI score lies between 0 and 15 where scoring 15 points means the central bank is fully transparent. The complete characterization of the index is provided in the Appendix A.

Political transparency focuses on the publication of monetary policy objectives and their prioritization and quantification. Economic transparency captures the extent to which the economic data used for monetary policy making, macroeconomic models and macroeconomic forecasts are published. Procedural transparency subindex concentrates on disclosing monetary policy rule or strategy, the minutes of voting (or explanation of decisions made by single central banker) and voting records. Policy transparency captures the promptness of publication of monetary policy decisions and their explanations in conjuction with the communication of the policy inclination. Operational transparency refers to evaluation of achieving the policy objectives and providing information on macroeconomic disturbances which can have impact on decisions about the policy-making.

# Chapter 3

# Data and methodology

## 3.1 Definitions of variables

The data on Monetary Policy Transparency Index come partially from Dincer & Eichengreen (2009) (for the years 2000 to 2006) and from Horváth & Vaško (2013) (for the period from 2007 to 2011).
The source of the most explanatory variables is the World Bank and its database[1] which is freely accessible. These variables are: *GDP per capita*, *financial depth*, *openness* and most of the political variables[2] (*political stability*, *rule of law*, *voice and accountability*, *government efficiency* and *regulatory quality*).
The second very valuable source was the International Monetary Fund. The data for *consumer price index* and the *de facto exchange rate regime* originate from the IMF database called International Financial Statistics[3]. Data on the *level of economic development* were obtained from the World Economic Outlook Report from October 2012.[4]
The data for the rest of the political variables, namely *democracy*, *autocracy* and *overall polity score*, are taken from the Polity IV database[5]. This source is also used by Dincer and Eichengreen as the source of all political variables.
Concerning monetary policy framework, this thesis employs distribution into two groups: inflation targeting and other frameworks. The list of the inflation targeters is taken from Franta *et al.* (2011). The data about the years of the adoption are collected mainly from Martínez (2008), for Armenia the data

[1] http://data.worldbank.org/indicator
[2] http://info.worldbank.org/governance/wgi/sc_country.asp
[3] http://elibrary-data.imf.org/FindDataReports.aspx?d=33061e=169393
[4] http://www.imf.org/external/pubs/ft/weo/2012/02/pdf/text.pdf
[5] http://www.systemicpeace.org/inscr/inscr.htm

come from Banaian *et al.* (2008), for Ghana from paper Alichi *et al.* (2009), for Guatemala from Aguilar (2010), for Indonesia from Inoue *et al.* (2012), for Romania from Tanasie (2009) and for Serbia from Memorandum on Inflation Targeting as Monetary strategy[6].

The detailed characteristic of all explanatory variables is offered in the table below. The definitions of the variables are taken from the sources described in the previous paragraphs.

Table 3.1: Description of all variables used

| MPTI | Monetary Policy Transparency Index |
|---|---|
| per capita income | GDP per capita in current US $ |
| inflation history | lagged log first difference of the consumer price index |
| de facto exchange rate regime | ordinal variable taking values from 0 to 7 according to the level of flexibility (higher values for more flexible regimes)[1] |
| financial depth | money and quasi money as percentage of GDP |
| openness | exports of goods and services as percentage of GDP |
| development dummy | binary variable taking value 0 for emerging and developing countries and 1 for advanced countries |
| inflation targeting | binary variable taking value 1 if country is inflation targeter and zero otherwise |
| voice and accountability | captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media, ranges from -2.5 (the lowest possible score) to 2.5 (the highest possible score) |

[1]in ascending order: exchange arrangements with no separate legal tender, currency board arrangements, conventional fixed peg arrangements, pegged exchange rates within horizontal bands, crawling pegs, exchange rates within crawling bands, managed floating with no predetermined path for the exchange rate and independently floating exchange rate

[6]of Serbia (2008)

Table 3.2: Description of all variables used cont.

| | |
|---|---|
| democracy | ordinal variable taking values from 0 to 10 measuring the level of democracy in the country deliberating three main elements: 1. *"presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders"*, 2. *"the existence of institutionalized constraints on the exercise of power by the executive"*, 3. *"the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation"*(Marshall *et al.* 2011) |
| autocracy | ordinal variable taking values from 0 to 10 measuring the level of autocracy in the country taking into account the essential attributes: *"chief executives are chosen in a regularized process of selection within the political elite, and once in office they exercise power with few institutional constraints"*(Marshall *et al.* 2011) |
| overall polity score | the difference between the democratic score and the autocratic score, the range vary between +10 (for the most democratic countries) and -10 (for the most autocratic countries) |
| political stability | measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism, ranges from -2.5 (the lowest possible score) to 2.5 (the highest possible score) |
| rule of law | captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence, ranges from -2.5 (the lowest possible score) to 2.5 (the highest possible score) |
| government efficiency | captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies, ranges from -2.5 (the lowest possible score) to 2.5 (the highest possible score) |

It might seem from the definitions that the variables *autocracy* and *democracy* are exact opposites of each other and only one of them should be chosen as the independent variable. In the next chapter we will actually see that these two variables are strongly correlated (Table B.8). However, the value of the correlation is not precisely $-1$. To understand why this is not so and why both variables should be studied, we have to look more closely on the way the variables are constructed.

The quantification of both variables is based on the scales presented in the Appendix A (Table A.1 and Table A.2). After more detailed look at the tables it can be noted *"that the two scales do not share any categories in common."*(Marshall *et al.* 2011) In other words it may happen, for example, that whereas the country gains full score in democracy, inter alia, due to the possibility of citizens to participate on the elections, it also receives some points in autocracy scale because of the fact the choice of candidates in the elections is restricted (the competitive political participation is limited).

Also the relationship of *autocracy* and *democracy* with *overall polity score* cannot be expressed as the 100% correlation in spite of the definition of *overall polity score* as the difference between the *autocracy* score and *democracy* score. This is due to the fact that some observations are treated in a special way. For instance, in case there is foreign interruption the value of the observation will be $-66$. All these special values from the original dataset are considered as missing values in the thesis.

## 3.2 Econometric background

The data used are in the form of panel data. There are two basic models used for analyzing panel data sets (Wooldridge 2002): fixed effects model (sometimes also denoted as unobserved effects model) and random effects model. Three main techniques are used to estimate these two models. First differencing and fixed effects estimation are usually employed for fixed effects model and random effects estimation for random effects model.
The fixed effects model is in form of:

$$y_{it} = \beta_0 + \beta x_{it} + a_i + u_{it} \tag{3.1}$$

where $y_{it}$ is the explained variable, $x_{it}$ is the explanatory variable, $a_{it}$ is the

fixed effect (also called unobserved effect or unobserved heterogeneity) and $u_{it}$ is the idiosyncratic error. The model can be also rewritten as:

$$y_{it} = \beta_0 + \beta x_{it} + v_{it} \tag{3.2}$$

where the term $v_{it} = a_i + u_{it}$ is referred to as composite error. Except the first-differenced estimation and the fixed effects estimation, also OLS estimation can be used to estimate the fixed effects model. However in this case the estimation will be biased and inconsistent if $a_i$ and $x_{it}$ are correlated which is in practice very often the case. To allow this correlation, the first differencing and the fixed effects estimation are based on the reduction of unobserved effect from the model.

The main idea of the first-differenced estimation lies in differencing the data across time periods. If we have two time periods:

$$y_{i2} = \beta_0 + \beta x_{i2} + a_i + u_{i2} \tag{3.3}$$

$$y_{i1} = \beta_0 + \beta x_{i1} + a_i + u_{i1} \tag{3.4}$$

and we subtract the second equation from the first, the model is:

$$\Delta y_i = \beta \Delta x_i + \Delta u_i \tag{3.5}$$

This way the unobserved effect is eliminated. The same method is applied in more time periods case as well where data in two adjacent period are always differenced.

Fixed effects estimation uses similar principle. First, all the data are averaged over the time and then the averages are substracted from the original equation. Consequently, the equation with time-demeaned data is obtained:

$$\ddot{y}_{it} = \beta_1 \ddot{x}_{it} + \ddot{u}_{it} \tag{3.6}$$

where $\ddot{y}_{it} = y_{it} - \bar{y}_{it}$ (valid also for $\ddot{x}_{it}$ and $\ddot{u}_{it}$).

Random effects estimation is employed for random effects model which looks alike the fixed effects model with the only difference that $Cov(x_{itj}, a_i) = 0$. However we do not want to eliminate the unobserved effect. The basic principle of random effects estimation is quasi-demeaning of the data. The final model looks as in the 3.5 or 3.6 but the interpretation of variables and error term is

different:

$$\dot{y}_{it} = y_{it} - \lambda\bar{y}_i = \beta_0(1-\lambda) + \beta_1(x_{it1} - \lambda\bar{x}_{i1}) + \cdots + \beta_k(x_{itk} - \lambda\bar{x}_{ik}) + (v_{it} - \lambda\bar{v}_i) \quad (3.7)$$

where $\lambda = 1 - \left(\frac{\sigma_u^2}{\sigma_u^2 + T\sigma_a^2}\right)^{1/2}$, $\sigma_u^2 = Var(u_{it})$, $\sigma_a^2 = Var(a_i)$, $T$ number of time periods and $\bar{y}_i$ is time average.

When deciding between first-differenced and fixed effects estimation the latter will be used if $u_{it}$ are uncorrelated. For choosing between fixed effects and random effects estimations, Hausman test will be employed.

The Hausman test examines the correlation between the unobserved effect and the idiosyncratic error:

$$H_0 : Cov(x_{it}, a_i) = 0$$

Under the null hypothesis, fixed effects estimator is consistent as well as the random effects estimator. But the random effects estimator is more efficient. To summarize, random effects model is used when we are also interested in the impact of unobserved effect on the explained variable. Another big advantage of the RE estimation is the fact that it allows estimation of the data which do not change over time.

For the manipulation with the data Stata software will be used.

# Chapter 4

# Empirical results

## 4.1 Overview of the data

The data used are in the form of panel data with 98 countries and observations are collected for years 2000 to 2011. As stated before, the data for years 2000 to 2006 are drawn from Dincer & Eichengreen (2009) and for years 2007 to 2011 from Horváth & Vaško (2013).They emphasize that the data are obtained from the documents available on the central banks' websites. Geraats (2006) draws attention to the fact that not the form but the content of the document published by central bank is important and adds that only documents written in English should be taken into account.

Tables B.1 to B.6 show the overall score in all the followed countries in the period between years 2000 and 2011. The tables contain also unweighted average scores for the continents and their individual regions. The most transparent continent is Europe scoring 8.75 points followed by Oceania and both Americas. The fourth and fifth place is occupied by Asia and Africa, respectively. Africa scores only 4.65, that is only slightly more than 50% of the score for Europe.

Regarding monetary policy transparency in regions, the leader is Australia and New Zealand with 12.5 points especially thanks to full score for the Reserve Bank of New Zealand. The second place belongs to Western Europe with 11 points. This is due to the fact that all Eurozone countries are classified to be Western Europe countries and they all gained 11 points, as this is the amount of points for the European Central Bank. The top three is completed by Southern Africa with 2.67 points less. This results from the fact that only three countries (2 of them gaining 9 and 10.5) are listed as part of Southern

Africa. The three least transparent regions (named in ascending order) are Northern Africa, Eastern Africa and Melanesia which is not very unexpected.

These findings are in line with the findings presented in the paper (Dincer & Eichengreen 2009) however there is a change in the position of Southern Africa, specifically shift from the fifth position in year 2006 to the third in year 2011. This improvement in the transparency can be caused by a slight change in data collecting method.

It is more representative to report weighted averages in the evaluation as the importance of the national economies in the world economy may be captured more precisely. In this work, GDP-weighted averages will be presented (overall country GDP is used a weight). Table B.7 summarizes all the results. The order of the continents starting with the most transparent is: Americas, Oceania, Europe, Asia and Africa. The difference between the first and the third place is only 0.08 points so it can be said the level of transparency considering the first three continents is rather balanced. The fourth and fifth positions experienced no change at all. Africa again gained the lowest score, although improving to 6.37 points.

As far as regions are concerned, the ones with the highest level of transparency are Northern Europe, Northern America and Western Europe. All these regions score 11 or more points. Contrariwise, the smallest level of transparency is achieved in Southern Asia, Northern Africa and Eastern Africa (in ascending order), neither of them scoring more than 4 points. In these ranking there is no such surprising result as is with the Southern Africa in non-weighted averages results. Comparing with the paper, the only difference is that in the results from the paper the third place belongs to Oceania. This increase in the ranking of Western Europe can be most likely explained by the enlargement of the Eurozone, as between years 2006 and 2011 four countries entered the Eurozone all consequently scoring 11 points for transparency.

Looking at the individual central banks, Table 4.1 presents 13 countries whose central banks belong to the most or least transparent. The Reserve Bank of New Zealand is the only central bank with the perfect score. Geraats (2002) states that the main reason might be early adoption of the inflation targeting which occurred in the beginning of the 1990s. Only half point less received central bank of Sweden - Sveriges Riksbank. Bank of England occupies the third position with 11.5 points. Central banks of Czech Republic, Hungary and USA all achieved score of 11.5 points, sufficient for the fourth place in the ranking. It is not very unexpected that none of the Asian or African

central banks can be found in the top six. On the other hand none of the seven least transparent central banks belong to the central banks of Europe, Northern America or Australia and New Zealand. There is only one exception, Bermuda, which is classified as northern-american state. We can see that four central banks received only one point: Bermuda, Ethiopia, Libya and Saudi Arabia. As far as Libya is concerned, the low score is to large extent caused by the very unstable political situation in the country preventing the authorities from updating the central bank website regularly. Low score of Saudi Arabia can be to some degree caused by the fact that the Saudi Arabian Monetary Authority acts in accordance with Islamic law - Sharia. Sharia is very specific in the way that, for instance, it prohibits interests (Kuran 1986). As a result, there can be no information on interest rates published by the central bank. This explanation can be also applied to the low score of Yemen and Libya. However, there are countries, like Indonesia, which also adopted Islamic banking but score substantially more points. Aruba, Solomon Islands and Yemen scored only half point more. Compared to the results presented in the paper, there is not much variation. Sweden and New Zealand swapped their positions, New Zealand receiving one extra point whereas Sweden remains at the very same transparency level. The Bank of Canada and the European Central Bank fell out from the top six, being replaced by the Federal Reserve. The composition of the bottom six is the same as in the paper, only the Central Bank of Solomon Islands was added into the Table 4.1.

Overall time trend in Monetary Policy Transparency Index is captured in the Figure 4.1 (GDP-weighted averages are used for the computation). Comprehensive increase in the level of transparency can be noted. Despite the decline between the years 2009 and 2011, there is significant increase of 1.14 points in the year 2011 compared to the year 2000. This conclusion is consistent with the one made by Geraats (2006): *"Transparency of monetary policy has increased remarkably during the last 15 years."* referring to the period between the years 1990 and 2005. Also Dincer & Eichengreen (2009) come to similar conclusion. In addition, they state: *"Strikingly, none of our 100 countries moved in the direction of less transparency."* To be more concrete, this statement refers to the comparison of the years 1998 and 2006 (the paper originally studies time period beginning already in the year 1998). There are countries that experience negative year-to-year change (e.g. Rwanda or Jamaica), however, none of the examined countries scored less in the year 2006 than in the year 1998. That is why the drop in the level of transparency in the year 2006 compared

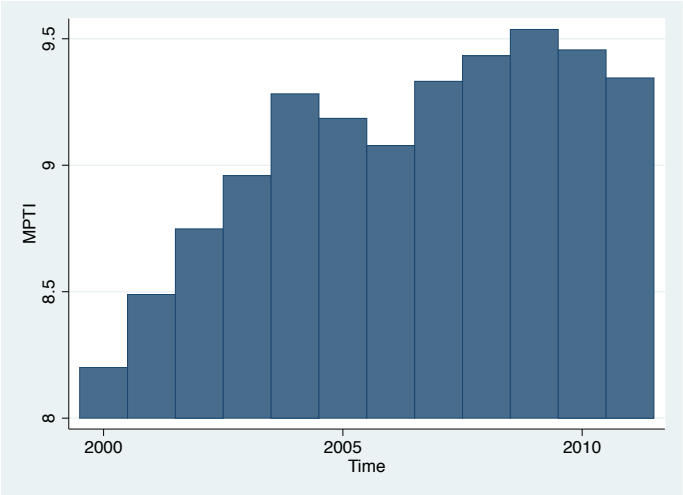
to the year 2005 in the Figure 4.1 is not inconsistent with this statement. This can not be concluded using the updated data. Three countries, namely Brazil, Cuba and Solomon Islands, experienced drop in the score. The difference is maximum of 1 point and one of the reasons for that might by the different source of the data. Central banks of eight countries did not changed their level of transparency compared to ten countries in the year 2006.

Table 4.1: Monetary Policy Transparency Index in countries with extreme values

| country | 1a | 1b | 1c | 2a | 2b | 2c | 3a | 3b | 3c | 4a | 4b | 4c | 5a | 5b | 5c | TI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New Zealand | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 15 |
| Sweden | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.5 | 1 | 14.5 |
| UK | 1 | 1 | 1 | 1 | 0 | 1 | 0.5 | 1 | 1 | 1 | 1 | 1 | 0.5 | 1 | 0.5 | 12.5 |
| Czech Republic | 1 | 1 | 1 | 1 | 0 | 1 | 0.5 | 1 | 1 | 1 | 1 | 0 | 1 | 0.5 | 0.5 | 11.5 |
| Hungary | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0.5 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 11.5 |
| USA | 0.5 | 0 | 1 | 1 | 0 | 1 | 0.5 | 1 | 1 | 1 | 1 | 1 | 0.5 | 1 | 1 | 11.5 |
| Aruba | 0.5 | 0 | 0 | 0.5 | 0 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.5 |
| Solomon Islands | 0.5 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.5 |
| Yemen | 1 | 0 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.5 |
| Bermuda | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Ethiopia | 0.5 | 0 | 0 | 0 | 0 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Libya | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| Saudi Arabia | 0.5 | 0 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

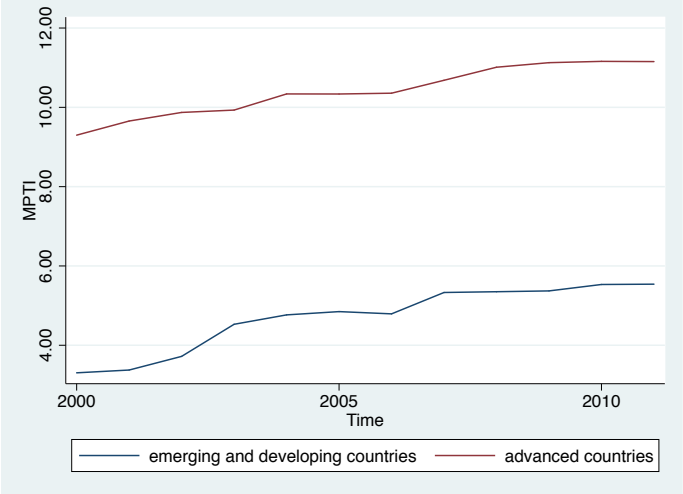
The Figure 4.2 displays the time trend of monetary policy transparency according to the level of economic development. The countries are divided into two categories: the emerging and developing countries and advanced countries. No strict criteria are developed for the classification, it is historically based. Nevertheless, there are analytical criteria according to which countries are categorized as emerging and developing countries. *"The analytical criteria reflect the composition of export earnings and other income from abroad; a distinction between net creditor and net debtor economies; and, for the net debtors, financial criteria based on external financing sources and experience with external debt servicing."* (Out 2012) The GDP-weighted averages are again used to obtain the results. It is evident that the level of transparency in advanced countries is globally higher than in emerging and developing countries. Both groups experience rise over the followed time period. The growth rate is similar

Figure 4.1: Time trend in MPT Index




*Source:* Own calculation

Figure 4.2: Time trend in MPT Index in countries organized according to the level of economic development




*Source:* Own calculation

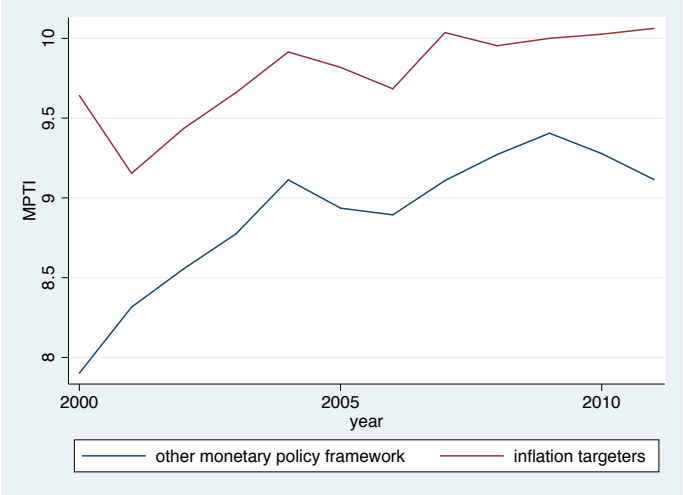
in both categories, however, it can be seen that emerging and developing countries experienced steeper growth in time period from year 2000 to 2002 than the countries belonging to the second group. These findings are consistent with the conclusions made by Dincer & Eichengreen (2009).

Figure 4.3 investigates the time trend in the monetary policy transparency in countries organized according to the monetary policy framework. Division in two groups is used as in the previous case. The central banks are categorized as inflation targeters or as banks applying another monetary policy framework, e.g. money targeters or exchange rate targeters. Country is characterized as inflation targeter when the central bank does not focus on the intermediate goals but the inflation target rate is explicitly stated. (Debelle *et al.* 1998) The significant difference between the level of transparency in both group can be very clearly noticed even though central banks of both types undergo rising time trend. The notable decrease of transparency in the inflation targeters group in year 2001 can be explained by the fact that Mexico with relatively low score in transparency started to set targets for inflation. The same can be applied also to significant drop in year 2007 when Guatemala adopted inflation targeting. However, in this case also another explanation comes under consideration. The decrease can be caused by the different source of the data. These results are very alike the conclusions of Geraats (2006) who states: *"transparency tends to be more common for inflation targeters."* Despite of this Geraats (2006) warns that *"the adoption of inflation targeting does not guarantee transparency in all respects."*

It is very interesting to look at the average value of individual subindices in year 2011 (Figure 4.4). Evidently, the political transparency, i.e. publication and specification of policy objectives, is the most common scoring on average 1.9 points. The second place belongs to policy transparency with 1.3 points. The operational transparency is at least common gaining only 0.8 points on average. Comparing the number of countries receiving the full score, the winner is policy transparency with 18 countries in year 2011 which is huge difference compared to two central banks in year 2006. 14 central banks received 3 points in political transparency. It is more unusual to achieve full score for the three remaining types of transparency among the central banks in the sample. Only five central banks scored 3 points in procedural transparency, 4 in operational and 3 in economic transparency indicating that central banks consider publication of economic data, macroeconomic models and forecasts less important or more demanding. These results are very close to the results in Dincer &

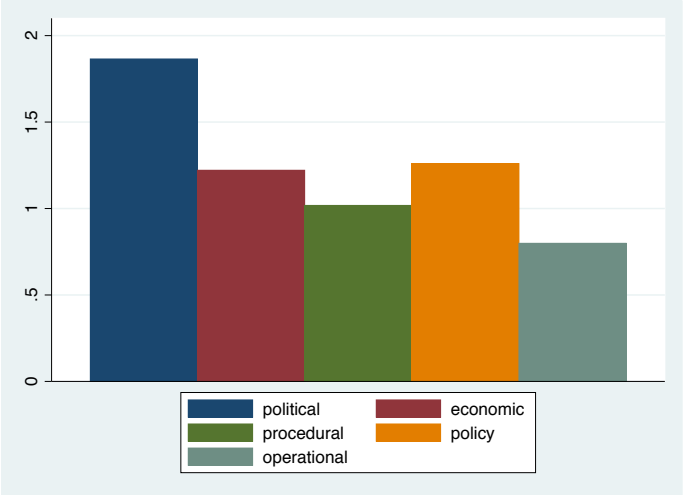
Eichengreen (2009). The publication of economic forecasts is also one of the subjects of study of Geraats (2006). The author discovers that *"over* 75% *of central banks publish forward-looking analysis. However, more detailed forward-looking analysis is far less common. In particular, only* 41% *of central banks release forecasts that are published more than annually."* Also communication of quantitative forecasts, risks to forecasts and forecast errors is not very frequent. They are provided by 37%, 34% and 32% respectively.

Figure 4.3: Time trend in MPT Index in countries organized according to the monetary policy framework




*Source:* Own calculation

Figure 4.4: Average value of the MPTI subindices in 2011




*Source:* Own calculation

## 4.2 Analysis of determinants of MPTI using averaged data

Following the methodology of Dincer & Eichengreen (2009), in this section the results of regressions using GDP-averaged data will be presented. We will try to find the determinants of monetary policy transparency via the regression analysis. First of all, the authors propose strong correlation between the political variables (*rule of law*, *political stability*, *voice and accountability*, *government efficiency*, *overall polity score*, *democracy* and *autocracy*). The correlation matrix in Table B.8 shows the correlation of variables with each other. Even though there is an indication of some strong relationships between the political variables (e.g. 96% correlation between *government efficiency* and *rule of law*), the correlation are on average lower than in the paper. The relatively strong correlation between some of the above mentioned variables is not surprising. Particularly, the strong negative correlation between democracy and autocracy ($-84.5\%$) can be easily explained. The regime is more democratic, from definition, the less autocracy elements it expresses. Lower correlations are the reason why, unlike in the paper, in one of the regressions I used all the political variables at once. The outcomes of all the regressions are offered in the Table 4.2. All the regressions were tested for heteroskedasticity using White and Breush-Pagan tests and no heteroskedasticity was found in any of the regressions at 5% confidence interval.

Table 4.2: Regression analysis of Monetary Policy Transparency Index using averaged data

| | I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|
| constant | 1.17 | 2.57*** | 1.58* | 2.47*** | 2.61*** | 0.59 | 4.22*** | 2.22** |
| | (1.64) | (0.89) | (0.95) | (0.81) | (0.85) | (0.87) | (0.98) | (0.85) |
| GDP per capita | -0.00 | -0.00 | 0.00 | 0.00 | -0.00 | 0.00** | 0.00*** | 0.00*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| past inflation | -8.03 | -12.72 | -21.43 | -16.37 | -3.45 | -27.32* | -29.40* | -27.47* |
| | (16.17) | (17.68) | (18.93) | (15.93) | (17.28) | (15.85) | (-29.40) | (16.04) |
| de facto exchange rate regime | 0.35*** | 0.61*** | 0.67*** | 0.52*** | 0.53*** | 0.38*** | 0.30** | 0.32*** |
| | (0.12) | (0.11) | (0.12) | (0.10) | (0.10) | (0.11) | (0.12) | (0.11) |
| financial depth | 0.00 | 0.01 | 0.01** | 0.01* | 0.00 | 0.01 | 0.01 | 0.01 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| rule of law | -0.32 | 1.98*** | | | | | | |
| | (0.99) | (0.49) | | | | | | |
| political stability | -0.48 | | 0.70* | | | | | |
| | (0.40) | | (0.37) | | | | | |
| voice and accountability | 0.92 | | | 1.81*** | | | | |
| | (0.99) | | | (0.31) | | | | |
| government efficiency | 1.99** | | | | 2.41*** | | | |
| | (0.96) | | | | (0.48) | | | |
| democracy | -0.34 | | | | | 0.44*** | | |
| | (0.82) | | | | | (0.07) | | |
| autocracy | 0.95 | | | | | | -0.55*** | |
| | (0.88) | | | | | | (0.10) | |
| overall polity score | 0.70 | | | | | | | 0.27*** |
| | (0.83) | | | | | | | (0.04) |
| No. of observations | 80 | 88 | 88 | 88 | 88 | 80 | 80 | 80 |
| R-squared | 0.70 | 0.52 | 0.45 | 0.59 | 0.56 | 0.63 | 0.58 | 0.62 |

*Note:* *** significant at the 1% level, ** significant at 5% level, * significant at 10% level, standard errors are in the parentheses

As mentioned before, in the first regression, all of the political variables are used. From this regression it can be concluded that the *de facto exchange rate regime* and *government efficiency* are significant determinants of the monetary transparency, even at the 5% level of significance. As expected, the *de facto exchange rate regime* has positive effect on the transparency. From the definition of the variable (Table 3.2) follows that the more flexible exchange rate regime country adopts the more transparent the central bank is. This is very rational conclusion as in case of very rigid exchange rate regimes which are very easily predictable the central bank is not forced to publish detailed information. Also the positive impact of *government efficiency* is not unexpected. *Government efficiency* characterized as the perception of quality of public services and their implementation and formulation is directly positively correlated with the central bank transparency as central bank is considered to be a part of public sector.

The regressions II to VIII include only one political variable at a time. The *de facto exchange rate regime* is significant in all cases, still having assumed positive effect on monetary transparency. In those regressions, the political variables are highly significant with positive influence on the MPT Index. Only the *autocracy* variable is negatively correlated with the index which is in line with our assumption. *Government efficiency* has the highest coefficient meaning it has the most substantial effect. The coefficient of 2.41 (significant at 1% confidence interval) can be interpreted in the following way: increase in *government efficiency* by 1 point increases the monetary policy transparency index by 2.41 points. Even though the variable can take values between $-2.5$ and 2.5 and so the increase by one point is relatively massive, also the change by half a point will cause remarkable change in MPTI. In the *democracy*, *autocracy* and *overall polity score* regressions, not only the *de facto exchange rate regime* is significant but also the *GDP per capita* and *past inflation* are. Both of the variables influence the transparency in the assumed way. Coefficient of 0.00 means that the *GDP per capita* is positively correlated to the explained variable but the magnitude of the influence is very low, almost zero. The coefficient on *past inflation* is more challenging to interpret due to the modification carried out but the negative sign has been expected. The reason why *GDP per capita* and *past inflation* are significant specially in these three regressions is due to the strong correlation between the three political variables which originate from their primary definitions.

The significance of the political variables included in the regressions one

at the time can be supported also by Dincer & Eichengreen (2009): *"Greater transparency characterizes central bank operations in countries that rank higher ratings in terms of rule of law, that have more stable political systems, that have higher ratings in terms of voice and accountability, and that are more favorably regarded in terms of government efficiency. Countries with more open (democratic) political systems are also more likely to have transparent central banks..."* The *de facto exchange rate regime* is confirmed to be significant determinant of monetary transparency. In contrast to the results presented in the paper, *GDP per capita* was not significant in *rule of law*, *political stability*, *voice and accountability* and *government efficiency* regressions. *Financial depth* variable is congruently not significant determinant.

In order to conform to the methodology of Dincer & Eichengreen (2009), another set of regressions was performed. At times, interaction term of the *de facto exchange rate regime* variable and the *openness* variable, together with *openness* as the independent variable, was included. Again, seven different regressions were run (Table B.9). Comparing the results to the results without two additional regressors, there is not much difference. The political variables and the *de facto exchange rate regime* remain statistically significant determinants of the Monetary Policy Transparency Index. There is small change to the significance of the *past inflation* as the variable is positively correlated with the transparency also in the *political stability* and *voice and accountability* regressions. The R-squared are slightly higher in the latter regressions which is not surprising as two more variables were added. Looking at the two new variables, few conclusions can be made. Even though the *openness* and *openness*de facto exchange rate regime* are not significantly connected to the dependent variable in all regressions, the F-test for joint significance proved they are jointly significant. The negative signs of the interaction term indicate that greater openness is connected with greater transparency for countries with less flexible exchange rate regimes. This conclusion is in contrast with the findings of Dincer & Eichengreen (2009) who come to the conclusion that greater openness is correlated with greater transparency for countries with more flexible exchange rate regimes.

## 4.3 Analysis of determinants of the dimensions of monetary transparency using averaged data

It is worth to examine the determinants of the various dimensions of the central bank transparency, too. As mentioned above, Geraats (2000) distinguishes 5 dimensions of transparency: political, economic, procedural, policy and operational. For the analysis, regressions analogous to the regressions in the previous subsection were used, only the dependent variable was replaced by the five transparency subindices. For the analysis only the data from years 2007 to 2011 are used as only these data were available. The results, summarized in tables B.11 to B.15, show particular pattern in significance of non-political variables. On the other hand, significance of political variables is diversified.

After closer look at the political transparency determinants, it can be seen that the *de facto exchange rate regime* is positively correlated with the dependent variable in all regressions except *autocracy* and *overall polity score* regressions. All of the political variables are significant determinants of political transparency with expected effect, the highest coefficient having the *rule of law*.

In case of economic transparency the story is different. Economic transparency is a positive function of *rule of law*, *government efficiency*, *democracy* and *overall polity score* and negative function of *autocracy*, leaving the *voice and accountability* variable insignificant. Besides the *de facto exchange rate regime*, also *past inflation* and *GDP per capita* arise as significant determinants of economic transparency. However exchange rate variable is positively associated with the transparency index in *rule of law*, *political stability*, *voice and accountability* and *government efficiency* regressions and income per capita and inflation history variables are significant determinants in the remaining regressions.

Procedural transparency is statistically connected to the least political determinants. In addition to the three strongly correlated variables: *democracy*, *autocracy* and *overall policy score*, also *voice and accountability* shows significant relationship to procedural transparency. The *de facto exchange rate regime* is, as in most of the cases, positively associated with the procedural transparency. Also *GDP per capita* in connection with *autocracy* measure or *overall polity score* influences the investigated dimension of the transparency.

Taking into account the policy transparency (immediate publication of mon-

etary policy decisions, their explanations and policy inclinations), exchange rate variable acquires significant relationship towards this particular dimension of the transparency. This relation was expected. The connection of the policy transparency and the political variables is very similar to the one of political variables and economic transparency. Just the *voice and accountability* is not significantly associated with the individual component of transparency.

The last element of monetary policy transparency to analyze is the operational transparency which pertains to the evaluation of achieving the main monetary policy targets, to the publication of the macroeconomic disturbances and to the evaluation of the monetary policy outcomes. As in the case of policy and economic transparency, the *voice and accountability* variable is not statistically significant at even 10% level of significance. Other political variables are highly significant at 1% level of significance. Again, *the de facto exchange rate regime* is significant in the first three regressions. *GDP per capita* appears to be a significant determinant of operational transparency only at once with the *autocracy* variable.

To summarize, there are remarkable differences in the forces that drive various aspects of the monetary policy transparency and this is in both groups of determinants, the economic and the political, too. This is not very surprising as each of the aspect is linked to other practical element of conducting the monetary policy and performing one of the features is not necessarily conditional on conducting other.

Comparing the results to the results presented by Dincer & Eichengreen (2009) there are some remarkable variations. The most important difference can be seen in the case of *GDP per capita*. Dincer & Eichengreen (2009) conclude that *"...per capita income and exchange rate flexibility are positively associated with each of the five components of the overall index"* which is not our case. Also the role of the *voice and accountability* variable is to some degree dissimilar. The variable is positively correlated with every aspect of the transparency, actually, it is the only political variable with positive impact on the political transparency. The role of the *de facto exchange rate regime* is comparable. The exchange rate variable positively influences all of the dimensions in regressions with every political variable. However in case of political, procedural and policy transparency the coefficient of the variable is larger in the thesis, meaning it has bigger influence on the depended variable.

There is also outstanding contrast in the way political variables determine the dimensions of the monetary policy transparency index. Political trans-

parency is (in the thesis) a function of all the political variables, each of them with highly significant relationship to the political transparency index. The case of the economic transparency is not so different from the one in the paper. Only the *rule of law* variable is extra added to the determinants. The determinants of the procedural transparency are the same in both, the thesis as well as in the paper, except the *government efficiency* which seems to be insignificant in our regressions. The *autocracy* variable is significant in both samples but the coefficient in our regression is higher (respectively lower as the variable has negative impact) by 0.05 points. Other political variables' coefficients earn similar values. As mentioned before, the sole difference in the determinants of policy transparency is the *voice and accountability* that is not significant in our regressions. On the other hand, the coefficients are globally lower indicating lower significance on the policy transparency index. Analyzing the operational transparency the story is very alike in the previous case with the *voice and accountability* variable. The second dissimilarity lies in the *rule of law* that is not significant at even 10% level of significance in Dincer & Eichengreen (2009).

## 4.4 Regressions with panel data

In this section, also the time aspect will be included in the econometric analysis. As stated before, only the data from the period between years 2000 and 2011 are available so for each country we have 12 observations. The principal difference in comparison with the linear regressions using averaged data is that *"the estimates are now driven by the time series variation in the data; they tell us something about why central bank practice is evolving in the direction of greater transparency."* (Dincer & Eichengreen 2009) For studying the relationships between the Monetary Policy Transparency Index and the independent variables, the methodology from chapter 3 will be employed.

Firstly, first differences were used for the estimation of the models. Then, the regression-based test for serial correlation of the disturbances was carried out. In all the regression, the null hypothesis of serial correlation was rejected at even 1% level of significance. As the application of first-differencing method was rejected, the choice laid between the fixed effects and the random effects methods. Each of the regression was estimated using both methods and afterward the Hausman test was applied to decide which of the methods should be used. In all the cases, the null hypothesis was strongly rejected and so fixed

effects method, as the more efficient, is employed in all regressions. The results are summarized in table 4.3.

Table 4.3: Panel data regressions using fixed effects method

| | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| constant | 3.78*** | 3.83*** | 3.78*** | 3.63*** | 3.94*** | 4.31*** | 4.17*** |
| | (0.38) | (0.38) | (0.38) | (0.38) | (0.51) | (0.43) | (0.43) |
| GDP per capita | 0.00*** | 0.00*** | 0.00*** | 0.00*** | 0.00*** | 0.00*** | 0.00*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| past inflation | -2.95 | -3.10 | -3.05 | -2.79 | -4.39 | -4.14 | -4.30 |
| | (2.78) | (2.78) | (2.78) | (2.77) | (4.08) | (4.09) | (4.09) |
| de facto exchange rate regime | -0.01 | -0.01 | -0.01 | -0.00 | -0.06 | -0.06 | -0.06 |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) |
| financial depth | 0.02*** | 0.02*** | 0.02*** | 0.02*** | 0.02*** | 0.02*** | 0.02*** |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| rule of law | 0.35 | | | | | | |
| | (0.33) | | | | | | |
| political stability | | 0.12 | | | | | |
| | | (0.19) | | | | | |
| voice and accountability | | | 0.16 | | | | |
| | | | (0.30) | | | | |
| government efficiency | | | | 0.60** | | | |
| | | | | (0.28) | | | |
| democracy | | | | | 0.06 | | |
| | | | | | (0.05) | | |
| autocracy | | | | | | -0.02 | |
| | | | | | | (0.05) | |
| overall polity score | | | | | | | 0.02 |
| | | | | | | | (0.03) |
| number of observations | 434 | 434 | 434 | 434 | 389 | 394 | 394 |
| overall R-squared | 0.26 | 0.23 | 0.26 | 0.30 | 0.29 | 0.24 | 0.27 |

*Note:* *** significant at the 1% level, ** significant at 5% level, * significant at 10% level, standard errors are in the parentheses

We can see that two economic variables are strongly significant. *Financial depth* and *GDP per capita* are both statistically significant at 1% level of significance with expected positive effects. The coefficients of the *financial depth* variable (rounded to two decimal points) are all around the value of 0.02. This means that growth in the financial depth by 1% increases the Monetary Policy Transparency Index by approximately 0.02 points. This might seems as not very remarkable increase but relatively to the range of the MPTI the difference is notable. The coefficients of *GDP per capita* are generally lower. They are all positive but almost zero which is similar to the linear regressions. The *de facto exchange rate regime* is, contrariwise to the linear estimations, not significant in any of the regressions. Summa summarum, whereas the exchange rate variable is very significant in explaining the basic relationships between economic and political variables and Monetary Policy Transparency Index, after including the time aspect its significance disappears. In other words, the variable helps to explain the differences between the different central banks but it is not helpful in explaining the time variation in the development of the monetary policy transparency in individual countries.

When analyzing the importance of political variables it can be noticed that *government efficiency* arise as the single determinant of the monetary policy transparency. The coefficient of 0.60 points signifies that increase in the government efficiency by 1 point causes increase in the MPT index by more than half a point. The positive correlation between the variable and the transparency of central banks was expected. Other political variables are not significant determinants of the monetary policy. This is the most notable contrast to the linear regression analysis where all of the political variables were statistically significant in explaining the Monetary Policy Transparency Index when we included them one at a time.

Not only are the political variables more significant in the linear regressions but also there is difference in comparison with the paper. Except the *government efficiency*, also the *rule of law* and the *political stability* help to explain time variation in the monetary policy. Dincer & Eichengreen (2009) explain why the political variables are good instrumental variables, i.e. why there is exogeneity and at the same the correlation with the explanatory variable. The explanation is as follows: *"...while it is not hard to come up with an argument for why the transparency of monetary policy should affect inflation, financial markets, or the development of trade, it is harder to concoct a story for why it should have a first-order effect on, say, rule of law, which depends on the larger*

*political and social setting and is the product of a country's history."*

As in the linear models, a set of regressions including interaction term *openness*de facto exchange rate regime* was run (Table B.16). The variable of interest - the interaction term - has approximately the same coefficient as in the paper, around 0.00. This indicates the variable, even though it is significant, has very low impact on the explanatory variable.

## 4.5 Monetary Policy Transparency and Price Stability

The price stability is not researched independently but rather as a part of all the regressions. The price stability is represented by the *past inflation* variable. Consumer Price Index was used as a measure of inflation. There were some modification done to the CPI. Firstly, logarithms of the values were calculated. This operation is usually done with the data that take on positive dollar amount (Wooldridge 2002). The values were then first-differenced. This was done in order to calculate the year-to-year changes. Taking lagged values was so as to capture the assumption that inflation from the previous year has effect on the monetary policy transparency in current year.

Generally, the *past inflation* variable is not significantly connected to the dependent variable. In the regressions in which it is the coefficients are all almost zero (rounded to two decimal places). This means that even if the *past inflation* is correlated to the Monetary Policy Transparency Index it has very small effect.

# Chapter 5

# Conclusion

The main field of study of the thesis was monetary policy transparency. The work closely followed the methodology of Dincer & Eichengreen (2009) and employed the Monetary Policy Transparency Index in order to conduct all the calculations and analyses. The main contribution of the work was the update of the results presented in the paper up until the year 2011.

The goal of the work was to confirm or question findings presented in the paper. This work should, via the updated data, provide information whether the trends in the monetary policy transparency discovered in the data until the year 2006 last also for the following five years.

First of the assumptions was that the overall level of monetary policy transparency over time grows. Using averaged data, this can be concluded also for the period not originally studied in the paper. The increase in the central bank transparency in year 2011 can be noted compared to the year 2006 and also to the year 2000 when our analysis begins. The next discovery of absence of countries with decrease in the score of MPTI can not be confirmed to full extend. We found three countries with decreased score in the year 2011. This amount is not considerably large but this discovery can offer evidence that the move towards lower level of transparency can occur. As to the central bank transparency in countries divided according to the level of economic development, the results from the period followed in the thesis and the period followed in the paper are considerably similar. The data prove that countries classified as advanced countries are generally more transparent about their monetary policy than the countries classified as the emerging and developing countries. The level of the transparency compared in countries divided according to the monetary policy framework they adopt was not researched in the paper. How-

ever, as stated by Geraats (2006), inflation targeters are generally the most transparent. This conclusion can also be supported by the findings presented in this work. Studying the individual aspects of the transparency, political transparency appears to be the most common field of transparency conducted by the central banks in both compared years (2006 and 2011).

Using linear regressions we were able to find determinants of the monetary policy transparency. The *de facto exchange rate regime* appears to be significant as the only economic variable in all linear regressions. The significance and the positive relationship with the Monetary Policy Transparency Index support the conclusions made in the paper. The role of the political variables also remains the same in both discussed time periods. All political variables are significantly correlated to the dependent variable with the expected sign (all positive except the *autocracy* variable that was correlated negatively).The linear regressions were also employed to study the individual aspects of the monetary policy. Investigating the political, economic, procedural, policy and operational transparencies we found more differences from the paper. The most remarkable difference can be seen in the case of the *GDP per capita*. In contrast to the regressions from the paper, this variable is not significant determinate of the MPT Index in our regressions. This indicates that forces driving the individual aspects of the monetary policy changed in the period examined in the thesis in comparison with the period examined by Dincer & Eichengreen (2009)

Next, the panel data methods were used to find the influences that are behind the time variation in the level of monetary policy in individual central banks. Concerning economic variables the *de facto exchange rate regime* variable is not significantly correlated to the explained variable whereas the *GDP per capita* and the *financial depth* are. As to the political variables, not all of them have significant impact on the monetary policy transparency. Only the *government efficiency* variable seems to have statistically significant influence on the MPT Index. There arises notable difference to the results submitted in Dincer & Eichengreen (2009). In the paper more political variables are significant, namely also the *rule of law* and the *political stability*.

Globally it can be concluded that most of the trends discovered in Dincer & Eichengreen (2009) are in line with the results the thesis came to. There are some differences in the outcomes, however, these can be caused by the different source of the data set used in the thesis.

The possible expansion of the work could by the update of the third - last -

part of the paper in which the authors investigate the effects of the monetary policy transparency. In this part the Monetary Policy Transparency Index is treated as one of the explanatory variables. Two dependent variables are under investigation: inflation persistence and inflation variability. Both of them more closely investigate the relationship between the monetary policy transparency and price stability.

# Bibliography

(2012): "World economic outlook: Coping with high debt and sluggish growth." online [http://www.imf.org/external/pubs/ft/weo/2012/02/pdf/text.pdf].

Aguilar, G. H. (2010): "What drives inflation expectations in guatemala, and what do they imply for monetary policy decisions?" online, http://www3.bcu.gub.uy/autoriza/peiees/jor/2010/iees03j3451010.pdf.

Alichi, A., K. Clinton, J. Dagher, O. Kamenik, D. Laxton, & M. Mills (2009): "A model for full-fledged inflation targeting and application to ghana." online, http://www.imf.org/external/pubs/ft/wp/2010/wp1025.pdf.

Banaian, K., D. M. Kemme, & G. Sargsyan (2008): "Inflation targeting in armenia: Monetary policy in transition." *Comparative Economic Studies* **(50)**: pp. 421–437.

Crowe, C. & E. E. Meade (2008): "Central bank independence and transparency: Evolution and effectivness." online[http://www.imf.org/external/pubs/ft/wp/2008/wp08119.pdf], International Monetary Fund.

Debelle, G., P. Masson, M. Savastano, & S. Sharma (1998): "Inflation targeting as a framework for monetary policy." *Economic Issues* **(15)**.

Dincer, N. & B. Eichengreen (2009): "Central bank transparency: Causes, consequences and updates." National Bureau of Economic Research, online [http://www.nber.org/papers/w14791.pdf].

Eijffinger, S. C. & P. M. Geraats (2006): "How transparent are central banks?" *European Journal of Political Economy* **22**: p. 21.

Filáček, J., L. Komárek, & P. Král (2007): "Why central bankers should disclose interest rate forecast." *Czech Journal of Economics and Finance* **57(11-12)**.

Franta, M., J. Baruník, R. Horváth, & K. Šmídková (2011): "Are bayesian fan charts useful for central banks? uncertainty, forecasting, and financial stability stress tests." online [http://www.cnb.cz/en/research/research_publications/cnb_wp/download/cnbwp_2011_10.pdf].

Geraats, P. M. (2000): "Why adopt transparency? the publication of central bank forecasts." online[http://escholarship.org/uc/item/0hw7h7cp], University of California, Berkeley.

Geraats, P. M. (2002): "Central bank transparency." online, http://www.wm.tu-berlin.de/fileadmin/fg124/geldtheorie/literatur/geraats.pdf.

Geraats, P. M. (2006): "Transparency of monetary policy: Theory and practice." *CESifo Economic Studies* **52**: p. 32.

Horváth, R. & D. Vaško (2013): "Central bank transparency and financial stability." FIW Working Paper No. 113.

Inoue, T., Y. Toyoshima, & S. Hamori (2012): "Inflation targeting in korea, indonesia, the philippines, and thailand: The impact on business cycle synchronization between each country and the world." online, http://ir.ide.go.jp/dspace/bitstream/2344/1117/1/ARRIDE_Discussion_No.328_inoue.pdf.

Kuran, T. (1986): "The economic system in contemporary islamic thought: Interpretation and assesment." *International Journal of Middle East Studies* **18(2)**: pp. 136–164.

Marshall, M. G., K. Jaggers, & T. R. Gurr (2011): "Polity iv project: Dataset users' manual." *Technical report*, Center for Systemic Peace.

Martínez, G. O. (2008): "Inflation targeting." online, http://www.imf.org/external/np/seminars/eng/2011/res/pdf/go2.pdf.

Neuenkirch, M. (2012): "Managing financial market expectations: The role of central bank transparency and central bank communication." *European Journal of Political Economy* **28(1-13)**: p. 13.

of Serbia, N. B. (2008): "Memorandum of the national bank of serbia on inflation targeting as monetary strategy." online,

http://www.nbs.rs/export/sites/default/internet/english/30/Memorandum_monetarna_strategija_122008_eng.pdf.

Tanasie, A. (2009): "A brief evaluation of inflation targeting in romania envisaging the euro adoption." online, http://feaa.ucv.ro/AUCSSE/0038v1-0019.pdf.

Wooldridge, J. M. (2002): *Introductory Econometrics - A Modern Approach*. South-Western, 2nd revised edition edition edition.

# Appendix A

# Structure of indices

## A.1 Monetary policy transparency index

Here, I offer overview of the 15 questions used by Eijffinger and Geraats (2006) used to calculate the monetary policy transparency index. The maximum score is 15 points.

1. **Political transparency**
   Political transparency refers to openness about policy objectives. This comprises a formal statement of objectives, including an explicit prioritization in case of multiple goals, a quantification of the primary objective(s), and explicit institutional arrangements.

   (a) Is there a formal statement of the objective(s) of monetary policy, with an explicit prioritization in case of multiple objectives?
   No formal objective(s) = 0.
   Multiple objectives without prioritization = 1/2.
   One primary objective, or multiple objectives with explicit priority = 1.

   (b) Is there a quantification of the primary objective(s)?
   No = 0.
   Yes = 1.

   (c) Are there explicit contacts or other similar institutional arrangements between the monetary authorities and the government?
   No central bank contracts or other institutional arrangements = 0.
   Central bank without explicit instrument independence or

contract = 1/2.
Central bank with explicit instrument independence or central bank contract although possibly subject to an explicit override procedure = 1.

2. **Economic Transparency**
Economic transparency focuses on the economic information that is used for monetary policy. This includes economic data, the model of the economy that the central bank employs to construct forecasts or evaluate the impact of its decisions, and the internal forecasts (model based or judgmental) that the central bank relies on.

(a) Is the basic economic data relevant for the conduct of monetary policy publicly available? (The focus is on the following five variables: money supply, inflation, GDP, unemployment rate and capacity utilization.)
Quarterly time series for at most two out of the five variables = 0.
Quarterly time series for three or four out of the five variables = 1/2.
Quarterly time series for all five variables = 1.

(b) Does the central bank disclose the macroeconomic model(s) it uses for policy analysis?
No = 0.
Yes = 1.

(c) Does the central bank regularly publish its own macroeconomic forecasts?
No numerical central bank forecasts for inflation and output = 0.
Numerical central bank forecasts for inflation and/or output published at less than quarterly frequency = 1/2.
Quarterly numerical central bank forecasts for inflation and output for the medium term (one to two years ahead), specifying the assumptions about the policy instrument (conditional or unconditional forecasts) = 1.

3. **Procedural Transparency** Procedural transparency is about the way monetary policy decisions are taken.

(a) Does the central bank provide an explicit policy rule or strategy that

describes its monetary policy framework?
No = 0.
Yes = 1.

(b) Does the central bank give a comprehensive account of policy deliberations (or explanations in case of a single central banker) within a reasonable amount of time?
No or only after a substantial lag (more than eight weeks) = 0.
Yes, comprehensive minutes (although not necessarily verbatim or attributed) or explanations (in case of a single central banker), including a discussion of backward and forward-looking arguments = 1.

(c) Does the central bank disclose how each decision on the level of its main operating instrument or target was reached?
No voting records, or only after substantial lag (more than eight weeks) = 0.
Non-attributed voting records = 1/2.
Individual voting records, or decision by single central banker = 1.

4. **Policy transparency** Policy transparency means prompt disclosure of policy decisions, together with an explanation of the decision, and an explicit policy inclination or indication of likely future policy actions.

(a) Are decisions about adjustments to the main operating instrument or target announced promptly?
No or only after the day of implementation = 0.
Yes, on the day of implementation = 1.

(b) Does the central bank provide an explanation when it announces policy decisions?
No = 0.
Yes, when policy decisions change, or only superficially = 1/2.
Yes, always and including forwarding-looking assessments = 1.

(c) Does the central bank disclose an explicit policy inclination after every policy meeting or an explicit indication of likely future policy actions

(at least quarterly)?
No = 0.
Yes = 1.

5. **Operational Transparency**
   Operational transparency concerns the implementation of the central bank's policy actions. It involves a discussion of control errors in achieving operating targets and (unanticipated) macroeconomic disturbances that affect the transmission of monetary policy. Furthermore, the evaluation of the macroeconomic outcomes of monetary policy in light of its objectives is included here as well.

   (a) Does the central bank regularly evaluate to what extent its main policy operating targets (if any) have been achieved?
   No or not very often (at less than annual frequency) = 0.
   Yes but without providing explanations for significant deviations = 1/2.
   Yes, accounting for significant deviations from target (if any); or, (nearly) perfect control over main operating instrument/target = 1.

   (b) Does the central bank regularly provide information on (unanticipated) macroeconomic disturbances that affect the policy transmission process?
   No or not very often = 0.
   Yes but only through short-term forecasts or analysis of current macroeconomic developments (at least quarterly) = 1/2.
   Yes including a discussion of past forecast errors (at least annually) = 1.

   (c) Does the central bank regularly provide an evaluation of the policy outcome in light of its macroeconomic objectives?
   No or not very often (at less than annual frequency) = 0.
   Yes but superficially = 1/2.
   Yes, with an explicit account of the contribution of monetary policy in meeting the objectives = 1.

## A.2 Construction of democracy variable

Table A.1: Construction of *democracy* variable

| **Authority Coding** | **Scale Weight** |
|---|---|
| Competitiveness of Executive Recruitment | |
| (3) Election | +2 |
| (2) Transitional | +1 |
| | |
| Openness of Executive Recruitment<br>only if Competitiveness of Executive Recruitment is Election (3) or Transitional (2) | |
| (3) Dual/election | +1 |
| (4) Election | +1 |
| | |
| Constraint on Chief Executive | |
| (7) Executive parity or subordination | +4 |
| (6) Intermediate category | +3 |
| (5) Substantial limitations | +2 |
| (4) Intermediate category | +1 |
| | |
| Competitiveness of Political Participation | |
| (5) Competitive | +3 |
| (4) Transitional | +2 |
| (3) Factional | +1 |

*Source:* Marshall *et al.* (2011)

## A.3 Construction of autocracy variable

Table A.2: Construction of *autocracy* variable

| **Authority Coding** | **Scale Weight** |
|---|---|
| Competitiveness of Executive Recruitment | |
| (1) Selection | +2 |
| | |
| Openness of Executive Recruitment | |
| only if Competitiveness of Executive Recruitment is coded Selection (1) | |
| (1) Closed | +1 |
| (2) Dual/designation | +1 |
| | |
| Constraints on Chief Executive | |
| (1) Unlimited authority | +3 |
| (2) Intermediate category | +2 |
| (3) Slight to moderate limitations | +1 |
| | |
| Regulation of participation | |
| (4) Restricted | +2 |
| (3) Sectarian | +1 |
| | |
| Competitiveness of Participation | |
| (1) Repressed | +2 |
| (2) Suppressed | +1 |

*Source:* Marshall *et al.* (2011)

# Appendix B

# Empirical results summary

## B.1 Meaning of the shortcuts

MPTI Monetary Policy Transparency Index
GDPPC GDP per capita
PINFL past inflation
EXR the de facto exchange rate regime
DEPTH financial depth
DEM democracy
AUT autocracy
POL overall polity score
STAB political stability
LAW rule of law
VAA voice and accountability
EFF government efficiency

## B.2 Tables

Table B.1: Monetary Policy Transparency Index score in all countries

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Africa** | 2.32 | 2.76 | 3.06 | 3.24 | 3.29 | 3.62 | 3.68 | 3.91 | 4.06 | 4.15 | 4.24 | 4.65 |
| **Eastern Africa** | 1.93 | 2.43 | 2.64 | 2.64 | 2.64 | 2.79 | 2.86 | 3.00 | 3.29 | 3.36 | 3.43 | 3.93 |
| Ethiopia | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Kenya | 2.5 | 4 | 4 | 4 | 4 | 4 | 5.5 | 5.5 | 5.5 | 6 | 6 | 6 |
| Malawi | 0.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Mauritius | 4 | 4 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Rwanda | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.5 | 1.5 | 1.5 | 2.5 | 2.5 | 2.5 | 3 |
| Uganda | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 5.5 |
| Zambia | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.5 | 2.5 | 3 | 3 |
| **Northern Africa** | 1.63 | 1.63 | 2.00 | 2.13 | 2.13 | 2.38 | 2.50 | 2.88 | 3.00 | 3.00 | 3.00 | 3.00 |
| Egypt | 1 | 1 | 1 | 1.5 | 1.5 | 2.5 | 2.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Libyan Arab Jamahirya | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Sudan | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2.5 | 3 | 3 | 3 | 3 |
| Tunisia | 2.5 | 2.5 | 4 | 4 | 4 | 4 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| **Southern Africa** | 3.83 | 5.00 | 5.33 | 5.67 | 6.00 | 7.17 | 7.17 | 7.50 | 7.50 | 7.83 | 7.83 | 8.33 |
| Lesotho | 1.5 | 1.5 | 1.5 | 2.5 | 2.5 | 4.5 | 4.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| Namibia | 4.5 | 4.5 | 5.5 | 5.5 | 6.5 | 8 | 8 | 8 | 8 | 9 | 9 | 9 |
| South Africa | 5.5 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10.5 |
| **Western Africa** | 2.67 | 2.83 | 3.17 | 3.67 | 3.67 | 3.67 | 3.67 | 3.83 | 3.83 | 3.83 | 4.17 | 4.83 |
| Ghana | 3 | 3 | 4 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 6.5 | 6.5 |
| Nigeria | 3.5 | 4 | 4 | 4 | 4 | 4 | 4 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Sierra Leone | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 3.5 |

Table B.2: Monetary Policy Transparency Index score in all countries cont.

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Americas** | 4.18 | 4.43 | 4.68 | 4.85 | 5.20 | 5.20 | 5.10 | 5.68 | 5.85 | 5.93 | 5.93 | 5.93 |
| **Latin America and the Caribbean** | 5.07 | 5.29 | 5.57 | 5.93 | 6.07 | 6.07 | 5.71 | 6.79 | 7.00 | 7.14 | 7.14 | 7.14 |
| **East Caribbean** | 2.83 | 3.08 | 3.58 | 3.67 | 3.92 | 3.92 | 3.75 | 4.08 | 4.25 | 4.25 | 4.25 | 4.25 |
| Aruba | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Bahamas | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Barbados | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Cuba | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2 | 2 | 2 | 2 | 2 |
| Jamaica | 3 | 4.5 | 6.5 | 6.5 | 6.5 | 6.5 | 5.5 | 6 | 7 | 7 | 7 | 7 |
| Trinidad and Tobago | 3.5 | 3.5 | 3.5 | 4 | 5.5 | 5.5 | 5.5 | 6 | 6 | 6 | 6 | 6 |
| Central America | 2.38 | 2.88 | 2.88 | 3.00 | 4.00 | 4.00 | 4.38 | 4.88 | 4.88 | 5.00 | 5.00 | 5.00 |
| Belize | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 |
| El Salvador | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Guatemala | 1.5 | 1.5 | 1.5 | 1.5 | 4.5 | 4.5 | 6 | 7 | 7 | 7 | 7 | 7 |
| Mexico | 4 | 4 | 4 | 4.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 6 | 6 | 6 |
| **South America** | 5.07 | 5.29 | 5.57 | 5.93 | 6.07 | 6.07 | 5.71 | 6.79 | 7.00 | 7.14 | 7.14 | 7.14 |
| Argentina | 2 | 2 | 2 | 4.5 | 5.5 | 5.5 | 5.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Brazil | 9 | 9 | 9 | 9 | 9 | 9 | 7.5 | 8 | 8 | 8 | 8 | 8 |
| Chile | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 |
| Colombia | 5.5 | 5.5 | 6 | 6 | 6 | 6 | 5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 |
| Guyana | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 |
| Peru | 5 | 6.5 | 8 | 8 | 8 | 8 | 8 | 8 | 9.5 | 10 | 10 | 10 |
| Uruguay | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6.5 | 6.5 | 6.5 |

Table B.3: Monetary Policy Transparency Index score in all countries cont.

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Northern America** | 7.17 | 7.17 | 7.17 | 7.17 | 7.33 | 7.33 | 7.33 | 7.33 | 7.67 | 7.67 | 7.67 | 7.67 |
| Bermuda | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Canada | 10.5 | 10.5 | 10.5 | 10.5 | 11 | 11 | 11 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 |
| United States of America | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10.5 | 11.5 | 11.5 | 11.5 | 11.5 |
| **Oceania** | 5.57 | 6.18 | 6.57 | 6.57 | 6.86 | 6.86 | 6.86 | 7.50 | 7.50 | 7.57 | 7.64 | 7.64 |
| **Australia and New Zealand** | 10.5 | 10.75 | 11.5 | 11.5 | 11.5 | 11.5 | 11.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 |
| Australia | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 |
| New Zealand | 13 | 13.5 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 |
| **Melanesia** | 1.88 | 2.75 | 2.88 | 2.88 | 3.38 | 3.38 | 3.38 | 3.75 | 3.75 | 3.88 | 4.00 | 4.00 |
| Fiji | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 |
| Papua New Guinea | 1 | 3.5 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5.5 | 5.5 |
| Solomon Islands | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1.5 | 1.5 | 1.5 |
| Vanuatu | 1.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 3 | 3 | 4 | 4 | 4 |
| **Asia** | 3.39 | 3.61 | 4.03 | 4.32 | 4.56 | 4.68 | 4.82 | 5.45 | 5.58 | 5.69 | 5.76 | 5.84 |
| **Central Asia** | 2.67 | 3.00 | 3.00 | 2.67 | 3.33 | 4.00 | 4.00 | 4.67 | 4.83 | 5.00 | 5.00 | 5.00 |
| Kazakhstan | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 5.5 | 5.5 | 6 | 6 | 6 | 6 | 6 |
| Kyrgyzstan | 3 | 4 | 4 | 3 | 5 | 5 | 5 | 5.5 | 5.5 | 6 | 6 | 6 |
| Tajikistan | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.5 | 3 | 3 | 3 | 3 |
| **Eastern Asia** | 5.2 | 5.2 | 5.7 | 6.3 | 6.6 | 6.6 | 6.7 | 7.5 | 7.6 | 7.8 | 8 | 8 |
| China | 1 | 1 | 1.5 | 4.5 | 4.5 | 4.5 | 4.5 | 5 | 5 | 5 | 5 | 5 |
| Hong Kong | 6 | 6 | 7 | 7 | 7 | 7 | 7.5 | 8.5 | 9 | 9 | 9 | 9 |
| Japan | 8.5 | 8 | 8 | 8 | 9.5 | 9.5 | 9.5 | 10 | 10 | 11 | 11 | 11 |
| Korea | 8 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 9.5 | 9.5 | 9.5 | 10.5 | 10.5 |
| Mongolia | 2.5 | 2.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |

Table B.4: Monetary Policy Transparency Index score in all countries cont.

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Southern Asia** | 2.2 | 2.3 | 2.9 | 3.4 | 3.8 | 3.8 | 3.9 | 4.2 | 4.2 | 4.2 | 4.2 | 4.7 |
| Bangladesh | 0 | 0.5 | 0.5 | 3 | 3.5 | 3.5 | 3.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Bhutan | 1.5 | 1.5 | 3 | 3 | 3 | 3 | 3 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| India | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| Pakistan | 2.5 | 2.5 | 2.5 | 2.5 | 3.5 | 3.5 | 4 | 4 | 4 | 4 | 4 | 4 |
| Sri Lanka | 5 | 5 | 6.5 | 6.5 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 8.5 |
| **South-Eastern Asia** | 5 | 5.6 | 6.5 | 7.2 | 7.4 | 7.6 | 7.7 | 8.2 | 8.2 | 8.4 | 8.4 | 8.4 |
| Indonesia | 4.5 | 4.5 | 4.5 | 7 | 8 | 8 | 8.5 | 9 | 9 | 10 | 10 | 10 |
| Malaysia | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Philippines | 5 | 6 | 10 | 10 | 10 | 10 | 10 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 |
| Singapore | 4 | 5.5 | 4.5 | 5.5 | 5.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Thailand | 6 | 6.5 | 8 | 8 | 8 | 8 | 8 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 |
| **Western Asia** | 2.7 | 2.9 | 3.1 | 3.2 | 3.3 | 3.3 | 3.5 | 4.3 | 4.5 | 4.6 | 4.7 | 4.7 |
| Armenia | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Bahrain | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 |
| Georgia | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 6 | 9 | 9 | 9 | 9 |
| Iraq | 2 | 2 | 2 | 2 | 2.5 | 2.5 | 2.5 | 3 | 3 | 3 | 3 | 3 |
| Israel | 7.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 10 | 11 | 11 | 11 | 11 | 11 |
| Jordan | 1 | 1 | 1 | 1 | 1.5 | 2 | 2 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Kuwait | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Oman | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Qatar | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 |
| Saudi Arabia | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Turkey | 4 | 5.5 | 8.5 | 8.5 | 8.5 | 8.5 | 10 | 10 | 10 | 10 | 11 | 11 |
| United Arab Emirates | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Yemen | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |

Table B.5: Monetary Policy Transparency Index score in all countries cont.

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Europe** | 5.54 | 5.85 | 6.52 | 6.77 | 7.02 | 7.21 | 7.38 | 8.19 | 8.21 | 8.27 | 8.46 | 8.75 |
| **Eastern Europe** | 4.30 | 4.55 | 5.50 | 5.60 | 6.00 | 6.35 | 6.75 | 7.50 | 7.55 | 7.60 | 7.90 | 8.10 |
| Belarus | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 |
| Bulgaria | 4.5 | 4.5 | 4.5 | 4.5 | 5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| Czech Republic | 9.5 | 9.5 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 11.5 | 11.5 | 11.5 |
| Hungary | 5 | 6 | 8.5 | 8.5 | 8.5 | 10 | 10.5 | 11.5 | 11.5 | 11.5 | 11.5 | 11.5 |
| Poland | 5 | 6.5 | 6.5 | 6.5 | 7 | 8 | 9 | 10.5 | 10.5 | 10.5 | 10.5 | 11 |
| Republic of Moldova | 4.5 | 5.5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 8 | 9 |
| Romania | 1.5 | 1.5 | 4.5 | 4.5 | 6.5 | 6.5 | 7 | 7.5 | 7.5 | 7.5 | 7.5 | 8 |
| Russian Federation | 1.5 | 1.5 | 1.5 | 1.5 | 2.5 | 2.5 | 2.5 | 3 | 3 | 3 | 4.5 | 4.5 |
| Slovakia | 4.5 | 3.5 | 5.5 | 5.5 | 5.5 | 6 | 8 | 11 | 11 | 11 | 11 | 11 |
| Ukraine | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 3.5 | 3 | 3 |
| **Northern Europe** | 7.19 | 7.44 | 7.88 | 8.00 | 8.00 | 8.13 | 8.25 | 8.56 | 8.56 | 8.69 | 8.69 | 9.31 |
| Denmark | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Estonia | 5.5 | 5.5 | 5.5 | 5.5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 11 |
| Iceland | 7 | 7 | 7.5 | 7.5 | 7.5 | 7.5 | 8 | 8 | 8 | 9 | 9 | 9 |
| Latvia | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lithuania | 4 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 5 | 6 | 6 | 6 | 6 | 6 |
| Norway | 6 | 7.5 | 7.5 | 7.5 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 |
| Sweden | 11.5 | 11.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 |
| United Kingdom | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 |

Table B.6: Monetary Policy Transparency Index score in all countries cont.

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Southern Europe** | 4.13 | 4.38 | 5.00 | 5.75 | 6.00 | 6.00 | 5.75 | 8.13 | 8.13 | 8.13 | 8.13 | 8.13 |
| Albania | 4.5 | 4.5 | 4.5 | 6 | 7 | 7 | 6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| Croatia | 1.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 3 | 3 | 3 | 3 | 3 |
| Malta | 5.5 | 5.5 | 5.5 | 7 | 7 | 7 | 7 | 11 | 11 | 11 | 11 | 11 |
| Slovenia | 5 | 5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 11 | 11 | 11 | 11 | 11 |
| **Western Europe** | 8.43 | 9.87 | 10.33 | 10.40 | 10.90 | 10.90 | 10.90 | 10.90 | 10.91 | 10.91 | 11.00 | 11.00 |
| Eurozone | 8.5 | 10 | 10.5 | 10.5 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| Switzerland | 7.5 | 8 | 8 | 9 | 9.5 | 9.5 | 9.5 | 9.5 | 9.5 | 9.5 | 11 | 11 |

Table B.7: Monetary Policy Transparency Index in regions using GDP-weighted averages

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Africa** | 3.09 | 4.26 | 4.44 | 5.11 | 5.34 | 5.41 | 5.25 | 5.39 | 5.11 | 5.28 | 5.73 | 6.37 |
| Eastern Africa | 2.14 | 2.73 | 2.93 | 2.96 | 2.91 | 2.86 | 3.21 | 3.31 | 3.38 | 3.43 | 3.56 | 3.97 |
| Northern Africa | 1.27 | 1.29 | 1.58 | 1.93 | 1.94 | 2.34 | 2.36 | 2.85 | 2.89 | 3.10 | 3.54 | 3.54 |
| Southern Africa | 5.45 | 8.83 | 8.86 | 8.87 | 8.89 | 8.95 | 8.95 | 8.95 | 8.95 | 8.98 | 8.98 | 10.43 |
| Western Africa | 3.43 | 3.86 | 3.96 | 4.12 | 4.11 | 4.10 | 4.16 | 4.60 | 4.60 | 4.60 | 4.72 | 4.77 |
| **Americas** | 9.38 | 9.39 | 9.51 | 9.55 | 9.63 | 9.61 | 9.48 | 9.87 | 10.55 | 10.67 | 10.55 | 10.49 |
| East Caribbean | 2.89 | 3.12 | 3.47 | 3.60 | 3.87 | 3.90 | 3.68 | 3.59 | 3.82 | 5.88 | 5.90 | 5.94 |
| Central America | 3.88 | 3.91 | 3.90 | 4.38 | 5.42 | 5.42 | 5.47 | 5.50 | 5.50 | 5.97 | 5.98 | 5.98 |
| South America | 6.66 | 6.61 | 7.55 | 7.82 | 7.96 | 8.01 | 7.01 | 7.88 | 7.94 | 7.98 | 7.98 | 7.97 |
| Northern America | 10.03 | 10.03 | 10.03 | 10.03 | 10.07 | 10.08 | 10.08 | 10.50 | 11.40 | 11.41 | 11.40 | 11.40 |
| **Oceania** | 8.47 | 8.61 | 9.64 | 9.71 | 9.66 | 9.65 | 9.58 | 10.62 | 10.49 | 10.50 | 10.49 | 10.46 |
| Australia and New Zealand | 8.55 | 8.67 | 9.71 | 9.78 | 9.72 | 9.70 | 9.64 | 10.68 | 10.55 | 10.56 | 10.55 | 10.52 |
| Melanesia | 1.67 | 3.19 | 3.46 | 3.47 | 4.36 | 4.40 | 4.42 | 4.74 | 4.76 | 4.78 | 5.12 | 5.15 |
| **Asia** | 6.18 | 5.82 | 5.93 | 6.51 | 7.15 | 6.97 | 6.86 | 7.17 | 7.05 | 7.39 | 7.38 | 7.22 |
| Central Asia | 3.38 | 3.44 | 3.44 | 3.38 | 3.48 | 5.33 | 5.35 | 5.87 | 5.87 | 5.88 | 5.89 | 5.90 |
| Eastern Asia | 7.04 | 6.48 | 6.49 | 7.17 | 8.05 | 7.90 | 7.68 | 7.99 | 7.78 | 8.14 | 8.11 | 7.91 |
| Southern Asia | 1.99 | 2.02 | 2.06 | 2.23 | 2.37 | 2.37 | 2.42 | 3.23 | 3.27 | 3.26 | 3.24 | 3.32 |
| South- Eastern Asia | 4.98 | 5.49 | 6.17 | 7.13 | 7.46 | 7.59 | 7.81 | 8.32 | 8.36 | 8.79 | 8.82 | 8.84 |
| Western Asia | 3.27 | 3.79 | 4.66 | 4.85 | 4.87 | 4.78 | 5.29 | 5.63 | 5.44 | 5.65 | 5.97 | 5.61 |
| **Europe** | 8.70 | 9.71 | 10.15 | 10.19 | 10.55 | 10.47 | 10.40 | 10.44 | 10.30 | 10.41 | 10.46 | 10.41 |
| Eastern Europe | 3.65 | 4.00 | 4.55 | 4.58 | 5.06 | 5.24 | 5.33 | 5.96 | 5.90 | 6.17 | 6.70 | 6.64 |
| Northern Europe | 11.17 | 11.28 | 11.60 | 11.66 | 11.71 | 11.66 | 11.64 | 11.74 | 11.61 | 11.59 | 11.62 | 11.65 |
| Southern Europe | 3.47 | 3.88 | 4.85 | 5.05 | 5.09 | 5.06 | 4.95 | 6.90 | 6.87 | 6.89 | 6.91 | 6.93 |
| Western Europe | 8.46 | 9.92 | 10.40 | 10.44 | 10.94 | 10.95 | 10.95 | 10.95 | 10.94 | 10.94 | 11.00 | 11.00 |

Table B.8: Correlation matrix of variables using averaged data

| | MPTI | GDPPC | PINFL | EXR | DEPTH | DEM | AUT | POL | STAB | LAW | VAA | EFF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MPTI | 1.00 | | | | | | | | | | | |
| GDPPC | 0.47 | 1.00 | | | | | | | | | | |
| PINFL | -0.35 | -0.49 | 1.00 | | | | | | | | | |
| EXR | 0.41 | 0.08 | 0.11 | 1.00 | | | | | | | | |
| DEPTH | 0.43 | 0.51 | -0.52 | 0.10 | 1.00 | | | | | | | |
| DEM | 0.66 | 0.23 | -0.14 | 0.27 | 0.21 | 1.00 | | | | | | |
| AUT | -0.50 | 0.08 | -0.06 | -0.40 | -0.05 | -0.85 | 1.00 | | | | | |
| POL | 0.63 | 0.11 | -0.06 | 0.34 | 0.15 | 0.97 | -0.95 | 1.00 | | | | |
| STAB | 0.36 | 0.59 | -0.49 | -0.21 | 0.36 | 0.33 | -0.04 | 0.21 | 1.00 | | | |
| LAW | 0.62 | 0.80 | -0.57 | 0.05 | 0.62 | 0.41 | -0.10 | 0.30 | 0.75 | 1.00 | | |
| VAA | 0.74 | 0.54 | -0.35 | 0.21 | 0.39 | 0.87 | -0.67 | 0.82 | 0.60 | 0.72 | 1.00 | |
| EFF | 0.69 | 0.79 | -0.60 | 0.12 | 0.63 | 0.46 | -0.19 | 0.37 | 0.69 | 0.96 | 0.75 | 1.00 |

Table B.9: Monetary policy transparency index regression analysis with averaged data including interaction term

| | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| constant | 2.13* | 0.88 | 1.36 | 2.76** | -2.38 | 1.58 | -0.52 |
| | (1.25) | (1.37) | (1.12) | (1.19) | (1.91) | (2.03) | (1.90) |
| past inflation | -26.63 | -33.24* | -29.79* | -14.70 | -33.29* | -38.09** | -34.84** |
| | (18.22) | (19.84) | (16.36) | (17.37) | (17.02) | (18.24) | (17.23) |
| de facto ER regime | 0.92*** | 1.01*** | 0.87*** | 0.73*** | 0.90*** | 0.83** | 0.83*** |
| | (0.23) | (0.26) | (0.21) | (0.22) | (0.30) | (0.32) | (0.31) |
| Openness | 0.03 | 0.02 | 0.04* | 0.01 | 0.06* | 0.06 | 0.06* |
| | (0.02) | (0.02) | (0.02) | (0.02) | (0.03) | (0.03) | (0.03) |
| Openness*De facto ER regime | -0.01 | -0.01 | -0.01* | -0.01 | -0.01* | -0.01* | -0.01 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.01) | (0.01) | (0.01) |
| financial depth | -0.00 | 0.01 | -0.00 | -0.00 | 0.01 | 0.01 | 0.01 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| GDP per capita | -0.00 | 0.00 | 0.00 | -0.00* | 0.00** | 0.00*** | 0.00*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| rule of law | 2.36*** | | | | | | |
| | (0.49) | | | | | | |
| political stability | | 1.03** | | | | | |
| | | (0.40) | | | | | |
| voice and accountability | | | 2.04*** | | | | |
| | | | (0.30) | | | | |
| government efficiency | | | | 2.91*** | | | |
| | | | | (0.48) | | | |
| democracy | | | | | 0.46*** | | |
| | | | | | (0.07) | | |

Table B.10: Monetary policy transparency index regression analysis with averaged data including interaction term cont.

| | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| autocracy | | | | | | -0.58*** | |
| | | | | | | (0.10) | |
| overall polity score | | | | | | | 0.28*** |
| | | | | | | | (0.04) |
| number of observations | 86 | 86 | 86 | 86 | 79 | 79 | 79 |
| R-squared | 0.56 | 0.47 | 0.64 | 0.61 | 0.65 | 0.60 | 0.64 |

*Note:* *** significant at the 1% level, ** significant at 5% level, * significant at 10% level, standard errors are in the parentheses

Table B.11: Political transparency index regression analysis with the averaged data

| | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| constant | 1.44*** | 1.22*** | 1.39*** | 1.41*** | 1.07*** | 1.63*** | 1.34*** |
| | (0.28) | (0.28) | (0.27) | (0.28) | (0.30) | (0.32) | (0.29) |
| past inflation | 2.95 | 2.49 | 2.53 | 3.87 | 0.17 | -0.30 | 0.10 |
| | (5.53) | (5.42) | (5.29) | (5.75) | (5.37) | (5.54) | (5.42) |
| de facto ER regime | 0.09*** | 0.12*** | 0.07** | 0.08** | 0.07* | 0.06 | 0.06 |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.04) | (0.04) | (0.04) |
| financial depth | -0.00 | 0.00 | 0.00 | -0.00 | -0.00 | -0.00 | -0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| GDP per capita | -0.00 | -0.00 | -0.00 | -0.00 | 0.00 | 0.00* | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| rule of law | 0.38** | | | | | | |
| | (0.15) | | | | | | |
| political stability | | 0.29*** | | | | | |
| | | (0.10) | | | | | |
| voice and accountability | | | 0.34*** | | | | |
| | | | (0.10) | | | | |
| government efficiency | | | | 0.37** | | | |
| | | | | (0.16) | | | |
| democracy | | | | | 0.07*** | | |
| | | | | | (0.02) | | |
| autocracy | | | | | | -0.08** | |
| | | | | | | (0.03) | |
| overall polity score | | | | | | | 0.04*** |
| | | | | | | | (0.01) |
| number of observations | 86 | 86 | 86 | 86 | 78 | 78 | 78 |
| R-squared | 0.17 | 0.18 | 0.21 | 0.16 | 0.24 | 0.18 | 0.22 |

*Note:* *** significant at the 1% level, ** significant at 5% level, * significant at 10% level, standard errors are in the parentheses

Table B.12: Economic transparency index regression analysis with the averaged data

| | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| constant | 0.98*** | 0.87*** | 0.93*** | 0.98*** | 0.80*** | 1.46*** | 1.07*** |
| | (0.26) | (0.28) | (0.26) | (0.25) | (0.29) | (0.29) | (0.27) |
| past inflation | -5.69 | -9.35* | -6.33 | -2.33 | -11.32** | -11.42** | -11.21** |
| | (5.24) | (5.40) | (5.04) | (5.20) | (5.07) | (5.04) | (5.01) |
| de facto ER regime | 0.08*** | 0.08** | 0.07** | 0.07** | 0.05 | 0.03 | 0.04 |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.04) | (0.03) |
| financial depth | 0.00 | 0.00 | 0.00 | 0.00 | -0.00 | -0.00 | -0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| GDP per capita | -0.00 | 0.00 | 0.00 | -0.00 | 0.00 | 0.00** | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| rule of law | 0.39*** | | | | | | |
| | (0.14) | | | | | | |
| political stability | | 0.03 | | | | | |
| | | (0.10) | | | | | |
| voice and accountability | | | 0.33*** | | | | |
| | | | (0.10) | | | | |
| government efficiency | | | | 0.57*** | | | |
| | | | | (0.1470525) | | | |
| democracy | | | | | 0.0735904*** | | |
| | | | | | (0.02) | | |
| autocracy | | | | | | -0.11*** | |
| | | | | | | (0.03) | |
| overall polity score | | | | | | | 0.05*** |
| | | | | | | | (0.01) |
| number of observations | 86 | 86 | 86 | 86 | 78 | 78 | 78 |
| R-squared | 0.30 | 0.23 | 0.32 | 0.35 | 0.34 | 0.34 | 0.35 |

*Note:* *** significant at the 1% level, ** significant at 5% level, * significant at 10% level, standard errors are in the parentheses

Table B.13: Procedural transparency index regression analysis with the averaged data

| | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| constant | 0.17 | 0.11 | 0.18 | 0.18 | -0.03 | 0.75* | 0.31 |
| | (0.35) | (0.36) | (0.34) | (0.35) | (0.38) | (0.39) | (0.37) |
| past inflation | -6.34 | -7.03 | -4.93 | -4.53 | -7.77 | -8.13 | -7.74 |
| | (7.08) | (7.00) | (6.78) | (7.26) | (6.77) | (6.88) | (6.78) |
| de facto ER regime | 0.18*** | 0.18*** | 0.16*** | 0.17*** | 0.12** | 0.10** | 0.10** |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.05) | (0.05) | (0.05) |
| financial depth | 0.006 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| GDP per capita | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00** | 0.00* |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| rule of law | 0.14 | | | | | | |
| | (0.20) | | | | | | |
| political stability | | 0.06 | | | | | |
| | | (0.14) | | | | | |
| voice and accountability | | | 0.27** | | | | |
| | | | (0.13) | | | | |
| government efficiency | | | | 0.25 | | | |
| | | | | (0.21) | | | |
| democracy | | | | | 0.10*** | | |
| | | | | | (0.03) | | |
| autocracy | | | | | | -0.12*** | |
| | | | | | | (0.04) | |
| overall polity score | | | | | | | 0.06*** |
| | | | | | | | (0.02) |
| number of observations | 86 | 86 | 86 | 86 | 78 | 78 | 78 |
| R-squared | 0.28 | 0.28 | 0.31 | 0.29 | 0.36 | 0.33 | 0.35 |

*Note:* *** significant at the 1% level, ** significant at 5% level, * significant at 10% level, standard errors are in the parentheses

Table B.14: Policy transparency index regression analysis with the averaged data

| | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| constant | 0.42 | 0.22 | 0.36 | 0.42 | -0.09 | 0.94** | 0.39 |
| | (0.41) | (0.42) | (0.40) | (0.39) | (0.44) | (0.46) | (0.42) |
| past inflation | -4.68 | -8.54 | -5.27 | 0.06 | -9.51 | -10.24 | -9.60 |
| | (8.15) | (8.29) | (7.80) | (8.14) | (7.76) | (8.08) | (7.85) |
| de facto ER regime | 0.20*** | 0.21*** | 0.17*** | 0.18*** | 0.12** | 0.11* | 0.11** |
| | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) | (0.06) | (0.05) |
| financial depth | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.009) | (0.00) | (0.00) | (0.00) |
| GDP per capita | -0.00 | 0.00 | -0.00 | -0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| rule of law | 0.55** | | | | | | |
| | (0.22) | | | | | | |
| political stability | | 0.15 | | | | | |
| | | (0.16) | | | | | |
| voice and accountability | | | 0.48*** | | | | |
| | | | (0.15) | | | | |
| government efficiency | | | | 0.79*** | | | |
| | | | | (0.23) | | | |
| democracy | | | | | 0.13*** | | |
| | | | | | (0.03) | | |
| autocracy | | | | | | -0.15*** | |
| | | | | | | (0.05) | |
| overall polity score | | | | | | | 0.08*** |
| | | | | | | | (0.02) |
| number of observations | 86 | 86 | 86 | 86 | 78 | 78 | 78 |
| R-squared | 0.30 | 0.26 | 0.33 | 0.34 | 0.37 | 0.32 | 0.36 |

*Note:* *** significant at the 1% level, ** significant at 5% level, * significant at 10% level, standard errors are in the parentheses

Table B.15: Operational transparency index regression analysis with the averaged data

| | I | II | III† | IV | V† | VI | VII† |
|---|---|---|---|---|---|---|---|
| constant | 0.38 | 0.20 | 0.35 | 0.36 | -0.24 | 0.64* | 0.17 |
| | (0.34) | (0.35) | (0.29) | (0.34) | (0.29) | (0.38) | (0.30) |
| past inflation | -4.24 | -6.92 | -2.96 | -2.17 | -5.68 | -6.25 | -5.72 |
| | (6.86) | (6.94) | (5.00) | (7.05) | (6.39) | (6.63) | (5.39) |
| de facto ER regime | 0.10** | 0.12** | 0.07* | 0.08* | 0.05 | 0.03 | 0.03 |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.05) | (0.04) |
| financial depth | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| GDP per capita | -0.00 | 0.00 | -0.00 | -0.00 | 0.00 | 0.00* | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| rule of law | 0.44** | | | | | | |
| | (0.19) | | | | | | |
| political stability | | 0.15 | | | | | |
| | | (0.13) | | | | | |
| voice and accountability | | | 0.55*** | | | | |
| | | | (0.11) | | | | |
| government efficiency | | | | 0.51** | | | |
| | | | | (0.20) | | | |
| democracy | | | | | 0.11*** | | |
| | | | | | (0.02) | | |
| autocracy | | | | | | -0.13*** | |
| | | | | | | (0.04) | |
| overall polity score | | | | | | | 0.07*** |
| | | | | | | | (0.01) |
| number of observations | 86 | 86 | 86 | 86 | 78 | 78 | 78 |
| R-squared | 0.23 | 0.19 | 0.35 | 0.24 | 0.35 | 0.30 | 0.34 |

*Note:* *** significant at the 1% level, ** significant at 5% level, * significant at 10% level, † robust standard errors, standard errors are in the parentheses

Table B.16: Panel data regressions using fixed effects method including the interaction term

| | I | II | III | IV | V | VI | VII |
|---|---|---|---|---|---|---|---|
| constant | 3.97*** | 4.04*** | 3.971*** | 3.84*** | 3.87*** | 4.28*** | 4.14*** |
| | (0.41) | (0.41) | (0.41) | (0.42) | (0.54) | (0.47) | (0.47) |
| past inflation | -6.30 | -6.78* | -6.69* | -6.07 | -5.23 | -4.90 | -5.12 |
| | (3.96) | (3.96) | (3.95) | (3.95) | (4.14) | (4.15) | (4.15) |
| de facto ER regime | -0.18*** | -0.19*** | -0.19*** | -0.17** | -0.17** | -0.16** | -0.16** |
| | (0.0692894) | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) |
| Openess*De facto ER regime | 0.00*** | 0.00*** | 0.00*** | 0.00*** | 0.00** | 0.00* | 0.00* |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| financial depth | 0.02*** | 0.02*** | 0.02*** | 0.02*** | 0.02*** | 0.02*** | 0.02*** |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| GDP per capita | 0.00*** | 0.00*** | 0.00*** | 0.00*** | 0.00*** | 0.00*** | 0.00*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| rule of law | 0.31 | | | | | | |
| | (0.33) | | | | | | |
| political stability | | 0.19 | | | | | |
| | | (0.19) | | | | | |
| voice and accountability | | | 0.27 | | | | |
| | | | (0.30) | | | | |
| government efficiency | | | | 0.48* | | | |
| | | | | (0.29) | | | |
| democracy | | | | | 0.06 | | |
| | | | | | (0.05) | | |
| autocracy | | | | | | -0.02 | |
| | | | | | | (0.05) | |
| overall polity score | | | | | | | 0.03 |
| | | | | | | | (0.03) |
| number of observations | 428 | 428 | 428 | 428 | 392 | 392 | 392 |
| overall R-squared | 0.18 | 0.15 | 0.20 | 0.22 | 0.24575 | 0.19 | 0.229 |

*Note:* *** significant at the 1% level, ** significant at 5% level, * significant at 10% level, standard errors are in the parentheses