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MASTER THESIS

The Determinants of central banking transparency: An Empirical Analysis

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Declaration of Authorship

The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

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Prague, May 17, 2013

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Acknowledgments

Abstract

This thesis examines the central banking transparency and financial stability communication. The main goal is to find the determinants of the updated Monetary policy transparency index and the index for financial stability transparency, which cover 110 countries during the period 2000-2011. We analyse the individual components of transparencies and perform regression models with the set of economic and political variables in order to find drivers of all aspects of transparency. As a basic observation we verified the increasing trend in both types of transparencies during last two decades. We found out that economically well developed countries with flexible exchange rates, quality government and stable political institutions tend to be more open about their monetary policies. Moreover, high degree of monetary policy transparency and the occurance of past systemic banking crisis implies higher openness of central banks about financial stability issues. The drivers of Financial stability transparency index components display significant variations, especially variables like rule of law or past financial distress. It is concluded that financial stability transparency is still a young field of study and many central banks are still in the developing phase of learning.

Keywords	central banking, transparency, monetary policy, financial stability
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Abstrakt

Tato práce zkoumá transparenci centrálního bankovnictví a komunikaci ohledně finanční stability. Hlavním cílem je najít determinanty aktualizovaného indexu transparence monetární politiky a indexu transparence ohledně finanční stability, které zahrnují 110 zemí a období 2000-2011. Dále byly zkoumány jednotlivé složky indexů, na nichž byly provedeny regresní analýzy za použití předem definované sady ekonomických a politických proměnných. Tímto jsme se snažili najít faktory ovlivňující všechny faktory transparence. Potvrdili jsme stoupající trend v obou oblastech transparence během posledních dvou desetiletí. Ekonomicky dobře rozvinuté země s flexibilním měnovým kurzem, vysokou kvalitou vládnutí a stabilními institucemi jsou otevřenější o svých monetárních

politikách. Výsledky dále ukazují, že vysoký stupeň transparence monetární politiky a minulé bankovní krize mají za následek vyšší otevřenost centrálních bank o tématech finanční stability. Determinanty jednotlivých komponentů indexu transparence ohledně finanční stability vykazují zřetelné variace, obzvláště proměnné jako zákonnost nebo minulé finanční krize. Celkově vzato je komunikace o finanční stabilitě mladý obor a mnoho centrálních bank je stále v počáteční fázi získávání znalostí.

Klíčová slova	centrální bankovnictví, transparence, monetární politika, finanční stabilita

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Master Thesis Proposal

Author	Bc. Tomáš Ulrich
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Proposed topic	The Determinants of central banking transparency: An Empirical Analysis

Topic characteristics My thesis will focus on the transparency of central banking and its main determinants. The role of central banking is being widely discussed in recent years and transparency of its behavior is an important factor while evaluating certain monetary policy. Recently, there has been wide discussion about the benefits and drawback of the transparent monetary policy. Latest research shows that central banking transparency has been currently increasing, in general means. As a part of my thesis I verify this trend using latest dataset.

Also, various effects of higher transparency are a subject of many papers, for instance effect on the variability and consistence of inflation. Thus, I will try to explore what particular determinants are significant for the level of transparency and what consequences it has in various countries. To distinguish my work from other papers, I will examine how the monetary policy efficiency translates into subsequent transparency of central bank. Therefore, I will try to find a relationship between country's level of inflation and its composite monetary transparency index with the motivation to explain its variations.

Hypotheses At this early stage of my research, there are several questions, which could be potentially answered in the thesis. Firstly, I would like to discuss whether stable political institutions and democracies imply higher central banking transparency. Second hypotheses would be that higher monetary policy transparency is associated with lower inflation variability. Probably as the most beneficial hypotheses of my thesis, I will examine if high effectiveness of country's monetary policy results in higher central bank transparency.

Methodology While evaluating transparency levels of world's central banks, I will use the composite monetary policy index for the period 2000-2011 for approximately forty emerging countries. To further characterize differences in central bank transparency over time and across countries, I will use regression analyses comprising cross-section data with all variables averaged over the whole period, but also time series and fixed effects models. By doing this I explore the influence of specific variables on the central banking transparency indices. The core explained variable will be the monetary transparency index which captures the economic, political, procedural, policy and operational aspects of monetary policy transparency. To the main explanatory variables will certainly belong the monetary policy efficiency proxied by the country's inflation targeting success (measured as a gap between the inflation target and observed inflation in each country), accompanied by other economic and political potential determinants, such as GDP per capita, exchange rate regime, political stability or voice and accountability.

Outline

1. Introduction
2. Basic notions on the monetary policy transparency
3. Transparency indices and variables
4. Empirical analysis and methodology
5. Explored effects and results
6. Suggested recommendations for central banking
7. Conclusions

Core bibliography

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Chapter 1

Introduction

Transparency of monetary policy actions has become a widely discussed issue in last two decades. Nowadays, central banks are supposed to be open about their objectives, outlooks and strategies much more than in the past. There is a number of arguments and consequences lying behind the trend of increasing transparency. Since central banks currently posses its own policy independence on the government, the automatic mechanism for ensuring their accountability disappeared. Therefore central banks need to be transparent about their decisions in order to be sufficiently accountable. The advantages of higher monetary policy transparency has been both mentioned and questioned in the literature, it is still an unresolved question how far it can get.

Financial stability is nowadays one of the key objectives for many governments, especially after the recent financial distress. Central banks play an important role in maintaining financial stability, since they develop and implement macroprudential policies including banking regulation and supervision. Central banks are interested in financial stability, because without it they are not able to achieve another macroeconomic goals like price stability. However, since information assymetries can cause disruptions and confusions in finacial markets, central banks need to communicate about financial stability issues with other institutions and agents. Thus transparency on promoting financial stability is an efficient instrument for central banks to reach their goals.

The objective of this thesis is to provide a comprehensive evaluation of the monetary policy transparency and openness about financial stability issues. For this purpose we will use the indices for monetary policy and financial stability transparency, both updated until 2011. We will describe the latest trends in the communication on both issues throughout 110 countries. Further, we

carry out a number of regressions using a specific set of economic and political variables. By doing this we try to find main determinants of both transparencies since 2000. We extend the work by Horvath & Vasko (2012) by investigating the individual components of financial stability transparency index, capturing different aspect of transparency. Our models should also verify the assumption that past financial crisis and government quality impact the transparency of central banking.

The thesis is structured as follows: Chapter 2 provides some basic theoretical background of monetary policy transparency. It describes its main consequences and explains why central banks actually are motivated for comprehensive information disclosure. Further, the concept of financial stability is discussed here and how it is measured. One of the sections is denoted to financial stability reports as one of the most important devices for communication with the public.

Chapter 3 provides the examination of transparency about central bank's policies and strategies. It describes the general trends in the world and in the individual countries. Moreover, it identifies the main drivers of the central banking transparency using several regressions. By decompositing the monetary policy index the individual aspects of transparency are examined.

In Chapter 4 the analysis of transparency regarding financial stability is presented. Like in the previous chapter, updated dataset until 2011 is used in order to find determinants of Financial Stability Transparency index. The twelve subindicies are consequently analysed in a similar set of regressions in order to explain drivers of the publication of financial stability reports, macroprudential policies, stress tests and indicators.

Chapter 5 concludes the topic and summarizes the observed results.

Chapter 2

Transparency and theoretical background

2.1 Notions on monetary policy transparency

The aim of this section is to introduce the issue of central banking transparency. Such a descriptive part includes discussion of transparency causes, historical development of central banking transparency, its main impact on certain monetary policy and consequences.

At first it would be appropriate to get familiar with the concept of central banking transparency and what it actually is. Generally spoken, monetary policy lies on three main pillars - independence, accountability and transparency. Each of these elements has a very specific role for the proper functioning of central bank. Independence consists of the freedom from control or influence of others and the immunity from arbitrary exercise or authority (also freedom and autonomy). Accountability is understood as responsibility or the trait of being answerable to someone for something. And finally, transparency equals to understandability or the quality of comprehensible language or thought (Eijffinger & Hoeberichts 2000).

Transparency of monetary policy should primarily denote the transparency of central bank about its objectives, outlooks and strategies. Under such transparency, public can derive true target from the knowledge of the economy and

published forecasts by the central bank. The main components of central bank transparency can be assessed according to these guidelines:

- if minutes are published;

- if voting of individual members are published;

- if there is a press release even when no change in policy took change;

- if forecast including relevant details is published;

- if forecasting models are published;

- if reports are forward-looking.

In the past central bank transparency was not a very hot issue, but the world of monetary policy has changed a lot in last decades. According to Smidkova (2012), central banks achieved in 1990s more power than any other institutions, so accountability and transparency became important issues. In 2000s the financial crisis opened several issues such as threat to independence or certain limits to transparency. Nevertheless, it seems that nowadays the move in the direction of policy transparency is quite significant. To find out whether this trend is about to be permanent or whether it is just one part of long-term fluctuations, we need to understand more deeply what lies behind these variations. Partially, we focus for a moment on the motives of higher transparency and its impacts.

2.1.1 Transparency impacts and consequences

Several papers has been written about the impacts of transparency on the country's monetary policy. Most of them acknowledges positive effects on the efficiency of monetary policy. According to Dincer & Eichengreen (2009), transparency about monetary policy objectives, strategies and outlooks enhances the monetary policy effectiveness. They state that this transparency is necessary for better communication with the markets, which is a prerequisite for

monetary policy to have stabilizing effects. Moreover, they emphasize the key channel of monetary policy interventions - expectations - which are much more manageable by the policy makers if central bank is transparent. In other words, transparent monetary policy makes it much easier for all market participants to anticipate central bank actions, which minimizes disturbances in the case of policy change. Another important function of monetary policy transparency lies according to this study in the ability to influence consumption and investment. This mechanism should be based on the assumption, that thanks to the transparency of current and future expected policy the central bank obtain leverage over long-term interest rates.

Benefits of higher central bank transparency were acknowledged by Crowe & Meade (2008) as well. They argue that enhanced transparency of central bank practices is associated with the greater ability of private sector to use information provided by the central bank. They also examine the current levels and relationship between central bank independence and transparency. Basic finding is that more independent countries tend to be also more transparent. Also, transparency is positively correlated with quality of national institutions measured by six political and institutional variables constructed by Kaufmann *et al.* (2009).

As several empirical studies suggest, higher central bank transparency may reduce uncertainty in financial markets. This finding is related to the ability of market participants to react to the information disclosure provided by central banks. For example, Kuttner & Posen (2000) examined two important central banks, Federal Reserve and the Bank of Japan. They concluded that the exchange rate volatilities in this countries decreased thanks to the higher degree of transparency over time. The benefit of transparency in terms of reduced uncertainty was confirmed by Tarkka & Mayes (1999). The authors use a Barro-Gordon model which leads them to a conclusion that publishing the central bank's forecasts results in better macroeconomic performance. These results are in the line with the general theoretical concept, that central bank

transparency contributes to the greater and more effective communication with market participants and helps them to better anchor their expectations.

Another papers observe that transparency is beneficial for social welfare. Geraats (2001) arguments that with higher central bank transparency the inflation and interest rates are lower, whereas output stays the same at the same time. In order to achieve this desirable situation, both forecasts of inflation and output have to be announced to public. Author has also pointed out another positive consequence of central bank transparency, which is called the signaling effect. This phenomenon is based on the principle that if a central bank publishes the forecast, it sends a signal to the market that it is confident in it. Such theory is probably valid mostly for strong and highly credible banks, since weak central banks generally do not like opening their kitchens.

A welfare-improving effect of greater central bank transparency was confirmed by Faust & Svensson (2001). In their model they examine inflation and employment, for which they distinguish three regimes of transparency according to its level. In the least transparent regime public cannot observe nor the intentions of the central banks neither the employment objective. The second regime of transparency is characterized by the public announcement of central bank's inflation target. Thus the inflation intentions are observable by the public, causing that central bank's reputation is more sensitive to potential policy changes. These circumstances results in lower inflation. And finally the third transparency regime characterized as extreme transparency by authors. In this regime both inflation and employment pursued values are published. In the study authors use a modified Barro-Gordon model for the analysis. At first, the central bank's employment target is not announced, thus it varies over time as an idiosyncratic component changes. These variations influences the further decision-making of central bank, that tends to deviate from a published inflation target. This artificial behavior results in the imperfect control of inflation which breaks down into two components - the first which is intended by central banks and the second which can be described as a control error. The control

error plays an important role in the model, specifically the degree central bank publishes its knowledge about it. The more the central bank disclose the control error, the more public is able to deduce the employment target of central bank. Thus with the increasing level of control error disclosure the degree of central bank transparency increases. The crucial conclusion of Faust & Svensson (2001) is that transparency reduces inflation variability, inflation bias and employment variability.

The relationship between the overall economic level of a country and central bank transparency is also subject of some studies. Horvath & Vasko (2012) conclude that more developed countries tend to have more transparent monetary policy than other countries. Authors also try to resolve how transparency evolves during bad times and crisis. General result is that high financial distress in the country implies lower central bank transparency. To put it into another way, financial stability transparency is beneficial in normal times, whereas during financial distress it appears to be risky.

2.1.2 Critique of excessive transparency

Potential benefits of high central bank transparency have been questioned, there are studies which actually shows that if transparency goes too far it can be on the contrary counterproductive for the economy. Morris & Shin (2002) show a great skepticism about the benefits of central bank transparency. They constructed a model where both private and public information are imperfect. Greater precision of public information can then lead individuals to attach inadequate weight to private information. In other words, in this scenario the additional transparency destabilizes expectations and intensifies volatility of financial market. van der Cruijsen *et al.* (2008) also focus on the negative aspects of transparency, suggesting that market agents may become confused by the huge amount of information which is even increasing in a regime where central banks are highly transparent. They observe that due to the extensive transparency agents may reveal the uncertainty of central bank about the efficiency

of policy and economic conditions, which again increases the volatility. Another interesting conclusion of this study is that there is likely to be an optimal intermediate degree of central bank transparency. If the real inflation is below this optimal value, more transparency is desirable, since it improves quality of inflation forecasts of private sector. On the other hand, inflation above its optimal degree is harmful for private sector forecasts. To put this theoretical in practice, several banks would benefit from further increase of transparency, whereas some of them have already reached its optimal level.

To explain why all of central banks do not attempt to disclose as transparent policy forecasts as possible, Chortareas *et al.* (2001) offer a clarification. According to their paper, higher central bank transparency should have a smaller impact on inflation when the credibility of central bank is assured by other ways. This theory is supported by empirical results of their study. It suggests a lower impact of higher transparency on countries which use exchange rate targeting regime, as well as lower impact on countries which already possess low inflation and relatively high credibility.

Similar findings are described by Jensen (2001), who adopts an information structure suchlike Faust & Svensson (2001). The study confirms the redundancy of credibility-enhancing effect of higher transparency in countries, where public disclosure already is at high level. There are also increased reputational costs of deviating from the inflation target as a result of higher transparency. Moreover, a high degree of transparency is not unconditionally desirable, since it strongly depends on the trade-off between flexibility and credibility. Authors conclude that high level of transparency is beneficial for central banks with poor credibility, on the other hand it can be harmful for high credible central banks in terms of their flexibility.

According to some papers, excessive transparency can disrupt communication with the public. The author argues that due to the high transparency the public might get confused with so many information. People could not understand that the central bank's forecasts are dependent on the future state

of the economy, therefore changes in the forecast might be misinterpreted.

Another circumstance is that evidence about monetary policy transparency is relatively new, both theoretical and empirical. Therefore many countries have not yet completed their quest of transition to higher transparency. This evidence is further supported by the fact, that benefits of inflation targeting for the overall credibility, which is strongly related to the central bank transparency, emerged in the 1990s, which is not very long time ago.

The majority of academic literature is from its definition theoretical, which can however put into question the practical usefulness of these theories, since not all of them provide practical advices for policy makers. This topic is addressed by Carpenter (2004), as he reviews the theoretical conclusions written before and tries to construct real-life recommendations for central banks. From this point of vies the author emphasizes mainly the communication consequences. Policy makers achieve better communication with the public, which is beneficial for public to better understand the central bank's goals and its interpretation of economy. In case of forecasts the impact is arguable as the public may underestimate the uncertainty which is necessarily incorporated in central bank's forecasts. This consequence of imperfect information can in fact be destabilizing.

Geraats (2005) attempts to bridge the gap between the theory and practice of monetary policy transparency as well. It provides usefull theoretical insights and systematically explores transparency practices. The results about transparency are rather positive and point out the benefits of transparency. However, the main contribution is in presenting three stylized facts, which may seems quite obvious for us. First, central banks consider transparency very important for their monetary policy. Second, transparency has significantly increased in last 15 years. And third, transparency of monetary policy displays substantial heterogeneity across monetary policy frameworks. Another observation is that inflation targeting does not necessarily mean higher transparency in all aspects. The author argues that there are great variations in the level of

central banking transparency among inflation targeters.

As can be seen from the review of the literature which address benefits and drawbacks of central bank transparency, the debates are rather complicated and cannot be solved simply and unambiguously. One cannot generally state for sure that all central banks should hunger for the highest transparency possible in order to reach effective monetary policy. To summarize all available theoretical and empirical sources, we can deduce that central bank transparency is rather individual problem. One need to analyze the characteristics of each individual central bank, such as the current level of transparency, credibility among public and general economic situation in the country. Nevertheless, the issue of central bank transparency is still emerging and discussion about its benefits and drawbacks are naturally proliferating. This development could help mainly those central banks, which are relatively young and not yet very well-established.

As different theories do not reach an agreement about the impact of transparency, this thesis chooses the most objective way possible to test theoretical work. For this purposes the empirical analysis is certainly the most appropriate. Firstly, we show the recent general trend in central banking transparency using real-life data. Secondly, we try to identify main determinants affecting the level of transparency. Another main goal would be to analyze the relationship between the success rate of country's monetary policy and central bank's transparency.

2.1.3 Measurement of transparency

In order to assess impact of the certain framework on economy, the essential step is to measure the three monetary policy pillars including transparency. Theoretical concepts are relatively clear, however practice could be much more challenging. There were constructed various indices by different authors, which implies the assessments to differ as well.

One of the first indices has been constructed by Fry *et al.* (2000). It is

a very comprehensive study in terms of country coverage, although the index was compiled only for 1998. A study by Bini-Smaghi & Gros (2001) was more sophisticated, they already considered 15 aspects of central bank transparency, although they included only four central banks. De Haan & Amtenbrink (2002) developed similar index for 15 countries, while De Haan & Waller (2004) applied a similar approach to another six countries. Siklos (2006) extended the coverage to 20 central banks from advanced industrial countries.

Another transparency index compiled by Eijffinger & Geraats (2006) becomes more sophisticated and is of our bigger interest. Unlike the others, this indicator as the first one captures five aspects of central banking transparency - economic, political, procedural, policy and operational. So far it was compiled for 9 central banks based on objective information. Dincer & Eichengreen (2009) used this index as the starting point and extended it significantly. They drew data from the available published documents, like websites, annual reports or statutes. They managed to gather data for 100 central banks for every year from 1998 through 2006. This comprehensive was updated by Horvath & Vasko (2012). They developed a comprehensive index of the transparency of central banks for 110 countries from 2000 to 2011. This one is the index we are going to use in this thesis.

2.1.4 Central bank transparency and inflation

The relationship between transparency of central bank and inflation, which can be under certain conditions considered as a measure of monetary policy effectiveness, is not by a chance a very discussed topic. A study by Demertzis & Hallett (2004) examines the effect of transparency on inflation and output gap. First conclusion is that central bank transparency does not affect the average levels of inflation and output, but it has an impact on the variability of these indicators. The empirical findings more or less confirm this theory. Transparency seems to explain approximately half of the variability of inflation, the relation between transparency and output volatility appears to be

slightly positive. Dincer & Eichengreen (2007) show the general trend of increasing transparency in recent years. Moreover, they suggest broadly favorable if relatively weak impacts on the output and inflation variability.

A number of papers examine the impact of central bank transparency on the absolute macroeconomic values. Chortareas *et al.* (2001) provide an international evidence of the potential effect of degree of transparency on monetary policy outcomes, especially inflation. Authors used a cross-sectional dataset of 87 countries covering details about their central banks. Based on the publication of their forecasts they constructed an index for transparency. The impact on inflation, output and their variabilities were examined. The main conclusion is that higher transparency (defined as a degree of detail with which central banks publish forecasts) is associated with lower average inflation. Moreover, higher transparency is not empirically associated with greater output volatility. The results are robust holding even after controlling for a number of macroeconomic and institutional variables. The findings of this study are in contrast with the previous paper, discovering not only impact on inflation variability, but also on its absolute values.

Moreover, there is another problem with the majority findings of positive impact of transparency on macroeconomic variables. This problem is called reverse causality and it may bias the results. In another words, it may be the attainment of low inflation that cause central banks to be more transparent. Even though Chortareas *et al.* (2001) suggest that it is unlikely that this phenomenon distorts the results, it would be worthwhile to examine this reversed causality, therefore this thesis attempts to do it.

2.2   Financial stability and consequences

Since we examine financial stability and its determinants in the empirical part of this thesis, we should discuss this term and what it actually means. For institutions like central banks it is important to have a common understanding of the financial stability, so they are able to operate with it effectively. Nev-

ertheless, every institution constructs its own definition of financial stability. For example, ECB defines financial stability as "a condition in which the financial system - comprising of financial intermediaries, markets and market infrastructures - is capable of withstanding shocks, thereby reducing the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities."

Moreover, ECB defines the three key conditions that have to be met in order for the financial system (which is comprised of financial intermediaries, financial markets and financial markets infrastructures) to be stable:

1. The financial system should be able to transfer resources from savers to investors in a smooth and efficient manner.

2. Financial risks should be well managed and priced and assesed sufficiently accurately.

3. A condition of financial system should be sufficiently healthy so that it can comfortably absorb potential economic distresses and financial shocks.

If one or more of these conditions are not met, the financial system is likely to gradually lose some of its stability, or even to display instability. ECB (n.d.)

The Swedish Riksbank provides also a conprehensive description of financial stability. Riksbank defines financial stability as "meaning that the financial system can maintain its basic functions and also has resilience to disruptions that threaten these functions." The financial system has a similar meaning as in the case of ECB. The fundamental functions from the definitions are meditation of payments, converting savings into funding and management of risk. These functions are described in more detail on their websites.

Schinasi (2004) offers somewhat more friendly and practical definition. He consider financial stability in terms of its ability to facilitate and enhance economic processes, manage risks, and absorb shocks. Moreover, the author sees financial stability as a variable which is changable over time and dependent

on a number of combinations of elements in finance. To distinguish himself from the others, the authors proposes some of the practical implication of his definition.

All in all, the financial stability issue is widely discussed in literature and the understanding of it differs among authors and institutions.

2.2.1 The institutional setting for financial stability

Financial stability is nowadays ensured by public institutions in most countries. However, central bank plays very often the most important role, since it posseses many rights, responsibilities and instruments to have a big influence on country's financial stability. To the instruments of central bank belong for example regulation of the whole banking sector and its supervision or providing liquidity to the financial system if it is needed. These instruments can work ex-ante or ex-post.

The central bank's instruments are easier to be implemented, if they are supported by law. In other words, financial stability can be incorporated in the law as a duty of local central bank. However, as Vasko (2012) reports, this is not the case of all countries of the world. That's why it is difficult to asses performace of central bank promoting financial stability in general. But as the evidence indicates, the trend in the developed countries goes towards ensuring financial stability via central banks.

However, central bank is not the only entity which is responsible for a stable financial system. Financial sector plays an important and irreplacable role in maintaing financial stability. This is bacause central bank needs transmission channels in order to implement effectively its policy measures. Financial sector is a main device of these transmission channels. As ECB reports, "banks, insurance companies and other financial institutions form the first line of defence against financial crises. It is their responsibility to remain viable and solvent, and to check the creditworthiness of borrowers and thus to manage the risks they assume."

The second line is constituted by measures taken by public authorities including central bank. These measures include prudential regulations in the first place, which are obligatory for financial institutions to obey. Only this way the effective risk management is ensured, as well as the safety of depositors' funds and promoting market discipline. Another step is prudential supervision, which means that central bank makes sure that financial institutions follow the prudential regulations. A final step is monitoring and assesment of financial stability, which identifies potentially dangerous areas and risks of the system. ECB (n.d.)

In spite of all measures, financial institutions can run into trouble. Potential problems of financial institutions destabilize the whole system, since they can cause contraction of monetary aggregates and declines in economic activity. In such cases central bank usually need to intervene in order to maintain financial stability, for example influencing interest rates in the economy.

The comparison of macro and microprudential approaches is discussed by Vasko (2012). According to him, it is essential for financial stability that financial institutions of various importance and sizes behave in as responsible way as possible. Then the macroprudential supervision is not that important and the pressure on central bank is not so high. In addition to that, it is also important to prevent big institutions to fall into moral hazard. This can be achieved by effective regulation. To conclude, the role of central bank in promoting financial stability is irreplacable, nevertheless it is just one part of the complex mechanism of transmissions. Therefore every institutions should be aware of this shared responsibility.

2.2.2   Measures of financial stability

Financial stability is not very easy to measure sue to the high complexity of the financial system and high number of individual elements influencing it. Financial stability reports are one of the most important device in assesing potential risks of financial system, detailed description is in the next section.

As Gadanecz & Jayaram (2009) report, there are ongoing efforts to construct a single measure that could capture the fragility of the system and potential distress. They point out the attractivness of composite quantitative measures, since they enable policy makers to monitor the degree of financial stability, anticipate causes of financial stress in the system and communicate more effectively the impacts.

Authors also defines key segments contributing to the financial stability. These are real economy, the corporate sector, the household's sector, the external sector and the financial sector. They discuss what these sectors measure and their signalling properties in detail. Next they describe how to effectively combine key variables in order to construct composite measures of financial stability.

In fact, every central bank construct its own aggregate measure in order to asses their performance. Although there has been attempts to construct a single aggregate measure of financial stability (primarily by IMF), this task is not trivial as the appropriate methodology for all relevant indicators is not very well integrated.

2.2.3   Financial Stability Reports disclosure

Central banks have several motives to communicate with the public and other institutions on financial stability. First, information published by central banks are important for the market and its agents. If they are well informed the problem of asymmetric information is reduced, moreover the expectations of agents can be better anchored and predicted, as indicated by Kuttner & Posen (2000). Subsequently, this kind of transparency contributes to the overall financial stability.

One of the most important device for communication on financial stability are financial stability reports published by central banks. These documents fulfill several functions. According to Born *et al.* (2010), central bank communication on these issues constitutes a central policy tool for the purpose of

macroprudential supervision, which earned high importance in response to the financial crisis of 2007-2010. Indeed, FSRs serve as a control mechanism of the overall economic performance.

Central banks publish their FSRs on websites as well as description of this report. For example, the Reserve Bank of New Zealand describe the Financial Stability Report as an assessment and report of the soundness and efficiency of the New Zealand financial system. The Swiss National Bank presents in its FSR *"its assessment of the Swiss banking sector's and financial market infrastructures? stability. [...] The main purpose of the report for the National Bank is to draw attention to strains or imbalances which could pose a threat to system stability in the short or the longer term. The Bank thus tracks developments in the banking sector from a macroprudential perspective."* We can conclude that although every central bank describes financial stability in its own words, the main purpose stays very similar.

Nowadays financial stability report is published by more than sixty central banks worldwide and the trend has been continuously increasing. These reports become more often a subject of assessment and critique. The first empirical analysis of FSRs was performed by Oosterloo *et al.* (2007) in their paper. They analysed primarily three areas - what motivates central banks to publish FSRs, evaluation of the quality of these documents and examination their impact on indicators like financial soundness. Their main result was that the probability of FSR publication increases with the income per capita, occurrence of a past banking crisis and EU membership. However, they did not manage to find a significant association between the quality of FSR and resulting financial soundness.

As report Horvath & Vasko (2012), financial stability reports have their own appropriate structure. They begin with the general assesment of the financial stability, followed by core analytical aspects or in some cases policy-oriented articles. The analytical part should contain three main groups of indicators: soundness indicators, stress tests and market-based indicators. Implementing

these sets of indicators ensures capturing all of the main risks, including interest rate risk, liquidity risk, credit risk or exchange rate risk. The soundness indicators aggregate individual indicators from financial institutions in order to describe the financial health. Stress tests indicates the resiliency of the system to potential financial distresses. Finally market-based indicators usually include stock prices of financial institutions, their volatility or probability of default. They provide useful information of potential risks in the future.

The communication of central banks, including minutes and votes, has an important impacts on financial markets. Born *et al.* (2011) suggest that publication of FSRs has a significant and potentially long-lasting effect on stock market returns. By assesing the reactions of stock markets to these documents, they found out that they also tend to reduce market volatility. On the other hand, interviews and speeches do not have a significant effect on stock markets during peaceful periods. However, they did have a substantial impact during the 2007-2010 financial crisis. Therefore reports containing important information are closely related to the actual economic environment.

In the following sections we analyse deeply financial stability reports across countries, specifically transparency about the key issues. For this we use the index which captures all of the essential elements of financial stability described above. We also evaluate the quality of these reports and openness of central banks on financial stability issues.

Chapter 3

Monetary policy transparency

3.1 Overview and hypotheses

In the core section of this thesis we perform several empirical analyses to explore the real consequences of central banking transparency. Specifically, we examine two types of transparency. The first is the monetary policy transparency, which describes openness of central bank about its policies, goals and forecasts. The second transparency regards promoting of financial stability. In other words, it captures financial stability reports published by a number of central banks and their quality. Another aspects are described further.

Our main goal will be to examine hypotheses stated above in order to verify or deny them. As Dincer & Eichengreen (2009) shows, the general trend of central banking transparency during time period 1996-2006 was substantially growing. In order to extend their study, we expand this simple analysis up to year 2011. By doing so, we explore if the trend in central banking transparency has somehow altered or remained the same. If it has changed in the last six years, it would be very beneficial to look at the problem from a broader perspective and to explain what other consequences are relevant to the development of monetary policy transparency in time.

In addition to that, we try to identify key determinants of monetary policy transparency. To have something to start with, we take a study performed by

Dincer & Eichengreen (2009) and verify their results with the updated dataset. Specifically, we test whether stable political institutions have a significant impact on the transparency central banks show. Moreover, we extend the original study by addressing endogeneity of the variables. We also take into account the decomposition of the monetary policy transparency and examine its sub-components in detail. Further description can be found in the following chapters.

Second hypothesis is closely related to the monetary policy targets, especially monetary policy which operates in the regime of inflation targeting. It assumes that high effectiveness of country's monetary policy results in higher transparency of central banking. It is important to answer, why would a central bank which successfully applies its policy intend to increase the level of information it publishes to the public. First motive could be based on the assumption, that central bank believes that its increased efficiency was at least partially caused by the increased transparency. Subsequently, this central bank wants to achieve even higher transparency in order to be even more effective or at least to maintain current effectiveness. The potential second motive could be based more on pride rather than on rational thinking. In another words, central bank wants simply to show off that it has been successful in its goals in order to increase its own credibility in the public.

And finally, our last hypotheses is connected to the transparency of central banks to promote financial stability. This topic was examined by Horvath & Vasko (2012), who constructed the Financial Stability Index and analysed its determinants and consequences. We attempt to go further with similar but adjusted methology. The contribution of this thesis is deeper analysis of this kind of transparency in terms of its sub-components. Moreover, we take a different attitude to the role of financial distress in this issue, implementing more comprehensive measure of financial crisis. By doing this, we examine what drives central banking transparency regarding stability issues and what is the role of financial crisis in it.

3.2   Data and basic results

In the first part of this thesis we are going to use numerous variables from different sources. Central banking transparency, which is of our highest interest, is measured by the composite monetary policy transparency index constructed by Dincer & Eichengreen (2009) and later updated by Horvath & Vasko (2012). Unlike most of the other transparency indices compiled in the past, this one takes into consideration that transparency has multiple dimensions. It is comprised of 15 subindices in order to capture all of the aspects of monetary policy transparency, specifically economic, political, policy, procedural and operational aspects. Economic transparency denotes openness about data, models and forecasts; political transparency openness about objectives of monetary policy; policy transparency openness about the policy implications; procedural transparency openness about the methods decisions are taken; and operational transparency openness about implementations of approved decisions.

The data is available for the time period 2000-2011, which is included in the updated dataset by Horvath & Vasko (2012). The index was gathered for 110 central banks worldwide, most of the omissions are micro-states not very influential in the large scale.

We performed a simple graphical analysis in order to examine transparency trends over time. The same was done by Dincer & Eichengreen (2009) comparing years 1998 and 2006. Their result was very striking, none of examined 100 countries moved in the direction of less transparency. With only 10 countries remaining on the same level of transparency throughout the whole period, the other 90 countries showed an increase in central banking transparency. We make an update up to 2011 to see what happened to the overall trend. Figure 3.1 shows the results plotting values of comprehensive monetary policy transparency index in year 2006 on x-axis and 2011 on y-axis.

Figure 3.1 shows that central banks all around the world still demonstrates the general trend of increasing transparency, although the strength of this trend
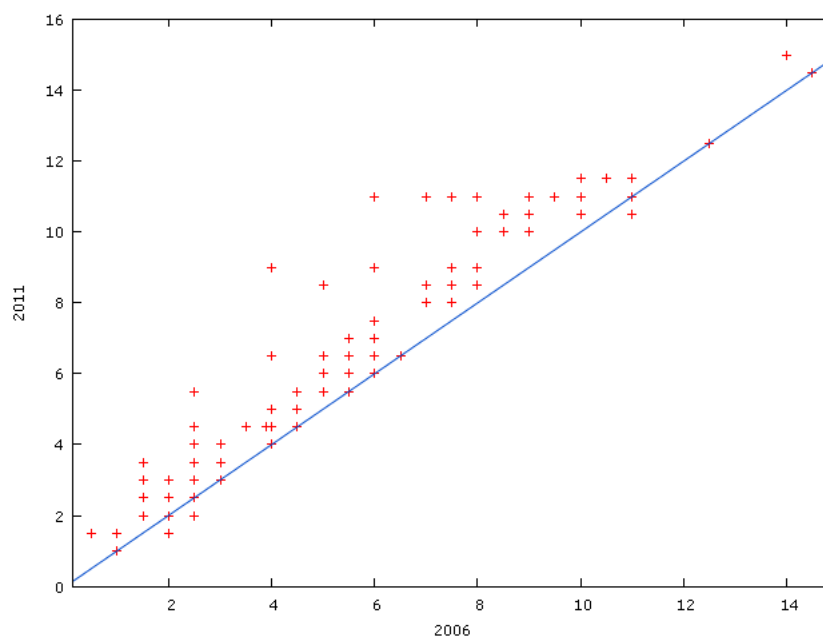
Figure 3.1: The MPT index comparison between 2006 and 2011
Source: own scheme

is not so big as in the previous time period. In total 14 countries out of 110
examined shows decreased transparency in 2011. These are usually lower-
level transparency countries from American region, such as Bahamas, Barba-
dos, Cuba, El Salvador, Brazil, Bermuda and Canada, then Solomon Islands,
Bahrain and four European countries - Belarus, Bulgaria, Denmark and Croa-
tia. To the 10 countries for which the transparency remained the same belong
Ethiopia, Malawi, Libya, Tunisia, Pakistan, Singapore, Saudi Arabia, United
Arab Emirates, Ukraine, Sweden and United Kingdom. The rest of countries
(86 in total) shows higher transparency of central banking in 2011 than in
2006. This empirical finding confirms the theoretical concepts, which builds
on assumption that higher central banking transparency is beneficial for the
efficiency of country's monetary policy.

Another interesting view of point is to describe trends of transparency devel-
opment throughout the time. Figure 3.2 shows such evolution for three groups
of countries according to their economic level, i.e. income or GDP per capita.
Focusing on absolute values, the level of transparency is constantly increasing
for all groups, which is consistent with our basic hypotheses. Another obser-

vation is that level of economic development has an impact on central banking transparency. From time series we can see that highly developed countries are more transparent than emerging countries, which are in turn more transparent than developing countries. This potential relationship is analyzed more deeply in following paragraphs. If we turn our attention to the rates of transparency growth, we observe that emerging countries display fastest growth from all of the three groups. This fact is consistent with high dynamics of economic development of these countries.
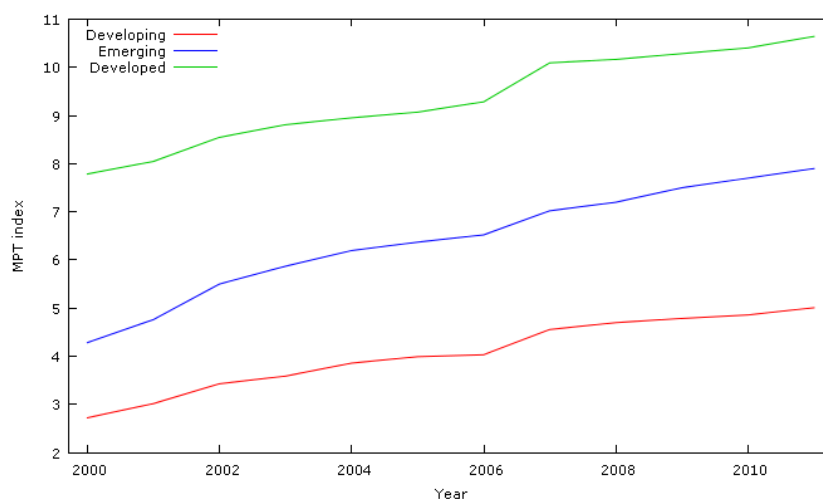
Figure 3.2: Evolution of MPT according to economic development (weighted averages)
Source: own calculations

The complete list of monetary policy transparency index values are shown in Table A.1 for all available countries. In the first column there are absolute values of the index for 2011. In the comparison to the previous study, they are relatively similar to the values from 2006, especially at the top of transparency ranking. The Reserve Bank of New Zealand maintained in the first place with highest transparency index possible. To another central banks with high monetary policy transparency belong Swedish Riksbank, the Bank of England, the Czech National Bank and the Federal Reserve of the United States. On the other hand, least transparent central banks in 2011 were central banks of Bermuda, Ethiopia, Libya and Saudi Arabia.

The second column depicts relative changes in transparency from 2006 to 2011, which shows us interesting trends in individual countries during last period. The best jumper among all is certainly Georgia, which increased its transpareny index from 4 to 9 during five years. Among another good performers are Colombia, Republic of Moldova, Uganda and Armenia. As the evidence shows, those who managed to increase their transparency the most are mainly emerging or not very well developed countries. In contrast to that, the only three countries which decreased their transparency are Cuba, Slomon Islands and, perhaps most surprisingly, Canada, whose absolute level of central banking transparency is very high.

If we take a close look at region simple averages, the most transparent region is Australia and New Zealand, followed by Western Europe (includes Eurozone and Switzerland), Northern Europe and Sout-Eastern Asia, whereas the least transparent regions are East Carribean, Northern Africa and Eastern Africa. In contrast to that, Table A.2 shows transparency index averages weighted with GDP of the individual regions. The ranking of regions does not change very significantly, although some of them fall down a little bit due to their small GDP-weights and relatively high transparency. Regions like Southern Asia, Northern Africa and Eastern Europe are examples of such drop. Despite of small corrections in transparency GDP-weighted-averages among regions, the general comparison stays more or less the same.

3.3 Key factors influencing transparency

In order to further explain consequences and differences in central bank transparency across countries we use several regression analyses. Our goal is to try to find an explanation for the variability of the transparency and to identify determinants and instruments for our analysis of transparency consequences. The methodology of this part of the thesis was already used in Dincer & Eichengreen (2009). We extend and update their study by constructing analogical

dataset prolonged up to year 2011. Moreover, we extend this work by taking account of the potential problem of endogeneity among variables.

At first we wanted to examine basic dependencies among variables, therefore we used cross-section data with all of the variables average over the observed period. These data cover the period 2000-2011 and 110 countries. There are some ommited observations due to missing values of some variable, but these omissions does not have a noticable impact on our results, since concerned countries are mostly small and not very significant. Our main explanatory variable is the monetary policy index, which we regress on a vector of various determinants. These include economic determinants - GDP per capita, inflation history (lagged log first difference of the consumer price index), financial depth (defined as the ratio of M2 to GDP) and the exchange rate regime. Moreover, we include political variables - political stability, rule of law, government efficiency and voice and accountability;[1] we also use a set of democratic orientation dummies as measures of democracy or autocracy levels. The political and democratic variables are included one at a time, since they are strongly correlated with each other.[2]

The usual problem that occurs during regression analysis is related to outliers. In our case outliers are countries with extreme values of certain variables, which could cause an unwelcome bias of our results. We solved this problem by using the method calles "Winsorising" or "Winsorisation". This is essentially a transformation of the data in order to limit such extreme values by replacing them with a specified percentile. In our model we used a 90% Winsorisation, which set all the data below 5% to the value of 5% percentile, and the data above 95% percentile are set to the 95% percentile. By doing this we obtain extimates which are more robust to outlier than by using other methods.[3] When compared to the results without Winsorisation, these results were in fact better

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[1] The political determinants are taken from Kaufmann *et al.* (2009)

[2] GDP per capita, CPI history and financial depth were taken from The World Bank Dataset; the exchange rate regime taken from Reinhart and Rogoff updated until 2007; democracy measures taken from Polity IV Project dataset.

[3] In our regressions we winsorised a few countries including Iraq, Luxembourg and Norway.

and more robust.

The results of the regression are presented in Table A.3. As we can see, economically well-developed countries tend to be more transparent than those from poorer or developing regions. The economical level of country is proxied by GDP per capita, this variable is robust among all regressions. This observation confirms the general intuition that richer countries should also display higher transparency of central banking. Since transparency is one of the essential three components of monetary policy (along with accountability and independence), is seems rational to expect that countries at some economic level should demonstrate also certain level of transparency. Moreover, this result is consistent with the trends in Figure 3.2, where GDP per capita also serves as a proxy for economic development or wealth of a country.

The most significant variable in all regressions is the excahnge rate regime, is has a positive effect on transparency. Since higher values of this variable mean higher flexibility of country's exchange rate, this implies that central banks with more flexible currencies are more transparent. The logic behind this observation could lie in the control mechanisms of central bank actions. If a currency is pegged to another currency by fixed exchange rate, central bank has a limited space for its activities since it is pledged to maintain its exchange rate within given borders. As a consequence, all of the actions made by central bank are in a sense subordinated to this goal. A flexible currency without the peg loses this traditional device for monitoring its actions. Accordingly, responsible central bank has to gain credibility and trust among public in some other way. A convenient possibility is to increase its transparency, i.e. to publish more information about its policy, actions and forecasts.

The political variables are also significant for the level of monetary policy transparency index. Countries with stable political instituons are likely to be more transparent than others. Moreover, countries with high ranking in terms of rule of law have also more transparent monetary policy, as well as governments with high values of voice and accountability and government efficiency.

The coefficients of these political variables are quite high in comparison with other variables, the positive relationship between them and transparency is strong. The effects of polity variables also confirms our intuition. Countries with more democratic political system tend to be more transparent, on the other hand the autocratic systems lowers the transparency of central banking.[4] The role of the development level of financial markets, proxied by financial depth variable, differs across different models. In all of them, the deeper financial system implies higher transparency. Nevertheless, this variable is significant only in models with autocracy score, polity score, political stability and voice and accountability. Other variables are insignificant in this analysis.

To include a form of robustness or sensitivity analyses, we put a variable of openness (exports as a percentage of GDP) in our regression. The results stayed very much the same for all of the regression forms mentioned above.

One of the first hypotheses we wanted to test was the assumed relationship between the effective monetary policy and subsequent transparency. The essential and difficult task was to decide how to actually measure the efficiency of monetary policy. Since inflation nowadays serves as the most important measure of economical performace of the country, the most straightforward approach would be to measure it according to the succes rate of inflation targeting of the country. The inflation gap (difference between the target inflation announced by the central bank and true observed inflation) would be added to the regression. Nevertheless, this approach turned out not to be very effective and we could not use it.[5] Besides that, the inflation gap as a proxy has some important drawbacks. Some of variations in inflation does not necessarily have to be caused by the behavior of central bank, they can have exogenous reasons which cannot be influenced by the central bank. Therefore it would be very useful to filter out those inflation variations which were caused by the global

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[4]It is appropriate to mention that the variable of polity score is just the difference between democratic and autocratic score. It is therefore obvious that this variable is also significant and has a positive impact on central banking transparency.

[5]Only part of world's countries use the inflation targeting regime, data for both inflation target and real inflation could be gathered for just about 28 countries, which is not enough for our purposes

events outside the country in order to ensure the highest possible information value of the results. However, such adjustments would anyway be beyond the scope of this thesis.

Because of these difficulties with testing hypotheses of the impact of efficient monetary policy on its transparency, we had to restrict ourselves to basic impact of inflation history. From our result it can be seen that inflation history is not significant on any convenient confidence levels. If something can be inferred from this, higher inflation has a slightly negative effect on central banking transparency. Although not very strong result, it is consistent with the intuitive relationship between high economical development and high transparency. Central banks displaying not very succesful inflation policy probably does not want to share it extensively with public and vice versa.

As one of the extension of the paper written by Dincer & Eichengreen (2009), we address the potential problem of endogeneity among variables in our analysis. To manage that, we performed another regression which cross-section data, but lagged explanatory variables. To be more specific, we regress the the average of monetary transparency index for period 2006-2011 on the same set of explanatory variables averaged over 2000-2005. By doing this, we find out if there are other correlations than we are examining. The results suggest that there is not an endogeneity problem, which is a great test for our original model.

3.3.1 Determinants of changes in MPT

Another interesting analysis we performed is the examination of factors influencing trends of transparency throughout the time. We included same variables as in the cross-section analysis, however we pooled the observations for all countries and all years from 2000 to 2011. Because we obtained data in the form of comprehensive panel, we had to decide whether to use random effects or fixed effects model. For that we carried out the Hausmann test, where the null hypotheses is that GLS estimator (random effects) is consistent. Low values

of p-values suggested that GLS estimates are inconsistent, therefore we used fixed effects model. Moreover, we also strongly rejected the null hypotheses of common intercepts for all countries. Therefore we chose the fixed-effect model with separate intercepts for each country.

Since all of the annual obrervations were included, this kind of model captures variations of data in time. Accordingly, the coefficients indicates what reasons and determinants lie behind the general trend of increasing transparency. Due to the detailed character of the dataset that was necessary for this model, there are more missing values for some countries and years. However, as in the preceeding work, those ommisions were not very significant and included only a few smaller countries.

The results of fixed-effect model are shown in Table A.4. In cross-section regression we saw that political chareterristics explain the monetary policy transparency quite strongly. In contrast to that, the results of panel analysis are somewhat different. The democratic nature of country's political system does not seem to have a significant impact on the evolution of central banking transparency. On the other hand, the positive changes of GDP per capita and flexibility of exchange rate are positively associated with the time-continuous increase of transparency. Turning our attention to government indicators, rule of law, government efficiency and political stability have a significant effect on the annua positive changes of monetary transparency, according to the results. To check a robustness of the estimates, we included the variable of openness once again. This adjustment did not change our results significantly.

To conclude this chapter briefly, high flexibility of local currency and high general social and economic capability are significant for both of the basic models. In other words, exchange rate regime and GDP per capita have both a significant effect on the level of monetary policy transparency and also on the changes of transparency in time. Government indicators are also strongly associated with level and development of transparency, whereas political aspects affects only its average level. Country's financial depth is significant only

partially.

3.4   Transparency decomposition

Next we broke up the monetary transparency index into its components and analyzed their main determinants, as well as in Dincer & Eichengreen (2009). Since each of the five components captures differents aspects of monetary policy, the examination of their drivers offers us a deeper insight into central banking transparency and the specific actions central banks take. Economic transparency denotes release of information about policy models, data and forecasts, policy transparency means timely announcement and sufficient explanation of policy decisions, political transparency captures the public disclosure of monetary policy objectives, procedural transparency stands for the release of votes and minutes and operational transparency means openness about inplementations and disturbances. Figure 3.3 depicts average values for all of transparency sub-components in 2011.
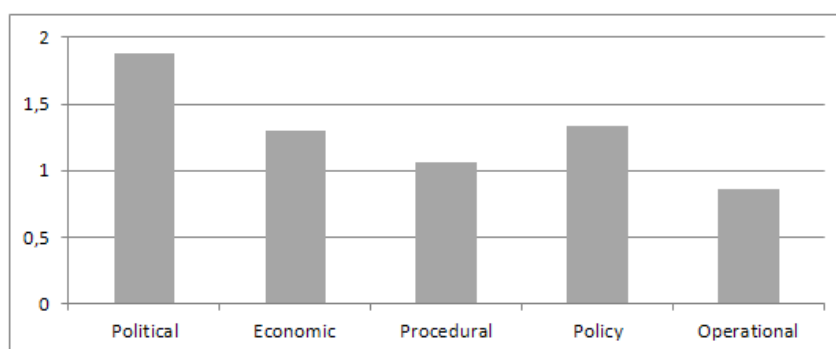
Figure 3.3: MPT components - averages for 2011
Source: own calculations

The detailed results and coefficients of all regressions are in Tables A.5-A.9. As we can see, there are some similar pattern for all of the components. Economic development measured by GDP per capita and exchange rate regime are significant for all transparencies with the positive effect on them. This suggest a great consistency of these two variables, they are associated with every

one of the individual components. The other determinants differs according to the examined component. Economic transparency is positively associated with the highest number of government and political indicators, specifically with rule of law, voice and accountability, government efficiency and all of the democratic variables. Policy transparency is mostly associated with the political variables, democracy, autocracy and polity score. The least significant correlation can be seen at political transparency, which is affected by voice and accountability and also inflation history. Procedural and operational transparency display similar patterns, showing strong relations to voice and accountability and all of the political variables as well. The inflation history plays an interesting and somewhat unstable role in our models, being sometimes significant (economic, political transparency) but most of the time negatively correlated with the explained variable.

All in all, there are some deviations and differences in significances across individual components of transparency. Some of the relationships are intuitive and confirm the general results, some of them need deeper examination and explanation. However, looking at the whole picture, we can imply that there is a great amout of consistency in the estimated coefficients.

Chapter 4

Financial Stability Transparency

The financial stability transparency is closely related to the monetary policy transparency. Whereas monetary policy transparency denotes public disclosure of general policy of central bank, transparency regarding financial stability means openness about financial stability issues, which contains primarily construction and publishing of financial stability reports. Therefore it is important and beneficial to analyse this type of transparency in order to gain deeper understanding of central bank's actions.

The main theoretical aspects of the transparency in the area of financial stability were described in the first part of this thesis. In this chapter we examine what actually determines the level of this transparency and its main drivers. As already mentioned, the issue of financial stability transparency was analysed in detail by Horvath & Vasko (2012). They constructed the Financial Stability Transparency index and examined which factors affects its values as a whole. Our work is based on this paper, utilizing gained knowledge and extending it significantly. In contrast to the original study, we examine not only the index as a whole, but we break it up to its components and find determinants for them. These sub-components capture different aspects like publishing financial stability reports, their coverage, frequency or disclosure of stress tests. Another our contribution is inplementing the presence of financial crisis to the model, which could be a significant factor for financial stability

transparency.

4.1 Index of transparency regarding financial stability

In order to examine financial stability transparency, we need to have some measure of it. The most comprehensive measure was constructed by Horvath & Vasko (2012) in their paper *Central Bank Transparency and Financial Stability: Measruement, Determinants and Effects*. Before any analysis it is appropriate to describe it first. The financial stability transparency index was gatheres for period 2000-2011 for 110 countries. This coverage was set intentionally so that it is in line with the coverage of monetary policy transparency index, which will be useful in following analysis. Technically, the index is a sum of 12 sub-components of transparency, they are as follows:

- the publication of the financial stability report (FSR);

- frequency of the publication of the FSR;

- the forward looking feature of the FSR;

- the coverage of the FSR:

    - macroeconomic environment and its risks;

    - deposit takers information and risks;

    - other market information and risks;

- the explicit statement in the central bank act that financial stability is its goal;

- macro-prudential policy transparency

- the existence of a financial stability committee

- the publication of stress test;

- the publication of financial soundness indicators

- a separate section on the central bank's website denoted to financial stability

- a database of speeches about financial stability on the central bank's website. (Horvath & Vasko 2012)

These individual aspects can be divided into several groups according to their focus. First four items concern the financial stability reports and their content. The publication of FSR itself is worth one point, if there is no FSR published the central bank receives zero. Countries without FSR cannot obviously score any points in another three categories. The number of countries publishing reports on financial stability has been constantly increasing since 2000, in 2011 the total number was 64. Frequency of FSR publication is another category, central bank earn half point for annual reports and one point for semi-annual or more frequent publications. Figure 4.1 depicts the total number of central banks that disclose FSRs and those with higher frequency. According to third category, a point is assigned to the country if FSR includes outlooks and forecasts of risks. The coverage of the FSR indicates whether all impotant sectors of economy are included in the report.
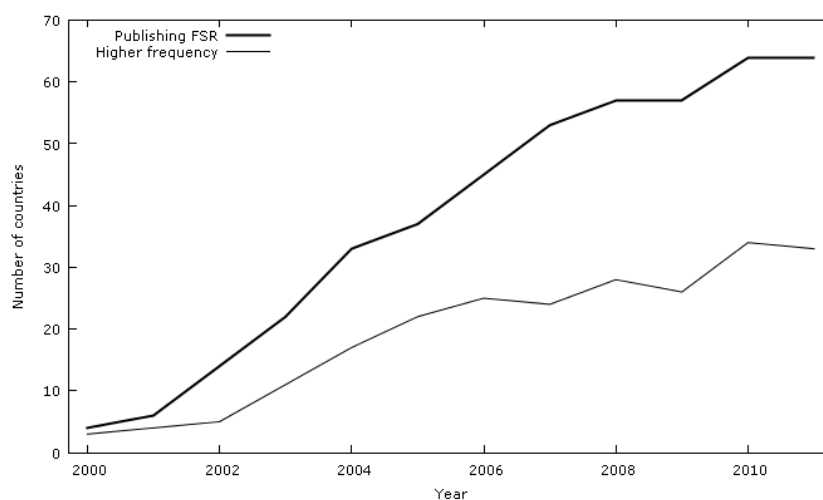
Figure 4.1: Countries publishing FSR
Source: own scheme

Another three categories can be grouped into so called general framework. First item asks whether a central bank clearly states in its act that it is responsible for the financial stability. Even though this duty could seem as natural for all central banks, only a little less than half of central banks actually does so. Interestingly, 28 central banks does not mention financial stability in its documents at all and earns the total FST score of zero. The macro-prudential policy transparency has also two stages. If it is mentioned in FSR, central bank earns half point, if the important information about crisis management are described, it obtains one point. As results suggest, central banks are not very succesful in this category with the average of 0.17. Another item underlying the overall FST index concerns the existence of seperate committee for financial stability. The existence of committee sends a positive signal to third parties that there is a seperate institution which is really resposible for promoting financial stability of the country. Despite this fact, only three countries scored a point in this category by having such committee.[1]

Next category describes tests and indicators published by the central bank. The public disclosure of stress tests indicates if local financial sector is strong enough to resist potential crisis or shocks. Once again the frequency of disclosure is taken into consideration, scoring half point for annual reports and one point for more frequent information. In 2011 almost one third of all countries scores one point. The financial soundness indicators (FSIs) were developed by IMF and are valuable in assesing the current state and performance of financial institutions. FSIs contain a large number of categories which are divided into core set and encourage set. For the purposes of FST index, the publication of core is assigned with half point, publication of encourage set is assigned one point. In 2011, only 12 countries published a core set in the central bank act.

The fourth group of indicators deals with the central bank's website and what is actually disclosed there. Website should serve as a valuable source of information about financial stability. The first indicator captures if there is

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[1]Ireland, Portugal and United Kingdom.

a seperate section on the central bank's website dedicated to financial stability. Here all the important information should be at disposal, primarilly what financial stability actually is and what specific actions does the central bank take in order to promote it. Approximately one third of all countries have the seperate website section, which is quite surprising in the age commanded by internet technologies. More detailed description of the individual components can be found in Horvath & Vasko (2012).

As we can see, every individual category deals with slightly different aspect of financial stability transparency. Every one of them has its important function, which is in a sense irreplaceable. Together they build a strong index which is comprehensive enough to indicate real level of transparency.

The detailed results with all countries and index values for 2011 can be found in Table B.1. The general look at the ranking indicates that economically more developed countries tend to be more transparent in their financial stability policy. This relationship is illustrated in Figure 4.2, where financial stability transparency index is depicted against GDP per capita of the country. The results are quite tight, five central banks lead the ranking with index value of 8.5 out of maximum 11. These countries are Czech Republic, Hungary, Japana, Norway and United Kingdom. These are followed by another countries mostly from Western and Northern Europe and Australia. On the other hand, the least transparent central banks are from Africa, Western Asia and some of the small islands.

To compare financial stability results with those of monetary policy transparency, we clearly see strong correlation. Regions with high transparency of central banking tend to be also more transparent regarding financial stability. These observations are consistent with the theoretical backgrounds of this relation, including consistency in communication with public.
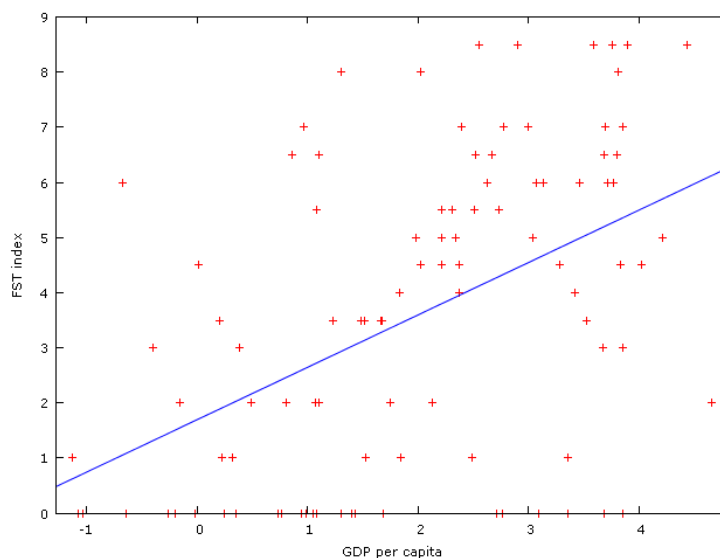
Figure 4.2: Financial stability transparency against GDP per capita
Source: own scheme

4.2   Factors influencing FST

This section presents our further results about financial stability transparency. We attempted to find significant factors that influences the amount of information central bank communicates with the public.

The methodology is based on Horvath & Vasko (2012), who estimated fixed effect models for financial stability transparency index. However, our work is different in a number of ways and contributes to the current state of knowledge. Unlike them, we are not going to use the stress index proposed by Cardanelli et al. (2009), which is available only for 43 countries until 2009. Instead of it, we incorporate a new variable capturing the appearance of financial crisis in individual countries. Our assumption is that if a country goes through a significant crisis of financial sector, it will have an effect on the way central bank communicate about financial stability. Moreover, we expect that the quality of government should have a positive impact on the transparency regarding financial stability. These are main hypotheses we attempt to test in this section.

4.2.1   Model description

We carry out a regression analysis, where the financial stability transparency index is the main explained variable. We regress it on a specific set of explanatory variables which we think could have a significant impact on transparency. The original work by Vasko (2012) used fixed-effects model, but for this analysis we are going to use simple OLS regression with cross section data. One of the reasons for that is a variable for financial crisis. Due to main feature of this variable it remains constant over the whole examined period, therefore it would make no sense to implement it in panel data. Moreover, this variable is of our great interest and we do not want to ommit it. Panel data are examined in the following chapter.

In our model we regress financial stability transparency index on a number of explanatory variables:

- monetary policy transparency index - first introduced by Dincer & Eichengreen (2009) and later updated up to 2011;

- past financial crisis variable

- GDP per capita as a proxy of economic development of the country

- rule of law as a proxy of government quality

- past inflation

- market capitalization

The relationship between monetary policy transparency and financial stability transparency was discussed by Vasko (2012). Correlation of these two variables is significantly positive which confirms simple intuition. The direction of causality between them is not trivial, nevertheless can be deduced using logic. Central banks became aware of transparency about its general decisions much earlier than regarding financial stability. As discussed in the first part of this thesis, the field of financial stability transparency is considerably younger than

monetary policy transparency. Secondly, it is empirically shown that monetary policy index usually increases first, and when it reaches certain level, central bank starts to care about transparency regarding financial transparency. These arguments suggest that the causality goes from monetary policy transparency to the financial stability transparency. (Vasko 2012)

Another variable incorporated into model is cumulative count of financial crisis in certain country since 1990. This variable is based on the database of systemic banking crises compiled by Valencia & Laeven (2012). The database includes all systemic banking, currency and sovereign debt crisis during the period 1970 - 2011. Only systemic crises are inlcluded in the database. The banking crisis is defined as systemic if these two conditions are met:

1. There have to be signs of financial distress in the banking system. To those signs belong losses in the banking systems, bank runs or liquidations.

2. Significant banking policy interventions have to be carried out as a response to significant losses.

According to definition of Valencia & Laeven (2012), the crisis become systemic in a first year when both of above mentioned conditions are met. In order to have as specific definition as possible, significant interventions are also defined. The banking policy intervention become significant if at least three of following measures have been implemented:

1. bank restructuring costs - at least 3 percent of GDP

2. extensive liquidity support - 5 percent of nonresident deposits and liabilities

3. significant guarantees

4. significant bank nationalizations

5. significant asset purchases - at least 5 percent of GDP

6. deposit freezes or bank holidays

More detailed description of all the conditions can be found in Valencia & Laeven (2012). It is noteworthy to say, that we do not include data from the whole period in our model, since financial crisis in 1970s are not assumed to affect financial stability transparency in 2011. Therefore we analyzed only those downturns which took place from 1990 up to now. We counted financial crisis from this period for every country and constructed the variable of cumulative count of these crisis. From our sample 65 countries went through some crisis of financial sector, 10 countries experienced two crisis.

Additionally, we include GDP per capita and a chosen variable from world's government indicators, rule of law. We assume that these variables should be positively associated with the financial stability transparency. We also use in our model past inflation and market capitalization as a proxy for the level of development of financial markets. For robustness analysis we incorporate dummies for the membership in EU and OECD.

Since we expect causality to go towards the FST index, we include all of the explanatory variables lagged by one year, i.e. for year 2010. This is because we assume that for example inflation or rule of law influence the transparency in the next year, not in the same year. Also potential reaction of the economy to some changes in variables could take some time. The exception to this rule is the variable of past financial crisis, since this variable is constant throughout the whole period.

Indeed, we performed the same regression without a lag in all variables in order to compare them. We found out that the model with lagged variables has a higher R squared and seems to better explain the transparency index. This observation also confirms that the response of central bank transparency policy to other variables really takes some time.

Table 4.1: Determinants of FST index 2011, lagged variables

	(I)	(II)	(III)	(IV)
Constant	-0.18	0.88	0.70	1.30
	(-0.35)	(1.39)	(0.90)	(1.26)
MPT index	0.28***	0.24***	0.23**	0.20*
	(2.97)	(2.65)	(2.57)	(1.88)
GDP p.c.	0.37*	0.35*	0.37**	0.36*
	(1.72)	(-1.72)	(1.99)	(-1.80)
Financial crisis	1.47***	1.65***	1.63***	1.29***
	(3.89)	(4.49)	(4.42)	(2.86)
Rule of law		1.31***	1.60***	1.68***
		(3.14)	(3.42)	(3.17)
Past inflation			0.05	0.04
			(0.89)	(0.63)
Market capitalization				0.0005
				(0.27)
Observations	99	99	98	85
R-squared	0.58	0.60	0.62	0.57

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

4.2.2 Discussion of results

In Table 4.1 we can found results of the regression described above. From the estimated coefficients we can clearly see that higher transparency of central bank's actions implies higher transparency regarding financial stability. Another obvious observation suggest that countries on higher economic level display higher transparency in their communication on financial stability issues. Interestingly, the presence of past systemic financial crisis has a positive impact on financial stability transparency. The intuition behind this results could lie in a learning effect of financial crisis. If a country goes through a financial distress, its central bank recognizes its negative impacts on the economy and does not want to let it happen again. Accordingly, the central bank changes its policy regarding financial stability in the direction of higher stability. This policy framework comprises the appropriate actions as well as communication with other institutions and public. The publications become more comprehensive and frequent and the financial stability transparency as a whole increases.

Higher government quality proxied by rule of law has also a positive impact on transparency regarding financial stability. Rule of law is signicant in all regressions and its coefficient is strongly positive. In fact, rule of law captures the extent to which institutions have confidence in society rules and how much they obey them. It takes into account the quality of police, contract enforcement or courts. Therefore, the positive relationship between rule of law and communicating of central bank about financial stability couls be in line with its definition. If central bank has trust in laws and rules and is enforced to obey them, it is more likely to display higher transparency about financial stability issues.

Other variables do not reach required significance on any relevant confidence level. Therefore past inflation does not affect the transparency in the area of financial stability. This result can be explained in two ways. First, inflation variations are not so high in order to influence the policy of central bank regarding financial stability. Moreover, financial stability transparency (including disclosure of financial stability reports) should be probably more influenced by government and policy variables, than by macroeconomic indicators. Indeed, our results confirm this suggestion. Market capitalization, as a proxy for the importance of financial markets, is also not significantly associated with the finanial stability transparency.

4.3   FST components and their drivers

To obtain even deeper level of knowledge, we examined the individual subcomponents of FST index. The decomposition of the index is illustrated in Figure 4.3. To briefly summarize the results, 64 central banks published the financial stability report in 2011 (out of 110). From these, 34 countries published FSR semi-annually or more frequently, the rest annualy. The coverage score indicates that approximately half of countries publishing FSR included all three important sectors in it, another half only two of them. Interestingly, only 26 countries included forecasts of risks in their FSR.

FST index decomposition			
Financial Stability Reports (4.5 points)	**General framework (3 points)**	**Tests and indicators (2 points)**	**Websites (1.5 points)**
• Publishing of FSRs • Frequency of FSRs • Forward looking FSR • FSR coverage	• Financial stability as a main goal • Macroprudential policy	• Stress tests • FSIs disclosure	• Web section for FS • Speeches database

Figure 4.3: The individual subcomponents of FST index
Source: own scheme

We performed another set of regressions in order to analyse the determinants of the individual FST index components. Because each of four groups of indicators (financial stability reports, general framework, tests and indicators and website) captures different aspects of transparency, we can reasonably expect that each of them will be drived by different factors. Therefore we summed the indicators under each of the group and regress them on the set of explanatory variables similar to the previous one. The exception is cumulative crisis variable, which is constant for the whole period. Since we used panel data for this analysis, including this variable does not make sense. Therefore we included the stress index, just the same as Horvath & Vasko (2012).

The complete list of explanatory variables includes monetary policy transparency index, GDP per capita, financial stress index, rule of law, inflation targeting dummy and market capitalization. Once again, Hausmann test and the test for common intercepts indicated that the appropriate model for us is the fixed effects model with seperate intercepts for all variables.

The regression results for the *Financial Stability Reports* are available in Table 4.2. We can see that higher transparency on monetary policy issues implies higher probability of publishing reports on financial stability, including its coverage and frequency. The economic level of a country is also positively

Table 4.2: Drivers of FSRs publishing, fixed effects, one year lags

	(I)	(II)	(III)	(IV)
Constant	-1.64***	-1.56***	-1.62***	-1.56***
	(-4.37)	(-2.90)	(-2.96)	(-2.78)
MPT index	0.35***	0.35***	0.34***	0.34***
	(7.00)	(6.94)	(6.35)	(6.36)
GDP p.c.	0.05***	0.05***	0.05***	0.05***
	(5.13)	(5.12)	(5.15)	(5.16)
Financial stress	-0.07***	-0.07***	-0-07***	-0.07***
	(-2.92)	(-2.92)	(-2.84)	(-2.84)
Rule of law		-0.11	-0.13	-0.12
		(-0.22)	(-0.25)	(-0.24)
IT dummy			0.30	0.30
			(0.63)	(0.62)
Market capitalization				-0.001
				(-0.54)
Observations	387	387	387	387
R-squared	0.75	0.75	0.75	0.75
FE test p-value	$1.27e^{-64}$	$2.12e^{-64}$	$7.32e^{-63}$	$7.44e^{-59}$

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

associated with the FSRs activities. On the other hand, past financial stress has a negative impact on financial stability reporting. We did not find any significant relationship between rule of law and FSRs, other variables are also not significant.

Table 4.3 depicts results for the group of indicators called *General framework*. Since only three countries does have a specialized financial stability committee, our analysis deals mainly with the explicit statement of the financial stability as a goal and transparency about macro-prudential policy. As our results suggest, monetary policy transparency and GDP per capita are again positively associated with the general framework transparency. Interestingly, the coefficient of financial stress is significant and positive. In other words, the occurance of financial stress imply higher transparency in the two areas mentioned above. The interpretation of this result is quite intuitive. Responsible central banks who went through financial distress are more aware of the im-

Table 4.3: Drivers of general framework, fixed effects, one year lags

	(I)	(II)	(III)	(IV)
Constant	0.39***	0.36***	0.37***	0.40***
	(5.63)	(3.56)	(3.64)	(3.87)
MPT index	0.02**	0.02**	0.02**	0.03**
	(2.33)	(2.37)	(2.51)	(2.57)
GDP p.c.	0.005***	0.005***	0.005***	0.005***
	(3.28)	(3.19)	(3.12)	(3.21)
Financial stress	0.009**	0.009**	0.009**	0.007***
	(2.16)	(2.16)	(2.07)	(1.41)
Rule of law		0.05	0.06	0.06
		(0.53)	(0.58)	(0.61)
IT dummy			-0.07	-0.08
			(-0.83)	(-0.84)
Market capitalization				-0.0005
				(-1.45)
Observations	387	387	387	387
R-squared	0.93	0.93	0.93	0.93
FE test p-value	$1.84e^{-171}$	$2.09e^{-169}$	$8.82e^{-168}$	$2.68e^{-165}$

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

portance of financial stability than the others. Therefore they are more likely to publicly declare that financial stability is their main goal.

The rule of law coefficients are positive, however they are not significant, that's why its informational value is not very high. Other variables does not have a significant impact on the general framework transparency.

Results of the regression for *Tests and indicators* are summarized in Table 4.4. Since only 12 countries published their core set of financial soundness indicators, the majority of this group is comprised of the publication of stress tests. As in the previous cases, monetary policy transparency and the overall economic level measured by GDP per capita are significant and positively associated with the transparency regarding stress tests. In the contrast to general framework and FSRs, rule of law is significant for the stress tests disclosure. The higher the rule of law, the higher probability that a central bank will communicate with public about its stress tests. Therefore quality of government

Table 4.4: Drivers of tests and indicators, fixed effects, one year lags

	(I)	(II)	(III)	(IV)
Constant	-0.55***	-0.84***	-0.78***	-0.89***
	(-4.45)	(-4.72)	(-4.34)	(-4.95)
MPT index	0.06***	0.07***	0.08***	0.08***
	(3.85)	(4.08)	(4.50)	(4.44)
GDP p.c.	0.02***	0.02***	0.02***	0.02***
	(7.09)	(6.83)	(6.71)	(6.57)
Financial stress	0.006	0.006	0.005	0.01*
	(0.77)	(0.81)	(0.61)	(1.71)
Rule of law		0.38**	0.40**	0.40**
		(2.23)	(2.34)	(2.31)
IT dummy			-0.31*	-0.30*
			(-1.94)	(-1.95)
Market capitalization				0.002***
				(3.13)
Observations	387	387	387	387
R-squared	0.68	0.69	0.69	0.70
FE test p-value	$1.23e^{-55}$	$2.61e^{-56}$	$1.56e^{-55}$	$1.70e^{-56}$

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

matters in this case.

Moreover, other variable are also significant on appropriate confidence levels. Inflation targeters tend to be more transparent about financial tests and indicators, and countries with higher importance of financial sector display higher transparency as well.

Besides analyzing the the grouped variables, we also performed the regressions of the individual components. Complete results and coefficients are upon request. Generally spoken, the estimated coefficients confirms our results and intuitions above. Looking at Financial Stability Reports, the significances of variables are more or less the same as in the grouped model. Nevertheless, coefficients suggest that FSR coverage is not influenced by stress index and it is positively associated with market capitalization, which is different from the comprehensive model. On the other hand, we observe that a forward looking feature of financial stability reports is not affected so much as other indica-

tors. In fact, the only significant variable here is monetary policy transparency index. Turning to our original results, the dependencies are relevant for FSR publication, frequency and coverage, but does not explain the probability that the report is forward looking.

Next we examine the general framework indicators. Financial stability as a goal of the central bank has similar coefficients as the grouped model. On the other hand, the macro-prudential policy is not influenced by the stress index, but it is negatively impacted by rule of law.[2]

As other results suggest, the publication of financial soudness indicators does not have significant association with explanatory variables except monetary policy transparency and GDP per capita. The stress test disclosure displays on the other hand similar results as the regression of *Tests and indicators*. Therefore the observed relationships are valid primarily for stress tests.

To conlude this chapter, we examined the transparency regarding promoting financial stability and its determinants. We found out that FST index is influenced positively by monetary policy transparency and economic development of the country proxied by GDP per capita. Moreover, FST index is also positively affected by the occurance of past systemic financial crisis since 1990. The rule of law is also positively associated with the financial stability transparency. We also examine the individual components of FST index and observed that although MPT index and GDP per capita infleunce all of the indicators, there are differences in determinants among FST index components.

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[2]The intuition behind this observation is not very well obvious.

Chapter 5

Conclusion

The transparency about monetary policies has become a widely discussed issue in last two decades. Since central banks are more influential than in the past, the requirements for openness about their outlooks and strategies are more demanding in order to maintain sufficient accountability. In addition to that, we clearly observe an increasing trend in monetary policy transparency over last 15 years. Higher transparency enhances monetary policy effectiveness, reduces uncertainty in financial markets and improves social welfare. On the other hand, excessive transparency can disrupt communication with the public and cause confusion of market agents. The evidence on transparency consequences is relatively new and many countries are just at the beginning of the transitional process to higher transparency.

The first aim of the thesis was to evaluate the statistics of central banking transparency using new updated dataset until 2011 and to find its determinants. For our purposes we used the monetary policy index for the period 2000-2011 covering 110 countries. As another contribution we addressed the issue of endogeneity of our data. In other words, we clarified that the causality of our model goes towards the transparency.

Our results verified the trend of increasing transparency suggested by previous studies and showed the latest development in individual countries. From 2000 to 2011, the openness about central bank's policies increased in the vast

majority of countries, only three central banks displayed a slight decrease. Consistently with our intuition, we found out that countries with higher economic development (proxied by GDP per capita) and those with more flexible exchange rates tend to be more transparent about their monetary policies. Moreover, stable political institutions and government quality have also a positive significant effect on the transparency, as well as democratic political system in the country. On the other hand, we did not find a significant association between previous succesful monetary policy (measured by inflation) and the transparency index. To conclude results of the decomposited monetary policy index, GDP per capita and exchange rate regime affects all of the sub-components, the significance of other variables differs across individual sub-indices.

The second part is denoted to the financial stability, which has become a very sensitive topic after the financial crisis 2007-2009. Central banks are making efforts to implement the most effective macroprudential policies in order to maintain financial stability. As described in the theoretical part, sufficient communication about these measures to the public has an important stabilizing effect on financial markets.

The aim of our analysis was to evaluate the recent trends in transparency regarding financial stability. For this purpose we used the Financial Stability Transparency index covering 110 countries and updated until 2011. To extend previous studies, we examined possible determinants of the financial stability transparency. As a major contribution to the existing literature we performed a detailed analysis of the decomposed FST index. The index is comprised of 12 sub-components that can be divided into four groups according to the issue they capture. We described basic results of these sub-indices and determined their drivers. As another extension we took into account past systemic banking crisis and government quality in our model.

The results indicate that the transparency about financial stability issues has been constantly increasing. In 2011, more than sixty countries published regularly the Financial Stability Report, which is the basic form of the financial

stability communication. The highest scores in FST index were achieved by countries from Western and Northern Europe and Australia region. The regression results suggest that monetary policy transparency has a positive impact on the financial stability transparency. This observation confirms the theoretical knowledge of the close correlation between these two types of transparency. The economic level of the country is also positively associated with FST index, as well as the occurance of past systemic crisis of financial system. The explanation could be that central banks with the experience of financial distress are more aware of financial stability than the others. Moreover, rule of law is also a positively significant determinant of financial stability transparency.

Turning our attention to the components of the FST index, we observed several variations in their drivers. Monetary policy transparency and GDP per capita are positively associated with all of the sub-components, which indicates the strength of their influence. Past financial stress has a negative effect on the publication of FSR. On the other hand, it has a positive effect on the publication of financial stability as a main goal of central bank and transparency about macroprudential policies. This result also support higher awareness of countries struck by crisis. In the case of tests and indicators, government efficiency matters. The higher the rule of law, the higher the probability that a central bank will communicate with the public about its stress tests. Inflation targeting and higher importance of financial sector have also a positive impact on the transparency about tests and indicators.

To conclude our discussion, transparency about monetary policies and financial stability are quite closely related to each other. Since this field of study is still young, the majority of countries are still in the developing phase of central banking transparency, especially regarding financial stability. However, the importance of the communication with the public is confirmed both by theoretical papers and by empirical evidence. We can expect that more central banks will gradually work on their macroprudential policies ensuring financial stability and will be more open about them in the future.

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Appendix A

Monetary Policy Index overview

Table A.1: MPT index, complete list

Country	MPT	Change	Country	MPT	Change
AFRICA	**4.65**	**0.97**	**Northern America**	**7.67**	**0.33**
Eastern Africa	**3.93**	**1.07**	Bermuda	1	0
Ethiopia	1	0	Canada	10.5	-1.5
Kenya	6	0.5	USA	11.5	1.5
Malawi	2.5	0			
Mauritius	6.5	1	**OCEANIA**	**7.64**	**0.79**
Rwanda	3	1.5			
Uganda	5.5	3	**Australia & New Zealand**	**12.5**	**1**
Zambia	3	1.5	Australia	10	1
			New Zealand	15	1
Norhtern Africa	**3**	**0.5**			
Egypt	3.5	1	**Melanasia**	**4**	**0.63**
Libya	1	0	Fiji	5	1
Sudan	3	1	Papua New Guinea	5.5	0.5
Tunisia	4.5	0	Solomon Islands	1.5	-0.5
			Vanuatu	4	1.5
Southern Africa	**8.33**	**1.17**			
Lesotho	5.5	1	**ASIA**	**5.84**	**1.02**
Namibia	9	1			
South Africa	10.5	1.5	**Central Asia**	**5**	**1**
			Kazakhstan	6	0.5
Western Africa	**4.83**	**1.17**	Kyrgyzstan	6	1
Ghana	6.5	1	Tajikistan	3	1.5
Nigeria	4.5	0.5			
Sierra Leone	3.5	2	**Eastern Asia**	**8**	**1.3**
			China	5	0.5
AMERICAS	**5.75**	**0.65**	Hong Kong	9	1.5
			Japan	11	1.5
East Caribbean	**4.17**	**0.42**	Korea	10.5	2
Aruba	1.5	1	Mongolia	4.5	1
Bahamas	4.5	0			
Barbados	4.5	0.5	**Southern Asia**	**4.7**	**0.8**
Cuba	1.5	-1	Banglades	4.5	1
Jamaica	7	1.5	Bhutan	3.5	0.5
Trinidad & Tobago	6	0.5	India	3	1
			Pakistan	4	0
Central America	**4.25**	**-0.13**	Sri Lanka	8.5	1.5
Belize	4	1			
El Salvador	0	-3	**South-Eastern Asia**	**8.4**	**0.7**
Guatemala	7	1	Indonesia	10	1.5
Mexico	6	0.5	Malaysia	6.5	1
			Phillipines	10.5	0.5
South America	**7.14**	**1.43**	Singapore	6.5	0
Argentina	6.5	1	Thailand	8.5	0.5
Brazil	8	0.5			
Chile	8.5	1	**Western Asia**	**5.25**	**1.75**
Colombia	8.5	3.5	Armenia	6.5	2.5
Guyana	2	0.5	Bahrain	4	1
Peru	10	2	Georgia	9	5
Uruguay	6.5	1.5	Iraq	3	0.5

MPT index, complete list (continued)

Country	MPT	Change	Country	MPT	Change
Israel	11	1	Russia	4.5	2
Jordan	2.5	0.5	Ukraine	3	0
Kuwait	2.5	0.5			
Oman	2.5	1	**Northern Europe**	**9.07**	**0.82**
Qatar	4	1	Denmark	6	0
Saudi Arabia	1	1	Iceland	9	1
Turkey	11	0	Latvia	6.5	0.5
UAE	2	1	Lithuania	6	1
Yemen	1.5	0.5	Norway	9	1
			Sweden	14.5	0
EUROPE	**9.01**	**0.4**	United Kingdom	12.5	0
Eastern Europe	**7.78**	**1.03**	**Southern Europe**	**5.25**	**0.08**
Belarus	6	1	Albania	7.5	1.5
Bulgaria	5.5	0	Croatia	3	0.5
Czech Republic	11.5	0.5			
Hungary	11.5	1	**Western Europe**	**11**	**0.1**
Poland	11	2	Eurozone	11	0
Moldova	9	3	Switzreland	11	1.5
Romania	8	1			

Table A.2: MPT index, regions (weighted averages)

Region	MPT average	Region	MPT average
Africa	**6.4**	**Asia**	**7.39**
Eastern Africa	4.35	Central Asia	6.25
Northern Africa	2.81	Eastern Asia	8.71
Southern Africa	9.96	Southern Asia	2.98
Western Africa	5.64	South-Eastern Asia	8.62
		Western Asia	5.64
Americas	**9.48**		
		Europe	**10.74**
East Caribbean	4.5		
Central America	5.5	Eastern Europe	6.42
South America	7.4	Northern Europe	11.69
Norhern America	9.83	Southern Europe	5.25
		Western Europe	10.82
Oceania	**9.72**		
Australia and New Zealand	10.34		
Melanesia	5.61		

Table A.3: Determinants of MPT index, cross section, 2000-2011 averages

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Constant	-2.58	-5.40**	-2.44	-0.72	-6.05***	-7.23***	-6.34***
	(-0.93)	(-2.02)	(-1.12)	(-0.25)	(-2.88)	(-3.55)	(-3.10)
Past inflation	-1.27	-1.86	-1.70	-0.78	-2.11	-0.42	-1.62
	(-0.65)	(-0.20)	(-0.28)	(-0.12)	(-0.80)	(-0.07)	(-0.58)
GDP p.c.	0.55*	0.85***	0.53**	0.33**	0.80***	1.17***	0.94***
	(1.87)	(2.91)	(2.29)	(1.08)	(3.50)	(5.34)	(4.29)
Fin. depth	0.007	0.01*	0.01*	0.005	0.01	0.01**	0.01*
	(1.08)	(1.80)	(1.97)	(0.77)	(1.61)	(2.20)	(1.76)
ER regime	0.39***	0.42***	0.34***	0.36***	0.31***	0.28***	0.29***
	(6.05)	(6.39)	(5.58)	(5.54)	(4.46)	(4.00)	(4.17)
RoL	0.98**						
	(2.33)						
PS		0.28					
		(0.84)					
VaA			1.33***				
			(4.54)				
GE				1.51***			
				(3.10)			
Democracy					0.29***		
					(4.30)		
Autocracy						-0.41***	
						(-4.83)	
Polity score							0.18***
							(4.60)
Observations	87	87	87	87	81	81	81
R-squared	0.58	0.55	0.64	0.60	0.63	0.65	0.64

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

Table A.4: Determinants of MPT index, fixed effects, one year lags

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Constant	-7.69*	-7.98	-8.62	-8.21	-7.87	-8.72	
	(-1.71)	(-0.98)	(-1.12)	(-1.24)	(-0.76)	(-0.42)	(-1.39)
Past inflation	0.002*	0.002	0.003	0.004*	0.002	0.003	0.003
	(4.12)	(2.87)	(2.19)	(3.10)	(2.54)	(2.87)	(2.39)
GDP p.c.	1.40***	1.52***	1.57***	1.64***	1.78***	1.92***	2.06***
	(2.75)	(2.69)	(2.91)	(2.39)	(2.40)	(2.12)	(2.86)
Fin. depth	-0.001	0.001	0.002	-0.001	0.001	0.001	-0.001
	(-0.29)	(0.13)	(0.17)	(-0.27)	(0.21)	(0.09)	(-0.16)
ER regime	0.004	0.005	0.001	0.001	0.13*	0.14*	0.14*
	(0.15)	(0.19)	(0.10)	(0.09)	(2.76)	(2.97)	(2.32)
RoL	-0.44*						
	(-1.67)						
PS		-0.56					
		(-1.49)					
VaA			0.001				
			(0.18)				
GE				-0.89			
				(-1.26)			
Democracy					0.03		
					(0.41)		
Autocracy						-0.001	
						(-0.10)	
Polity score							0.02
							(0.08)
Observations	608	608	608	608	592	592	592
R-squared	0.95	0.95	0.95	0.95	0.95	0.95	0.95
FE test p-value	$9.15e^{-201}$	$3.87e^{-189}$	$1.98e^{-109}$	$1.78e^{-164}$	$2.49e^{-129}$	$3.78e^{-128}$	$1.39e^{-125}$

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

Table A.5: Determinants of Economic transparency, cross section, 2000-2011 averages

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Constant	-2.32*	-1.57*	-1.54*	-2.72	-2.38*	-2.19*	-2.76
	(-1.81)	(-0.67)	(-1.23)	(-2.45)	(-3.98)	(-2.19)	(-2.84)
Past inflation	0.85	0.69	0.98	1.29	0.72	0.73	0.89
	(0.87)	(0.78)	(0.89)	(1.02)	(1.34)	(0.93)	(0.84)
GDP p.c.	0.37	0.28	0.53	0.48	0.27	0.36	0.18
	(5.38)	(4.89)	(4.82)	(5.02)	(3.78)	(4.02)	(5.23)
Fin. depth	0.0002*	0.001*	0.001*	0.002*	0.001*	0.001*	0.001*
	(0.11)	(0.75)	(1.48)	(1.28)	(1.98)	(1.34)	(2.02)
ER regime	0.07***	0.08***	0.06***	0.06***	0.07***	0.06**	0.06**
	(3.51)	(3.72)	(4.03)	(3.73)	(3.20)	(3.72)	(3.84)
RoL	0.27**						
	(1.99)						
PS		-0.04					
		(-0.4)					
VaA			0.23**				
			(2.28)				
GE				0.52***			
				(3.33)			
Democracy					0.04*		
					(1.29)		
Autocracy						-0.13	
						(-2.34)	
Polity score							0.14**
							(2.18)
Observations	86	86	86	86	79	79	79
R-squared	0.49	0.53	0.57	0.58	0.56	0.56	0.59

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

Table A.6: Determinants of Policy transparency, cross section, 2000-2011 averages

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Constant	-1.44	-2.38*	-2.18	-0.76	-2.84	-2.48	-2.13
	(-1.32)	(-2.29)	(-1.90)	(-0.87)	(-2.45)	(-3.86)	(-2.39)
Past inflation	-0.27	-0.38*	-0.28	-0.48	-0.21*	-0.43	-0.18
	(-0.18)	(-0.48)	(-0.53)	(-0.62)	(-0.47)	(-0.58)	(-0.38)
GDP p.c.	0.27**	0.18**	0.38**	0.27**	0.21**	0.12**	0.37*
	(3.87)	(2.98)	(4.28)	(3.10)	(4.78)	(5.29)	(3.10)
Fin. depth	0.001	0.002	0.001	0.003	0.001	0.002	0.001
	(0.12)	(0.37)	(0.27)	(0.17)	(0.02)	(0.12)	(0.26)
ER regime	0.07***	0.08***	0.06***	0.06***	0.07***	0.09***	0.06***
	(3.78)	(5.29)	(4.89)	(4.10)	(3.89)	(5.93)	(4.10)
RoL	0.12*						
	(1.46)						
PS		0.07					
		(0.52)					
VaA			0.16				
			(1.05)				
GE				0.25			
				(1.10)			
Democracy					0.06*		
					(1.21)		
Autocracy						-0.11***	
						(-2.65)	
Polity score							0.04*
							(1.95)
Observations	86	86	86	86	79	79	79
R-squared	0.51	0.52	0.56	0.55	0.57	0.57	0.57

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

Table A.7: Determinants of Political transparency, cross section, 2000-2011 averages

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Constant	-1.47*	-1.29	-1.89*	-1.39	-1.05*	-1.68	-1.39
	(-1.98)	(-1.48)	(-1.89)	(-1.83)	(-1.25)	(-1.94)	(-1.74)
Past inflation	0.38*	0.28*	0.83	0.62	0.19*	0.92	0.89
	(0.38)	(0.58)	(0.62)	(0.78)	(0.67)	(0.53)	(0.91)
GDP p.c.	0.48**	0.38**	0.29**	0.48**	0.43**	0.31**	0.59**
	(3.43)	(5.21)	(3.54)	(2.78)	(4.93)	(3.79)	(2.40)
Fin. depth	0.001*	0.002*	0.001	0.003	0.002*	0.004*	0.001
	(1.37)	(3.98)	(2.10)	(2.46)	(2.61)	(2.90)	(2.16)
ER regime	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***
	(1.46)	(2.36)	(2.01)	(2.35)	(2.12)	(1.98)	(1.67)
RoL	0.003						
	(0.02)						
PS		0.01					
		(0.09)					
VaA			0.13*				
			(0.80)				
GE				0.05			
				(0.35)			
Democracy					0.02		
					(0.86)		
Autocracy						-0.04	
						(-1.32)	
Polity score							0.01
							(0.92)
Observations	86	86	86	86	79	79	79
R-squared	0.26	0.26	0.25	0.28	0.31	0.32	0.31

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

Table A.8: Determinants of Procedural transparency, cross section, 2000-2011 averages

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Constant	-1.23*	-2.67*	-1.89*	-2.32*	-2.18*	-2.12*	-1.95*
	(-1.54)	(-2.87)	(-2.01)	(-2.46)	(-2.19)	(-2.89)	(-1.90)
Past inflation	-0.31	-0.67	-0.19	-0.78	-0.82	-0.91	-1.53
	(-0.43)	(-0.92)	(-0.48)	(-0.90)	(-0.91)	(-1.12)	(-1.73)
GDP p.c.	0.41**	0.62***	0.52**	0.42**	0.32**	0.38**	0.31**
	(2.34)	(2.78)	(3.29)	(2.94)	(3.01)	(2.16)	(2.76)
Fin. depth	0.001*	0.002	0.002*	0.001	0.001	0.001	0.001*
	(0.43)	(0.19)	(0.73)	(0.28)	(0.56)	(0.92)	(0.26)
ER regime	0.06***	0.05***	0.05***	0.07***	0.07***	0.07***	0.06***
	(3.21)	(2.12)	(2.98)	(3.56)	(4.12)	(4.87)	(4.10)
RoL	0.08						
	(0.45)						
PS		0.01					
		(0.07)					
VaA			0.21**				
			(1.45)				
GE				0.16			
				(0.78)			
Democracy					0.08**		
					(2.60)		
Autocracy						-0.08**	
						(-2.01)	
Polity score							0.05**
							(2.56)
Observations	86	86	86	86	79	79	79
R-squared	0.35	0.34	0.35	0.37	0.39	0.39	0.39

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

Table A.9: Determinants of Operational transparency, cross section, 2000-2011 averages

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Constant	-1.16*	-0.93*	-1.37*	-1.83*	-0.98*	-1.02*	-1.45*
	(-1.04)	(-0.42)	(-1.46)	(-2.01)	(-1.56)	(-1.37)	(-1.93)
Past inflation	0.46	0.89*	0.68*	0.62	1.27*	1.92*	1.48*
	(0.58)	(0.68)	(0.82)	(0.91)	(0.81)	(0.38)	(0.39)
GDP p.c.	0.24**	0.18**	0.38*	0.19*	0.27**	0.21**	0.38**
	(1.76)	(2.98)	(2.09)	(3.25)	(2.46)	(2.87)	(1.90)
Fin. depth	0.001*	0.002	0.002	0.003	0.001*	0.001*	0.002*
	(1.23)	(2.12)	(2.43)	(2.87)	(2.47)	(2.01)	(2.47)
ER regime	0.05***	0.06***	0.004***	0.04***	0.06***	0.06**	0.06***
	(2.43)	(2.98)	(3.01)	(2.84)	(2.19)	(2.47)	(2.10)
RoL	0.16						
	(0.97)						
PS		0.02					
		(0.19)					
VaA			0.39***				
			(3.2)				
GE				0.24			
				(1.17)			
Democracy					0.07***		
					(2.71)		
Autocracy						-0.08**	
						(-2.20)	
Polity score							0.04**
							(2.64)
Observations	86	86	86	86	79	79	79
R-squared	0.33	0.34	0.34	0.36	0.38	0.39	0.39

Note: t-statistics are in parentheses; *** denotes significance at 1% level, ** at 5% level, * at 10% level.

Appendix B

Overview of the FST index

Table B.1: FST index, complete list

Country	FST index	Country	FST index
AFRICA	**1.42**	**Northern America**	**1.5**
Eastern Africa	**1.79**	Bermuda	0
Ethiopia	0	Canada	4.5
Kenya	0	USA	0
Malawi	0		
Mauritius	4.5	**OCEANIA**	**3.17**
Rwanda	0		
Uganda	7	**Australia & New Zealand**	**7.5**
Zambia	1	Australia	7.5
		New Zealand	7.5
Norhtern Africa	**0**		
Egypt	0	**Melanasia**	**1**
Libya	0	Fiji	0
Sudan	0	Papua New Guinea	1
Tunisia	0	Solomon Islands	1
		Vanuatu	2
Southern Africa	**2.83**		
Lesotho	0	**ASIA**	**3.17**
Namibia	3.5		
South Africa	5	**Central Asia**	**2.33**
		Kazakhstan	5
Western Africa	**1.5**	Kyrgyzstan	2
Ghana	0	Tajikistan	0
Nigeria	3.5		
Sierra Leone	1	**Eastern Asia**	**4.9**
		China	3.5
AMERICAS	**2.13**	Hong Kong	6
		Japan	8
East Caribbean	**1.5**	Korea	5
Aruba	0	Mongolia	2
Bahamas	0		
Barbados	0	**Southern Asia**	**3.4**
Cuba	0	Banglades	3
Jamaica	3.5	Bhutan	0
Trinidad & Tobago	5.5	India	3
		Pakistan	4.5
Central America	**2**	Sri Lanka	6.5
Belize	0		
El Salvador	3.5	**South-Eastern Asia**	**2.9**
Guatemala	0	Indonesia	5.5
Mexico	4.5	Malaysia	2
		Phillipines	0
South America	**3**	Singapore	6
Argentina	5.5	Thailand	1
Brazil	4		
Chile	6.5	**Western Asia**	**2.77**
Colombia	4	Armenia	6.5
Guyana	0	Bahrain	5
Peru	0	Georgia	7
Uruguay	1	Iraq	0

FST index, complete list (continued)

Country	FST index	Country	FST index
Israel	1	Russia	5
Jordan	3.5	Ukraine	2
Kuwait	0		
Oman	0	**Northern Europe**	**6.4**
Qatar	5.5	Denmark	4.5
Saudi Arabia	0	Iceland	6.5
Turkey	6.5	Latvia	4.5
UAE	0	Lithuania	7
Yemen	1	Norway	8.5
		Sweden	8.5
EUROPE	**5.46**	United Kingdom	9.5
Eastern Europe	**6.42**	**Southern Europe**	**5.11**
Belarus	2	Albania	8
Bulgaria	1	Croatia	6
Czech Republic	8.5		
Hungary	8.5	**Western Europe**	**5.36**
Poland	5.5	Eurozone	5.87
Moldova	2	Switzreland	4.5
Romania	8		