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MASTER THESIS

**Influence of Culture on Macroeconomic
Stability**

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Declaration of Authorship

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

The author declares that the thesis has not been used for obtaining another degree.

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Prague, December 31, 2014

Signature

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Abstract

This thesis investigates the effect of individual countries' cultural characteristics on macroeconomic stability. Macroeconomic stability is a general concept that comprises the stable development of several economic parameters – inflation, government budget, external debt, gross domestic product, and others. The mainstream economics investigates these indicators usually as being shaped only by wealth, political stability and institutions. However recently, the economic literature reveals the relationship between some of the individual cultural characteristics – mainly trust – and macroeconomic (in)stability. This thesis is the first attempt to analyze the effect of complex set of cultural characteristics on macroeconomic stability. Through the lens of panel data regression it is shown that the macroeconomic stability is significantly affected by cultural characteristics. In particular, more individualistic countries tend to have lower macroeconomic stability. Furthermore, in countries where people feel stronger fear about uncertainty the macroeconomic stability is also weaker. On the contrary from the previous studies, the positive effect of higher trust on macroeconomic stability is not confirmed.

JEL Classification C33, E03, Z10, Z19

Keywords Macroeconomic stability, Cultural economics, Cultural characteristics, Hofstede, WVS, GLS

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Abstrakt

Tato práce zkoumá vliv kulturních charakteristik jednotlivých zemí na makroekonomickou stabilitu. Makroekonomická stabilita je obecným konceptem zahrnujícím stabilní vývoj některých ekonomických parametrů jako jsou inflace, státní rozpočet, vnější dluh, hrubý domácí produkt a další. Hlavní proud ekonomické teorie zkoumá tyto faktory jako by byly ovlivňovány pouze bohatstvím, politickou stabilitou a institucemi. V současné době se však ekonomická literatura začíná zajímat také o vztah mezi některými jednotlivými kulturními charakteristikami (hlavně pak důvěrou) a makroekonomickou (ne)stabilitou. Tato diplomová práce je prvním krokem k analýze vlivu komplexního souboru kulturních charakteristik na makroekonomickou stabilitu. Prostřednictvím regresní analýzy panelových dat zahrnujících kulturní proměnné je v této práci ukázán signifikantní vliv kulturních charakteristik na makroekonomickou stabilitu. Převážně pak země jejíž obyvatelé prokazují individualistické chování mají nižší makroekonomickou stabilitu. Dále v zemích, kde se lidé cítí více ohroženi nejistotami, je makroekonomická stabilita nižší. Oproti dosavadním zjištěním uvedeným v současné literatuře nebyl prokázán pozitivní vliv důvěry na makroekonomickou stabilitu.

Klasifikace JEL

C33, E03, Z10, Z19

Klíčová slova

makroekonomická stabilita, ekonomie kultury, kulturní charakteristiky, Hofstede, WVS, GLS

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Acronyms

GDP	Gross Domestic Product
GLS	Generalized Least Squares
EU	European Union
EVS	European Values Study
HDI	Human Development Index
IDV	Individualism Index
IMB	Macroeconomic Imbalance Index
ISI	Ismihan Index
IV	Instrumental Variable
LTO	Long-Term Orientation Index
MAS	Masculinity Index
MC	Maastricht Criteria
OLS	Ordinary Least Squares
PDI	Power Distance Index
UAI	Uncertainty Avoidance Index
WGI	Worldwide Governance Indicators
WVS	World Values Survey

Master Thesis Proposal

Author	Bc. Jitka Šenkýřová
Supervisor	PhDr. Jaromír Baxa, Ph.D.
Proposed Topic	Influence of Culture on Macroeconomic Stability

Topic Characteristics My thesis will be focused on determining the influence of individual country's cultural characteristics on its macroeconomic stability. It will be partly based on the findings from my previous research (Bachelors Thesis). Based on the literature and on my previous findings the cultural differences between nations affect productivity. In this Master Thesis I would like to test the influence of the suitable cultural characteristics (Hofstede's Dimension and World Value Survey) on macroeconomic stability.

The macroeconomic stability will be represented by macroeconomic (in)stability index which is composed of most important macroeconomic stability factors - inflation rate, public deficit (as ratio) and others. The composition of macroeconomic instability index is described in literature (Ismihan (2003), *The Role of Politics and Instability on Public Spending Dynamics and Macroeconomic Performance: Theory and Evidence from Turkey*, Ph.D. Thesis, METU, Ankara, December 2003). The basic model will be tested using linear regression analysis. Also I would like to run secondary regressions - to check the robustness of the variables' effect. Within the literature the correcting for the endogeneity bias is discussed. I will cover the endogeneity issue either through instrumental variables (as used e.g. in the paper of Sascha Buetzer, Christina Jordan and Livio Stracca, *Euro Area Imbalances: A Matter of Culture?*), or through employing panel vector autoregression techniques (e.g. in Bouhtane, Ekrame and Coulibaly, Dramane and Rault, Christophe, *Immigration, Growth, and Unemployment: Panel VAR Evidence from OECD Countries*. *LABOUR*, Vol. 27, Issue 4, pp. 399-420, 2013.), or through other suitable technique.

I will work with panel data. I will try to include more than 50 countries for

the period longer than 20 years. I will use the economic data from the World Bank database, the cultural data from Hofstede's research and World Value Survey.

The findings of the Thesis could outline the possible answers why some countries are experiencing worse macroeconomic instability when started at the same position as other.

Hypothesis

- (H1) Macroeconomic stability is influenced by cultural characteristics
- (H2) Long-term orientation has positive impact on macroeconomic stability.
- (H3) Trust has positive impact on macroeconomic stability.

Methodology The model will be tested using GLS technique. If it turns out that too many variables are relevant I will apply principle components method.

Outline

1. Introduction
2. Literature Overview
 - (a) Macroeconomic Stability
 - i. Inflation
 - ii. Budget Deficit
 - (b) Importance of Cultural Differences
3. Regression Analysis
 - (a) Specification of Data Used
 - (b) GLS regression

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Chapter 1

Introduction

Macroeconomic stability is not purely economic issue. Macroeconomic stability shapes the present and especially the future of the economy, it is very important for all countries. Stability represents advantage for countries as it gives the potential investors higher assurance of positive and smooth development of the country's economy. Stability, though, brings more money into the economy. It also helps local firms and inhabitants. The stable economy and the central bank's¹ projections which could be taken seriously calm local economically active subjects which can better plan their business. The macroeconomic stability has positive impact on the whole economy. Macroeconomic stability is a wide term which comprises stable development of several economic parameters – inflation, government budget, external debt, gross domestic product, and others. The mainstream economy investigates these indicators usually as being shaped only by wealth, political stability and institutions.

Cultural characteristics² should be taken into account when researching macroeconomic stability. Interestingly, number of recent research papers reveal that macroeconomic stability is driven not only by economic attributes but also by cultural characteristics. Factors like *trust between people* are important for overall stability (Bützer *et al.* (2013), Sangnier (2010)). Also other cultural factors should be considered as important. The current research reveals the relationship between cultural characteristics and economic indicators: long term orientation is correlated with economic growth, wealthier countries are usually associated with lower power distance³ and have exhibit more in-

¹or respective institution

²Also traits, or differences.

³One of the Hofstede's cultural dimensions which is further discussed in the following Chapters.

dividualistic tendencies (Hofstede *et al.* (2010)). Therefore it is reasonable to investigate the possible influence of not only trust but also by other cultural characteristics on macroeconomic stability.

In this thesis I investigate the effect of culture on macroeconomic stability. In recent years we have witnessed that culture plays an important role in the development of countries. During the current economic crisis (starting in 2008) the various effects could be observed depending on the conditions of each concrete country – serious situation in Greece and Spain, well managed crisis in Germany. These well known facts should lead us to the question whether the common cultural foundation of the people living in these countries – their common values, common behavior patterns – are the ultimate factors of these differences in macroeconomic stability. The cultural characteristics can be measured. There are two main sources – Hofstede’s cultural dimensions and World Values Survey (and similar European Values Study). Both are based on the complex, long-term surveys which involved many respondents.

Up to my knowledge the effect of World Values Survey (WVS) characteristics together with Hofstede’s cultural dimensions on the macroeconomic stability has not been studied yet. This thesis is the first analysis of the effect of complex cultural dimensions on macroeconomic stability. My main contribution is that I analyze the effect of complex cultural characteristics, not only of one of them. My main hypothesis is that cultural characteristics affect macroeconomic stability. The purpose of this thesis is not to set the perfect description of macroeconomic stability, but to reveal the possible relation between cultural characteristics and macroeconomic stability of individual countries.

Based on the findings of this thesis is the macroeconomic stability significantly influenced by some of the cultural characteristics. More individualistic societies tend to have lower macroeconomic stability. Individualism Index which captures individualistic characteristic of the country has significant⁴ positive influence ($\beta^{IDV} = 0,67$ with $P\text{-value} = 0,07$) on macroeconomic instability index. Countries where people feel stronger fear about uncertainty the macroeconomic stability is also weaker. Uncertainty Avoidance Index has significant⁵ positive influence ($\beta^{UAI} = 1,19$ with $P\text{-value} = 0,00$) on macroeconomic instability index. On the contrary from the previous studies (Bützer *et al.* (2013), Sangnier (2010)), the effect of higher trust on macroeconomic stability when

⁴At 10% significance level.

⁵At 1% significance level.

other cultural dimensions are employed and panel data used is negative. This could be viewed as a challenge for previous research (with positive effect of trust). In these studies the effect of single cultural characteristic trust was tested. And the data although they included time variable were treated as cross-sectional.

This thesis has the following structure. Chapter 1 introduces the thesis. The literature review of cultural economics is presented in Chapter 2. In Chapter 3 the importance of macroeconomic stability for countries is stressed and the variables that shape the stability are described. In the second part there is an empirical analysis. Chapter 4 includes the description of the data used in the empirical analysis and the explanation of the choice of the methodology utilized. In Chapter 5 the results of the empirical analysis are included and interpreted. In the final Chapter 6 all the main ideas and results of the thesis are summarized and discussed.

Chapter 2

Cultural Differences in Literature

2.1 Introduction to Culture

Economy has always been influenced mainly by natural resources, weather conditions and people. People and money are the main drivers of the recent economies. In the main stream of economic theories the economic actors' decisions, utilities, wealth and other factors are often analyzed. In modern theories such as behavioral economics, or human capital theory, the common characteristics of different groups are considered, especially educational attainment, gender and age. In mainstream economics the factor of cultural background is often neglected. Only the nascent field of economics – the cultural economics tries to investigate the effect of cultural characteristics of people and nations to economic variables. In cultural economics most of the studies analyze the effect of culture on economic output.

There are two main understandings of the word *culture*. The first explanation is that the culture represents “the arts and other manifestations of human intellectual achievement regarded collectively” and the second is “the ideas, customs, and social behavior of a particular people or society”. (Oxford-Dictionaries oxforddictionaries.com/definition/culture) Also the term *cultural economics* is used in these two ways. In this Thesis only the second explanation of the term is considered.

2.2 Cultural Economics

People see the world from their own subjective perspective. Most people assume that they behave “normally”, they naturally expect others to behave the same way. In economic theories and respective models the actors behave according to their preferences. Usually the fact that some groups of actors exhibit the same behavior (express same preferences, etc.) despite their different age, gender and education is neglected. The economists usually expect same preferences and behavior from actors (except risk averseness). Most of the mainstream economists of last decades came from the nations with European roots. That is probably also one of the reasons why such important factor as cultural background has been neglected for so long. “Modern neoclassical economics has, until recently, ignored the potential role of culture in explaining variation in economic outcomes, largely because of the difficulty in rigorously separating the effects of culture from those of institutions and traditional economic variables.”(Fernandez (2008)) “The set of economically relevant preferences that can be affected by culture is potentially very large.” (Guiso *et al.* (2006), p 37)

The foundation of each culture depends on many factors, such as geography and environmental conditions, historical development, local religion, institutions, etc. The cultures have been developing over entire history of human kind. (UNESCO (2001)) In the Handbook of Economic Growth the importance of culture in the historical development is stressed. In the section about the Industrial Revolution the author concerns as the fact that cultural differences played an important role during history. “Culture mattered to economic development how could it not?” (Mokyr (2005), p 61)

Very important determinants that shape the society are *institutions*. The importance of economic institutions is stressed in Handbook of Economic Growth. “Economic institutions matter for economic growth because they shape the incentives of key economic actors in society, in particular, they influence investments in physical and human capital and technology, and the organization of production.” (Acemoglu *et al.* (2004), p 2) Authors stress importance of institutions and high influence on society but they also mention that institutions are determined by society. “Institutions ... are endogenous, they are, at least in part, determined by society”(Acemoglu *et al.* (2004), p 2). The society determines the institutions, but also institutions determine the society. The

original driver might be society, as without it there would be no institutions and rules set. Nevertheless there is a mutual relationship.

The *efficiency* of various nations is very important in the explanation of the cross-country income differences. “Efficiency is at least as important as capital in explaining income differences” (Caselli (2004), abstract). The author Caselli summarizes that according to literature “differences in efficiency account for at least 50% of differences in per capita income.(Caselli (2004), p 2) These concrete values underline the importance of differences between nations. When country inhabitants work more efficiently it brings significant results. Different countries with different cultural characteristics reveal different efficiency of their behavior. E.g. there is an effect of the ability of employers and employees to discuss the decision to the efficiency of their work.

2.3 Broad Definition of Culture

There are many approaches to definition of culture and its important determinants in economics. In the literature the description of the culture (or social capital) mostly include the common *values*, *preferences* and *beliefs*, that are transferred within generations. (Durlauf & Fafchamps (2004), Fernandez (2011), Matsumoto (2002)) The precise dictionary definition states that culture is “the ideas, customs, and social behavior of a particular people or society”. (OxfordDictionaries oxforddictionaries.com/definition/culture) Another sources describe culture as something with what the different group could be distinguished. “Culture is ... the collective programming of the mind that distinguishes the members of one group or category of people from others.” (Hofstede *et al.* (2010), p 6) Definitions also stress that the culture is a heritage from previous generations. Culture is “the set of attitudes, values, beliefs, and behaviors shared by a group of people,..., communicated from one generation to the next”. (Matsumoto (2002)) The two most complex databases that comprise the cultural specifications and are most widely used in the literature resources are *Hofstede’s Cultural Dimensions* and *World Values Survey* (and in addition European Values Study) characteristics.

2.3.1 Hofstede's Cultural Dimensions

Gradual Development In 1970's the Dutch social psychologist Geert Hofstede introduced his work about the basic features of nations. Originally he collected data from the surveys done in IBM branches in more than fifty countries over the world. Hofstede pointed out several basic issues which he seemed as the most important for specifying the differences between nations. These areas were very similar to those specified in 1954 by Alex Inkeles and Daniel Levinson. Inkeles and Levinson defined these cultural features from a broad survey of English-language literature. Hofstede, assured by the other study, defined four basic problem areas of human societies called cultural dimensions – *Power Distance, Collectivism versus Individualism, Feminity versus Masculinity, Uncertainty Avoidance*.

Lately several studies further investigated this topic. The results of these studies were important as they verified the findings outside the IBM company. The key study that helped to prove the original findings is the survey of Michael H. Bond. Hofstede lately cooperated with Bond. They initiated the discussion about the countries of origin of authors of such studies. All researchers came from western countries – USA and Canada. Thus, the whole theory could have been biased as these people shared common values. Also there appears “data-driven theory” issue. The theory depends on the data from the surveys, but all questions that were asked during these surveys were prepared by the western-origin sociologists. What if some very important questions have never been asked and many irrelevant have?

In response Bond decided to asks his Chinese college professor for help. The professor with his team created another set of questions and executed their own survey. Based on this Chinese Value Survey four dimensions were estimated. Three dimensions were very similar to those specified by Hofstede but the fourth was novel. Professor Hofstede decided to extend original dimensions by this fifth dimension – *Long-Term versus Short-Term Orientation*.

Geert Hofstede also with his son Gert Jan Hofstede continued on this research. Bulgarian academic Michael Minkov in his work in 2000s detected three possible new dimensions. The Hofstede's team decided to integrate one of these dimensions into the Hofstede's Cultural dimension. And so the sixth dimension – *Indulgence versus Restraint* was created and also Minkov became part of the research group. (Overview is based on Hofstede *et al.* (2010), pp 29-45, 559)

Upper Practices and Core Values The Hofstede's conception of culture is well thought out. He pictured the cultural differences as the skin of onion. Where the first upper skin is represented by *symbols*, the second skin by *heroes* and the third one by *rituals*. These three upper skins represent *practices*. "The core of culture ... is formed by values", so the core of the imaginary cultural onion is represented by *values*. The position of each layer is based on its importance and transferability between cultural groups. The upper skins could be more easily copied from one group to another. The values are the core of the understanding – what is good, normal or moral (Hofstede *et al.* (2010), pp 8-9).

Culture Evolves but Values Stay The cultural characteristics are stable and constant or slowly and continuously developing over time. The world is constantly changing. New technologies bring new approaches. Technological development brings new possibilities. Due to traveling opportunities and internet the the world becomes "smaller". Also the culture and the cultural characteristics are evolving. "Culture change can be fast for the outer layers of the onion diagram, labeled practices. ... New practices can be learned throughout one's lifetime... acquiring new symbols, meeting new heroes, and communicating through new rituals." The three upper layers of the onion – practices – are changing but the core – values – is stable. The values are stable because they are deep in us, we have learned them in childhood and we do stick to them. (Hofstede *et al.* (2010), pp 18-20) Professor Hofstede confirms that the values of his (and his team's) dimensions are stable. He states that although the national cultures may change, the differences between different cultures stay similar.¹ Also other sources confirms the stability of culture, e.g. Guiso *et al.* (2006) that mentions that culture changes only very slowly.

2.3.2 World Value Survey

The World Values Survey (WVS) provides very complex empirical description of basic values and beliefs common for individual nationalities. WVS is a network of social scientists coordinated by the World Values Survey As-

¹This information is based on the direct email correspondence between me and professor Geert Hofstede. "My research was a one-time project, but it has been replicated and extended on other respondent populations several time since see our 2010 book and my scores from around 1970 are still the closest common denominator. National cultures change, but their differences don't; they rarely change places in the rankings upon which my scores are based."

sociation. The WVS Association collected and processed the data from over 100 societies. (World Values Survey Association (www.worldvaluessurvey.org)). There is also European Value Study (EVS) data which is “the most comprehensive research project on human values in Europe” (European Values Study (www.europeanvaluesstudy.eu)). EVS is conducted with similar methodology as WVS. These two data resources could be combined (as used in this thesis or in Bützer *et al.* (2013)). Both WVS and EVS are “large-scale, cross-national longitudinal surveys that are well established in the literature... WVS and EVS cover 96 countries, with at least 1000 respondents in each country.” (Bützer *et al.* (2013), p 14) Some authors take the original WVS data and modified them so they fit the objective of their use. “For each trait included in our analysis, we consider the replies to between one and three relevant survey questions. We aggregate the available annual data to decade-level data (using the average observation in each decade) and thus have three observations per country, for the 1980s, 1990s and 2000s, respectively.” (Bützer *et al.* (2013), p 15)

Trust The most popular variable of recent cultural based economic studies is *Trust*². According to recent papers (Sangnier (2010), Bützer *et al.* (2013)) the positive influence of trust on macroeconomic stability is expected. “Higher trust is associated with lower macroeconomic instability” (Sangnier (2010), p 1) Bützer *et al.* found a “robust empirical evidence for a negative and significant relationship between trust and macroeconomic imbalances” (Bützer *et al.* (2013), p 1). The trust is viewed as the most important proxy for civic capital (Bützer *et al.* (2013), Guiso *et al.* (2010)). Bützer *et al.* point out and test another six variables – cultural traits – that they see potentially important to explain economic imbalances. These are honesty, obedience, confidence in individual self-determination, competition affinity, work ethic, importance attached to thrift. (Bützer *et al.* (2013), p 2) “While trust and honesty are proxies for civic capital, the other traits capture a broader notion of norms and beliefs that we refer to as civic culture.” (Bützer *et al.* (2013), p 6)

²The variable and its construction is further discussed in the Chapter 4

Chapter 3

Macroeconomic Stability in Literature

3.1 Introduction to Macroeconomic Stability

Macroeconomic stability is a state of absence of fluctuations in important macroeconomic parameters. There is a very complex set of factors that influences and shapes the macroeconomic stability. Mainly the influence of economic and political aspects is analyzed, in some literature sources also other aspects are marginally considered. Although the literature acknowledges the complexity of this issue, almost no paper seriously recognizes the complex effect of “nature of the people” – their common cultural characteristics – on macroeconomic stability. There is current research which analyzes the effect of some characteristics ((Sangnier (2010), Bützer *et al.* (2013)), Guiso *et al.* (2010)).

Macroeconomic stability is important to ensure the continuous and sustainable development of economy. Economic stability is necessary condition for economic growth and prosperity. According to European Commission “Economic stability is desirable because it encourages economic growth that brings prosperity and employment, ...” (European Commission (ec.europa.eu)). Stable economic and political conditions with favorable development of main economic parameters are desirable for all investors, traders¹ and firms. When an economic actor can decide between two countries, he usually chooses *ceteris paribus* the one with stable conditions. This is mainly because the most economic actors are risk averse and they prefer stable economy. Stability is seen as an ideal state of economy and state bodies should target it. This is often

¹Of course there are speculators that benefit from instability of certain countries.

included in macroeconomic stability definitions throughout variety of literature sources. European Commission says that “economic stability and low inflation create the necessary conditions for sustainable long-term growth, ...” (European Commission (ec.europa.eu)). According to Business Dictionary “economic stability is usually seen as a desirable state for a developed country that is often encouraged by the policies and actions of its central bank.” (Business Dictionary (www.businessdictionary.com)). The currently widely discussed topic of economic crisis is deeply bounded with economic stability. “It is now commonly acknowledged that financial, fiscal and economic imbalances have contributed to the crisis” (Bützer *et al.* (2013), p 4).

Macroeconomic imbalances that when repeated create macroeconomic instability could be seen as an “inter-temporal collective action problem”. Macroeconomic imbalances are an inter-temporal shift of resources. High public deficit and high inflation are caused by over-consumption in current period. (Bützer *et al.* (2013), p 5) To sum up people of today eat the food for the money which have to be paid by people of tomorrow. Different cultures deal with the inter-temporal collective action problem in a different way. There are cultures that focus more on the sustainability. These societies exhibit common characteristics – e.g. higher interpersonal trust (Guiso *et al.* (2010), Bützer *et al.* (2013)) – which contribute to the future oriented solution of an inter-temporal collective action problem. The higher level of civic capital is more developed (Guiso *et al.* (2010), Bützer *et al.* (2013)). The situation that “higher” social capital could result in better use of resources between time periods is also captured in the Hofstede’s Dimension Long-Term Orientation². Long-term Orientation has also an impact on production. Countries more oriented to the future – which are able to wait for their reward to the future period – have *ceteris paribus* higher GDP growth (Hofstede *et al.* (2010), ?).

Macroeconomic stability shouldn’t be considered as rigidity. For the continuous and harmonic economic development the stable development of the main parameters is necessary. This topic is discussed already in 1950 by Bach (1950) (page 155). There are some economic parameters which shape the macroeconomic stability (such as inflation) for which there is no correct value, but the harmonic development is desirable.

²Discussed in detail in the Chapter 4

3.2 Definition of Macroeconomic Stability

Many researchers differ in their perfect definition of macroeconomic stability. There is no absolute definition. All relevant definitions of macroeconomic (or economic) stability aim to similar meaning but they differ in the description of parameters that are important. All describe the stability as balance or absence of fluctuations, but different recourses emphasize different parameters to be crucial.

The macroeconomic stability is in some sources very generally described as “a mix of external and internal balance” (Ocampo (2005), page 1). In other sources as the absence of fluctuations or state with very low fluctuations. “Economic stability refers to an absence of excessive fluctuations in the macroeconomy” (definitions.net (2014)). Some sources describe the stability as the predictability which is important for long-term planning. “Economic security refers to a situation in which production units can plan long-run projects without having to worry about environmental and social obstacles” (Najarzadeh & Shahri (2008), page 4). The importance of individual elements of the macroeconomic stability depends on sources and the ongoing era. But all economic stability definitions include *price level* stability as the key part. Previously mainly low inflation and *high-level employment* were considered as key parts of economic stability. Early after the World War II. the field of economics considered that the internal balance was represented mainly by “full employment and stable economic growth, accompanied by low inflation” (Ocampo (2005), page 1). In 1950’s the common definition of economic stability was “stable, high-level employment and stable price level”, which according to Bach fails to include the *real output* objective (Bach (1950), page 155).

In recent years there are also several approaches to economic stability definition. The *fiscal balance* and *price stability* are the main factors of internal macroeconomic balance (Ocampo (2005), page 1). Also *economic growth* has been mentioned as the necessary part of the definition. The economy must have fairly constant output growth and consistently low inflation to be considered economically stable (definitions.net (2014), ?). One of the best known economic stability descriptions is included in the Maastricht Criteria (MC, or the Convergence Criteria). MC capture the stability of the economy mainly in the monetary point of view. The Maastricht Criteria were constructed in the year 1991 to decide which countries are ready to join the Euro Zone. The main goal is to ensure the economic convergence of the EU Member States. The Maas-

tricht Criteria captures five macroeconomic areas: *Price stability*, *Sound public finances*, *Sustainable public finances*, *Durability of convergence* and *Exchange rate stability*. (paragraph based on European Commission (ec.europa.eu/)) Bützer et al. considers between the main factors the government budget balance and the inflation rate but also the current account balance (Bützer *et al.* (2013), p 4).

In some literature sources the reversed definition is stated – the macroeconomic instability is described. In these reverse definitions similar factors are stressed to be important. “Large swings in economic activity, high inflation, unsustainable debt levels and volatility in exchange rates and financial markets” (United Nations (2012)). “An economy with frequent large recessions, a pronounced business cycle, very high or variable inflation, or frequent financial crises would be considered economically unstable.” (definitions.net (2014)). The existence of instabilities – such as recessions, crises, cycles and shocks – is stressed. “Economic instability is the result of various and unexpected economic shocks” (Najarzadeh & Shahri (2008), p 4). The factor *inflation* is still the crucial part of such reversed definitions. Besides *level of debt* and *exchange rates* are mentioned. It is necessary to conclude that moderate level of debt and smooth level of exchange rates are very important factors of macroeconomic stability.

Very complex definition of macroeconomic stability is as follows “macroeconomic stability involves multiple dimensions, including not only price stability and sound fiscal policies, but also a well-functioning real economy, sustainable debt ratios, and healthy domestic financial and non-financial private sector balance sheets. A well-functioning real economy requires, in turn, smoother business cycles, moderate long-term interest rates and competitive exchange rates, all of which may be considered intermediate goals of the ultimate Keynesian objective: full employment.” (Ocampo (2005), pp 1-2)

3.3 Macroeconomic Stability Indices in Literature

In the literature several macroeconomic stability, or instability, indices are defined, while different important variables that shape macroeconomic stability are included. “The choice of indicators is debatable and alternative measures could be included in the index” (Bützer *et al.* (2013), p. 13).

Stylized macroeconomic imbalances index (*Imbalances Index*, IMB)³ consisting of the fiscal balance, the current account balance and the inflation rate was constructed by authors Bützer, Jordan and Stracca in 2013 (Equation 3.1). IMB consist of government net lending in percentage of GDP – as *fiscal balance* or *internal balance*, the *inflation rate* (the variable is with the minus sign) and the current account of the balance of payments in percentage of GDP or *external balance*. Each component is “standardized to account for different variances” (Bützer *et al.* (2013), p 12). An increase in the index represents an increase in the imbalances, thus decrease of macroeconomic stability. (Bützer *et al.* (2013), p 12) To increase the robustness of the testing and to avoid potential discussion about the concrete version of the index authors consider five more variations of the original index. First two variations employ the inflation and/or the current account balance in absolute terms instead of standardized variables. In another two variations the current account balance and/or the inflation are completely abandoned. And finally all the components of IMB are squared. “An increase in the index signals an increase in macroeconomic imbalances, by which we mean a higher fiscal deficit, a higher inflation rate, and a higher current account deficit.” (Bützer *et al.* (2013), p 12) The ranking of the countries according to baseline IMB was corresponding to the expected ranking of development of the countries. (Bützer *et al.* (2013), pp 13-14) Bützer *et al.* are not using any weights to individual parameters. They want to avoid arbitrariness. (Bützer *et al.* (2013), p 13).

$$IMB_{it} = -GovLend_{it} + Inf_{it} - CurAcc_{it} \quad (3.1)$$

Another index the Macroeconomic instability index or *Ismihan Index* (ISI) is calculated using four factors that according to the author influences macroeconomic stability the most (Equation 3.2 defined in Ismihan (2003)). These are *inflation rate*, *public deficit to GNP ratio*, *external debt to GNP ratio* and *exchange rate variability*. The final ISI is constructed as the sum of unified⁴ parameters. Higher ISI indicates lower macroeconomic stability.

$$ISI = I_t^{Inf} + I_t^{PubDef} + I_t^{ExtDeb} + I_t^{Exch} \quad (3.2)$$

Another index includes *economic output* as the single important parameter

³In the original source also *sustainability index*.

⁴Further discussion on the ISI definition where also the construction process is described is included in Chapter 4

that shapes macroeconomic stability. The standard deviation of GDP is used as *Economic Instability Index* in the work of Najarzadeh and Shahri. The authors' argument is that "since GDP is a measure of economic activities, it seems appropriate to use the GDP fluctuations to measure instability." According to literature review on macroeconomic stability this index is incomplete as it lacks main parameters that influence stability.

$$VolGDP_t = \frac{\sqrt{VarGDP_t}}{E(GDP_t)} \quad (3.3)$$

As the economic stability of the country crucially influences the foreign investments, another type of stability index is created by the organization Euromoney Institutional Investor and is called *Euromoney's Country Risk rating*. The rating is based on surveys and monitors political and economic stability of 186⁵ countries around the world. The rating of each country is based on the evaluation of experts which have the deep knowledge for the situation in that country. The complex Euromoney Country Risk (ECR) score reflects both qualitative and quantitative variables. "Euromoney assigns a weighting to six categories. The three qualitative expert opinions are political risk (30% weighting), economic performance (30%), and structural assessment (10%). The three quantitative values are debt indicators (10%), credit ratings (10%), access to bank finance/capital markets (10%)." (Euromoney (euromoney.com)) Besides the complex ECR score there are also secondary scores produced. One of which is also an *Economic risk rating*. The individual factors that influences the Economic risk are as follows: bank stability, GNP outlook, unemployment rate, government finances, monetary policy (or currency stability). (Euromoney (euromoney.com))

3.4 Methodology and Data Used in Literature

In some literature sources, in which the cultural topic is studied, the *Vector Autoregression* is used to model panel data. Authors Boubtane et al. research the relationship between immigration and economic growth and unemployment in the host country. They use panel VAR and Impulse Response Functions (IRFs) to show the "interaction between immigration and host country economic conditions" (Ekrame *et al.* (October 2012), Abstract). Using VAR techniques

⁵The number of countries included in the survey is valid at October 2014 (Euromoney (www.euromoney.com))

they tried to solve the endogeneity issue “by allowing the endogenous interaction between variables in the system” (Ekrame *et al.* (October 2012), Abstract) on the data from 22 OECD countries over 22 years. When the coefficients are estimated by panel VAR techniques, they use the impulse response functions and the variance decomposition to analyze the data. (Ekrame *et al.* (October 2012)) The impulse response function captures “the response of an endogenous variable over time to a shock in another variable in the system”. (Ekrame *et al.* (October 2012), page 7) The variance decomposition then evaluates the influence of individual sources of the shock on the variance of endogenous variables. When analyzing of the effect of migration one could observe the immediate shocks, but when analyzing the culture as such these shocks could not be observed. But individual cultures are quite stable, they change slowly and smoothly over time as the external influences are incorporated to them. This is why the impulse response function would not be suitable for the purpose of this thesis.

Some researchers who analyze the effects of some of the cultural characteristics on macroeconomic stability treat the data as cross-sectional and use respective techniques (Sangnier (2010), Bützer *et al.* (2013)). Although the original dataset contains the time variable and the type of the data is panel. Bützer *et al.* use decade-level data starting between 1980 and 2010. The dataset contains data from 65 advanced and emerging economies. The data originated from World Values Survey and the European Values Study. (Bützer *et al.* (2013), p 2, 11) These researchers test the effect of trust on macroeconomic imbalances (Bützer *et al.* (2013)) or volatility (Sangnier (2010)) using treating the data as cross-sectional. “In a cross section of countries, higher trust is correlated with weaker macroeconomic volatility.” (Sangnier (2010), p 2) “We first present crosscorrelations between our cultural traits and their association with the imbalances index. We then focus on trust and estimate its impact on the imbalances index, employing both Ordinary Least Squares (OLS) and Instrumental Variables (IV).” (Bützer *et al.* (2013), p 6) The authors execute two regressions – pooled OLS and random effects (RE), and after considering the standard errors volume and test results they choose the final results from OLS estimates. (Bützer *et al.* (2013), pp 21-22) They constructed the model (equation 3.4) to test whether “trust, and differences in civic capital more generally, have contributed to the build-up of macroeconomic imbalances” (Bützer

et al. (2013), p 21). They also executed the simple bivariate regressions.

$$Imbalance_{it} = \alpha + \beta Trust_{it} + \gamma_t \lambda_t + \delta_\theta \theta_{it} \quad (3.4)$$

where i is the country, t is time (decade), λ captures mere association and θ is a vector of control variables. (Bützer *et al.* (2013), p. 21)

There are some problematic issues in this type of research. The first one is possibility of *endogeneity*. “The biggest challenge in this strand of literature is to isolate the impact of civic capital from those of other factors, notably institutions, and to address the issue of reverse causality. While civic capital likely affects economic outcomes, there could also be a feedback mechanism through which economic outcomes reinforce and shape certain values and preferences.” (Bützer *et al.* (2013), p 6) Authors explain that these problems should appeal in their case as they “look at a relatively short time horizon of three decades and values like interpersonal trust tend to be very slow-moving” (Bützer *et al.* (2013), p 6). Such argumentation is applicable also for the purpose of this thesis. They state that endogeneity issue might in fact be problematic for the research where the dependent variable is economic growth and development. While it can be considered that economic growth shapes the individual norms and preferences, the possible impact on macroeconomic stability is unclear. (Bützer *et al.* (2013), p 6)

Chapter 4

Data and Methodology

4.1 Data

The optimal way to test the effect of culture on macroeconomic stability is to test the complex panel dataset (from many countries during many years). In this work such panel data are tested. There are three sets of data that are used in the regression. First set consists of economic data (from which the response variable is constructed). The second set of data is cultural characteristics (explanatory variables). And the third set includes the the data utilized as control variables. The complete dataset used is included in the enclosed CD.

All the numeric data used in the regression are standardized as the metrics of all numeric variables do not have special explanatory meaning. The standardization is the way to put “all predictors on the common scale” (further discussion in Gelman (2007)). The standardized variables have zero mean and unit variance. The standardized variables’ effect could be interpreted in the following way. The increase of the standardized variable by 1 unit is equivalent to a standard deviation increase in the original unscaled variable. Ceteris paribus the average effect of one standard deviation increase in explanatory variable is associated with the respective coefficient β increase of response variable. (Goldberger *et al.* (1964), Wooldridge (2002))

4.1.1 Countries

My dataset consists of yearly data for the period between 1981 and 2013 for 58 countries. The dataset is unbalanced (maximal $n = 58$ and $t = 33$). No balancing techniques are used as it isn’t necessary. The datasets are large enough for all regressions. The list of all 58 countries is stated in the table 4.1.

There are representatives of all continents¹ – 21 European, 15 Asian, 7 African, 7 South American, 6 North American and 2 Oceanian countries. Within the dataset there are present all types of countries – advanced (e.g. 29 OECD countries), emerging and developing countries (e.g. 5 Sub-Saharan African countries).

Table 4.1: List of Countries

Argentina	Finland	Malaysia	South Africa
Australia	France	Malta	South Korea
Austria	Germany	Mexico	Spain
Bangladesh	Ghana	Morocco	Sweden
Belgium	Greece	Netherlands	Switzerland
Brazil	Guatemala	New Zealand	Thailand
Bulgaria	Hungary	Nigeria	Trinidad and Tobago
Canada	India	Norway	Turkey
Chile	Indonesia	Pakistan	United Kingdom
China	Iran	Peru	United States
Colombia	Ireland	Philippines	Uruguay
Denmark	Israel	Portugal	Venezuela
Egypt	Italy	Romania	Zambia
El Salvador	Japan	Saudi Arabia	
Ethiopia	Luxembourg	Singapore	

4.1.2 Cultural Variables

For the final regression analysis the following cultural variables are used. The variables have been chosen based on the literature review. All used cultural variables are stated in the table 4.2.

Hofstede's Dimensions

In this thesis the following Hofstede's dimensions are utilized – *Power Distance*, *Individualism versus Collectivism*, *Masculinity versus Femininity*, *Uncertainty Avoidance* and *Long-Term Orientation vs. Short-Term Orientation*². The dataset contains the values for the five dimensions for all 58 countries and the values stay constant during the years (further discussion on the development and stability of culture in the Chapter 2). The Hofstede's cultural dimensions

¹Except Antarctica, naturally.

²There is also the sixth dimension *Indulgence Versus Restraint* but it is still in its "infancy" as it hasn't been much tested yet, so it is not utilized within this thesis.

Table 4.2: List of Cultural Variables

Variable	Source of Data
Power Distance	Hofstede's dimension
Individualism versus Collectivism	Hofstede's dimension
Masculinity versus Femininity	Hofstede's dimension
Uncertainty Avoidance	Hofstede's dimension
Long-Term Orientation vs. Short-Term Orientation	Hofstede's dimension
Children Qualities – Hard Work	World Values Survey
Children Qualities – Responsibility	World Values Survey
Importance of Work in Life	World Values Survey
Trust – Most People Could be Trusted	World Values Survey

are freely accessible on the Hofstede's web page (Geert Hofstede et al. (geert-hofstede.com/countries)). In the Appendix A is stated the complete dataset of Hofstede's dimensions which are scored by index values.

Power Distance The first Hofstede's dimension *Power Distance* which captures how people handle the existence of inequalities between their status and status of other people. Power distance can be defined as “the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally.”³ (Hofstede *et al.* (2010), p 61)

The *Power Distance Index* (PDI) ranges from around 0 for small-power-distance countries to around 100⁴ for the large-power-distance countries. In small-power-distance countries there is only small distance between individual power levels (between parents and children, employees and bosses, etc.). The subordinates prefer, and are allowed to, consult their decisions with their bosses. On the contrary in the large-power-distance countries the subordinates either accepts (respectively reject) the decision of the boss rather than consults it with him/her ⁵ (Hofstede *et al.* (2010), pp 55-62) PDI is linked to the country's wealth. Richer countries are usually associated with lower PDI. (Hofstede *et al.* (2010), Hofstede (2001))

³“Institutions are the basic elements of society, such as the family, the school, and the community; organizations are the places where people work.” (Hofstede *et al.* (2010), p 61)

⁴Original range from 0 to 100 has been enlarged as new countries which performed to have even larger score as 100 where added, e.g. Slovakia with 104.

⁵In large PDI countries doctors prescribe more frequently antibiotics as they don't consult their decision with the patients – the lower power level.(Deschepper *et al.* (2008))

Individualism versus Collectivism Second dimension called *Individualism versus Collectivism* describes the fact that there are two main types of people. The first type represents people which do live more close to each other, they exhibit more collectivist behavior, they help and support each other a lot. The second type consists of people which exhibit individualistic behavior and care mainly about themselves (or about very few people to which they are really close).

IDV as the *Individualism Index* reaches the values from around 0 for the most collectivist to around 100 for the most individualistic countries. In the collectivist countries people tend to live in the bigger societies as families with distant relatives, or they spent at least a lot of time with them. A person from such society feels as a part of a cohesive group, the individual takes care about the whole group and the group protects him/her. The society shares the common resources. In individualistic societies people live in nuclear families, they care only about themselves and their needs, or needs of their nuclear family. People from individualistic societies tend to be more honest, they are taught to tell the truth, in contrary collectivist based person usually tries to satisfy others and almost never say “no”. (Hofstede *et al.* (2010), pp 91-92, 106-108) Almost all wealthy countries achieved high score on IDV and nearly all poor countries scored low. (Hofstede *et al.* (2010), pp 89-91,123,132)

Masculinity versus Femininity Dimension number three *Masculinity versus Femininity* depicts that there are societies which exhibit equality of the men and women roles, in these societies people generally care more about families, about environment – these are called femininity societies. “The emotional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life.” On the contrary in masculinity societies people strongly distinguish the emotional gender roles. “Men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life.” (Hofstede *et al.* (2010), pp 139-140)

The *Masculinity Index* (MAS) varies from around 0 for the most feminine societies to around 100 for the most masculine ones.⁶ (Hofstede *et al.* (2010), pp 140-144) The basic ideological differences between the countries on the different part of the list could be summarized in the following way. “People live in order to work” and conflicts are being solved in fights in masculine countries, while in

⁶The most masculine country is Slovakia with MAS=110.

feminine countries “people work in order to live” and in conflicts the negotiation is used⁷. (Hofstede *et al.* (2010), pp 166, 170)

Uncertainty Avoidance The fourth Hofstede’s dimension *Uncertainty Avoidance* captures the fact that some people feel more stressed about unpredictable situations than others. Some people relieve higher stress than others do while dealing with the new ambiguous situation that they haven’t experienced yet. (Hofstede *et al.* (2010), pp 188-191)

The *Uncertainty Avoidance Index* (UAI) score ranges from around 0 for the countries that don’t feel so stressed about uncertainty to around 100 for the most stressed ones. Societies with high UAI usually use more rules and laws that lead and control people’s behavior. In strong uncertainty avoidance countries people tend to be always busy, their life is hurried, while in weak uncertainty avoidance countries people are able to work hard if needed but can relax – people do not have to exhibit constant activity. (Hofstede *et al.* (2010), pp 195, 210)

Long-Term Orientation versus Short-Term Orientation The *Long-Term Orientation versus Short-Term Orientation* is the fifth Hofstede’s cultural dimension. The main idea behind it is that there are some people that think more about the future, they concentrate on the consequences of their actions and they perceive persistence as important. People from long-term (LT) oriented cultures are patient, they are persistent in their goals, they are thrifty. These LT oriented people are able to wait for the wage of today’s work until tomorrow. There are also those short-term (ST) oriented people, which need to have immediate results. These are able to think only about today.⁸ (Hofstede *et al.* (2010), pp 235-239, 242-243)

The *Long-Term Orientation Index* (LTO) has the range between around 0 for ST oriented countries to around 100 for LT oriented ones. LTO has strong relation to the economic growth. While LT oriented poor countries exhibit quite fast economic growth, ST oriented poor countries have slow or even non

⁷There is proved influence of the religion on MAS. “On average, countries with a Catholic tradition tend to maintain more masculine values and those with Protestant traditions more feminine values.” (Hofstede *et al.* (2010), p 176)

⁸The dimension was introduced in Chinese Values Survey and adopted by Hofstede *et al.* The LTO dimension is connected with Confucianism, where the basic values are persistence, thrift, ordering relationships by status and having a sense of shame. (Hofstede *et al.* (2010), pp 237-238)

economic growth. (Hofstede *et al.* (2010); pp 262-275) According to findings of my previous work LTO has positive impact on GDP per capita growth.⁹

World Values Survey

Important source of the regression analysis data is also the *World Values Survey* (WVS). The organization WVS is “a global network of social scientists studying changing values and their impact”. The WVS consists of national surveys which are conducted in almost 100 countries over the world. All the surveys are executed using the same (or with very little changes) questionnaires in different language mutations. Currently the WVS has almost 400 thousands respondents. The WVS data collection have been done six times in history – there have been six WVS waves. The first wave started in the year 1981, the others in 1990, 1995, 1999, 2005, and 2010. The dataset used for the regression analysis was customized so there are no “blank” values for any years. The customization is stated in the table A.2 which is included in the Appendix A. All the WVS data are freely accessible through their web page). (World Values Survey Association (www.worldvaluessurvey.org)).

The WVS is not a complete database, especially for European countries. To complete the dataset the *European Values Study* (EVS) is used as the secondary source. The EVS has been conducted four times – in the year 1981, 1990, 1999 and 2008. The data are accessible through the GESIS web page. (European Values Study (www.europeanvaluesstudy.eu)) The dataset used was also customized and the customization is stated in the table A.3 which is included in the Appendix A.

The WVS (and EVS) data used in the regression are the answers on the questions from the questionnaires. The WVS and the EVS data are constructed in the same way so the dataset can be merged (as it has been conducted in literature – Bützer *et al.* (2013)).

Children Qualities – Hard Work The variable *Children Qualities – Hard Work* is based on the answers on the question “*Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five.*” The possible answers to this question are *Good Manners, Independence, Hard Work, Feeling of Responsibil-*

⁹“From five Hofstede’s cultural dimensions, LTO has the biggest absolute effect on GDP per capita PPP growth. Raise in the long term orientation index of 1 point, increase the GDP per capita PPP growth of about 0,036 pp.” (Šenkýřová (2012), p 48)

ity, Imagination, Tolerance and Respect for Other People, Thrift, Saving Money and Things, Determination Perseverance, Religious Faith, Unselfishness, and Obedience. The variable *Children Qualities – Hard Work* is the percentage number of people who mentioned the answer *Hard Work* as one out of at maximum five possible answers. There are only two possibilities “*Mentioned*” and “*Not mentioned*”.

Children Qualities – Responsibility The variable *Children Qualities – Responsibility* is based on the answers on the same question as the previous variable. The variable is the percentage number of people who mentioned the answer *Responsibility* as one out of at maximum five possible answers.

Importance of Work in Life The variable *Importance of Work in Life* is based on the answers on the question “*For each of the following, indicate how important it is in your life. Would you say it is:...*”. The variable is the percentage number of the respondents that answered “*Very important*”. There are (in most of the waves) these another possible answers “*Rather important*”, “*Not very important*”, “*Not at all important*”, and “*Don’t know*”.

Trust The last but not least WVS and EVS variable used in empirical analysis is *Trust*. It is based on the answers to the question “*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*”. The variable is the percentage of respondents that answered “*Most people can be trusted*”. Other possible answers are “*Need to be very careful*” and “*Don’t know*”¹⁰. This variable is very preciously discussed in the literature (Bützer *et al.* (2013), Sangnier (2010)) where the positive impact of trust on macroeconomic stability is revealed.

4.1.3 Control Variables

Control variables are very important part of the regressions. Control variables should be potentially important variables that influence the dependent variable and ideally do not significantly influence the original results of regression (especially the influence of estimators of dependent variables). Well defined control variables reveal the omitted variable problem. They serve as the main

¹⁰Also the possibility of “*No answer*” is included in the results sheet, but it is usually negligible percentage.

robustness check whether the regression returns correct results. Especially important are control variables in the social studies regressions, where the effect of individual variables is not obvious or predetermined. (Bützer *et al.* (2013), Tabellini (2006)).

The selection of suitable control variables is complicated, there are many parameters that could be possibly important. Based on the literature the following controls are chosen – *Governance Quality*, *Democratic System*, *Education*, *Eurozone Membership*, and *Latin America*.

Governance Quality The *Governance Quality* is employed as one of the control variables. In literature the quality of government and respective institutions is often utilized as an useful control variable. (Bützer *et al.* (2013)) It's effect on macroeconomic parameters has been proved in literature. As the proxy for Governance Quality the index of the most suitable indicators from the Worldwide Governance Indicators (WGI) is constructed. The WGI project “reports aggregate individual governance indicators for 215 economies over the period 1996 - 2013”. The WGI includes six dimensions of governance: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. “These aggregate indicators combine the views of a large number of enterprise, citizen and expert survey respondents in industrial and developing countries.” (Kaufmann *et al.* (2014))

The Governance Quality index used as the control variable Governance Quality is constructed as the simple average of the values (in percentile) of these three indicators: Government Effectiveness, Control of Corruption, and Regulatory Quality. The index could reach the values from 0 to 100. Higher index value is caused by higher values of the indicators. As individual indicators represent the percentile value where 100 is the value of the best country. The higher is the number of the index, the higher is the Governance Quality.¹¹

Democracy Another control variable employed in the regression is *Democratic System*. It is dummy variable. For each country in every year the value is stated. Value 1 represents democratic system, value 0 undemocratic. The variable is based on the data from Freedom House organization which is “an independent watchdog organization dedicated to the expansion of freedom around the world”. The original dataset including the information about democratic

¹¹E.g. the average value of the index of Austria is 95 and of Bangladesh it is only 20.

or undemocratic system in individual countries is freely accessible on their web page. (Freedom House (freedomhouse.org))

Education *Education* is the third control variable included in the model. “Education is one of the most powerful instruments for reducing poverty and inequality and lays a foundation for sustained economic growth” World Bank (data.worldbank.org/topic/education). In the analysis the Education Index produced within the Human Development Reports is used as the proxy for Education. (UN Development Programme (hdr.undp.org/en/content/education-index)) The index reaches the values between 0 and 1. Values close to 1 represents countries (e.g. Norway) with the longest mean value of the school attendance of the population.

Eurozone *Eurozone Membership* is the dummy control variable, where the value is reached by Eurozone members and 0 with nonmembers. The data are real in time, so e.g. Greece acquires both values during years. The variable is chosen as it captures the advanced economies with similar foundations in comparison to the rest of the world. Also Bützer *et al.* (2013) engage the Eurozone Membership as an important variable.

Latin America The last engaged control variable is the dummy variable *Latin American Countries*. The value 1 is gained by Latin American countries, 0 by the others. *Eurozone Membership* and *Latin American Countries* are controls that gather together countries with the same geographic location and similar economic position compared worldwide. The Latin American countries demonstrates higher macroeconomic instability in long-term horizon. (Edwards (2003))

Other Controls Tested There are many possible control variable that have been tested within the model before the final set of variables were chosen. The location of the country on the globe is important to determine the macroeconomic stability. Country’s location plays crucial role on its historical development. Authors Bützer *et al.* are using as one of the control variables Latitude. But from the results of their regression it is obvious that Latitude is not significant. (Bützer *et al.* (2013)) Nevertheless the location specific control dummy variables *Continents* have been tested. There are five continent dummy vari-

ables – Europe, Asia, Africa, North America, South America.¹² Within these continents dummies, there are two which are significant. These are Asia (significance level of 5%) and Europe (1%). These two dummies has an negative impact on baseline Imbalance Index. The interpretation is that countries from continents Europe and Asia has higher stability compared to others. Other dummies continents aren't significant. The continent control variables were not used as the economic reasoning behind is not strong enough, the countries within continents have similar location but could have very heterogeneous economic characteristics.

Another control variables such as Religion, GINI index, Doing Business Index, Population size, OECD membership, and Sub-Saharan African countries have been tested. Non of these control variables had significant impact. These control variables haven't been included not only because of its insignificance but also because of the lack of economic reasoning. Some of the control variables used also don't reach significant influence but the reasoning why they have to be included is clear.

4.1.4 Dependent Variables

Based on the literature review¹³ and on my previous arguments the main economic factors that captures macroeconomic stability are inflation, public debt and external balance. Another very important parameters are unemployment rate and harmonic GDP growth. The main economic factors are included in the baseline index used to model the data. The baseline index the Stylized Macroeconomic Imbalances Index is created by Bützer, Jordan and Stracca (also called *Imbalance index* or *IMB*) in their paper from 2013. Of course one could debate that the choice is not perfect, but it probably never is. Also other authors admits that the choice of the parts of the index could be challenged. Bützer et al. “recognize that the choice of indicators is debatable and that alternative measures could be included in the index” (Bützer *et al.* (2013), page 13). Therefore there are more dependent variables tested in the regression analysis.

To reach the robust results there have been four dependent variables tested. All of the dependent variables are used as the proxy for macroeconomic instability. All the indices are constructed in the way that the higher the index the

¹²The Oceania variable was also produced but not tested as it is the usual procedure with dummy variables that one variable should be omitted.

¹³Further discussed in Chapter 3.

lower is the stability. Within the thesis the common denomination *Macroeconomic Instability Indices* (or *MII's*) is used. To sum up the positive impact of independent variable which raises the MII in fact lowers the macroeconomic stability. There are three secondary indices tested. Two of these are based on IMB but are modified (also called Modified Imbalance indices, mIMB-1 and mIMB-2). The dependent variable mIMB-1 includes also unemployment, the variable mIMB-2 includes unemployment and GDP growth rate. The last but not least index which is tested as dependent variable is created by Ismihan (also called Ismihan Index, or ISI).

Baseline Model Index

The dependent variable tested in the baseline model the Imbalance Index, consisting of the fiscal balance, the current account balance and the inflation rate was constructed by Bützer, Jordan and Stracca.

$$IMB_{it} = -GovLend_{it} + Inf_{it} - CurAcc_{it} \quad (4.1)$$

Where $GovLend_t$ is government net lending in percentage of GDP (*fiscal balance*), Inf_t is the inflation rate (the variable is with the minus sign) and $CurAcc_t$ is the current account of the balance of payments in percentage of GDP. The i stands for each individual country. Each component of the Imbalance index is standardized. An increase in the index represents an increase in the imbalances. (Bützer *et al.* (2013), p. 12)

The countries ranked according to their average values of Imbalance Index are included in the table 4.3. The countries with the lowest imbalances – with highest macroeconomic stability – are ranked in the beginning of the table.

Other Dependent Variables Tested

Modified Imbalance Indices There are two modified imbalance indices engaged in the regression analysis. These secondary dependent variables are regressed to advocate the robustness of the effect of individual explanatory variables on macroeconomic stability. These modified indices incorporates the other two mostly defined macroeconomic stability influencers – unemployment and GDP development.

Table 4.3: Average Values of Imbalance Index

Rank	Country	Index	Rank	Country	Index
1	Saudi Arabia	-5,42	30	Canada	0,24
2	Singapore	-5,14	31	South Africa	0,29
3	Norway	-3,47	32	Uruguay	0,34
4	Trinidad &T.	-3,04	33	Un. Kingdom	0,38
5	Luxembourg	-2,63	34	Ireland	0,45
6	Nigeria	-2,21	35	Mexico	0,47
7	Switzerland	-1,86	36	Israel	0,48
8	South Korea	-1,30	37	Guatemala	0,53
9	Malaysia	-1,20	38	El Salvador	0,57
10	Netherlands	-1,17	39	Italy	0,65
11	Iran	-1,13	40	Pakistan	0,69
12	Finland	-1,07	41	Spain	0,69
13	China	-1,06	42	Ethiopia	0,72
14	Sweden	-0,91	43	Australia	0,81
15	Venezuela	-0,86	44	Zambia	0,81
16	Thailand	-0,80	45	Bulgaria	0,90
17	Denmark	-0,64	46	Malta	1,10
18	Indonesia	-0,63	47	Hungary	1,14
19	Germany	-0,46	48	India	1,17
20	Chile	-0,37	49	Egypt	1,21
21	Philippines	-0,35	50	Turkey	1,34
22	Japan	-0,22	51	Un. States	1,34
23	Austria	-0,17	52	Portugal	1,48
24	Belgium	0,00	53	Romania	1,49
25	Morocco	0,07	54	Ghana	1,54
26	France	0,08	55	Greece	2,08
27	New Zealand	0,12	56	Argentina	2,19
28	Colombia	0,15	57	Peru	3,42
29	Bangladesh	0,18	58	Brazil	3,83

Modified Imbalance Index 1 – Unemployment

$$mIMB_{it}^1 = -GovLend_{it} + Inf_{it} - CurAcc_{it} + Unemp_{it} \quad (4.2)$$

Where $GovLend_t$ is government net lending in percentage of GDP, Inf_t is the inflation rate, $CurAcc_t$ is the current account of the balance of payments in percentage of GDP, $Unemp_t$ is the unemployment rate. The i stands for each individual country. Each component is standardized. An increase in the index represents an increase in the imbalances.

Modified Imbalance Index 2 – Unemployment, GDP growth

$$mIMB_{it}^2 = -GovLend_{it} + Inf_{it} - CurAcc_{it} + Unemp_{it} - GDPg_{it} \quad (4.3)$$

The explanation of the previous index parameters holds, the variable $GDPg_t$ represents the GDP growth.

Ismihan Instability Index The last but not least dependent variable tested is *Ismihan Index* (ISI, originally called Macroeconomic instability index) which is calculated using four factors that according to the author Ismihan influences macroeconomic stability at most: inflation rate, public deficit to GNP ratio, external debt to GNP ratio and exchange rate variability. As these main four factors aren't of the same unit and different ranges Ismihan composes the index using the methodology as is used for calculating the human development index (HDI) by United Nations Development Programme. HDI methodology deals with these issues. (Ismihan (2003), page 214) The index is calculated in two steps. In the first step four values of subindices are gained using the following formula.

$$I_t = (X_t - X_{min}) / (X_{max} - X_{min}) \quad (4.4)$$

Where the X_t refers to the actual value of the factor X (one of four factors: inflation rate, public deficit to GNP ratio, external debt to GNP ratio, and exchange rate variability) in the year t. X_{max} refers to the maximal value and X_{min} to the minimal value of the factor X. All sub-indices I_t are thus ranged between 0 and 1.

In the next step he made the simple average of the four subindices. (Ismihan (2003), pages 214, 215)

Ismihan Index

$$ISI_t = I_t^{Inf} + I_t^{PubDef} + I_t^{ExtDebt} + I_t^{ExR} \quad (4.5)$$

4.2 Metodology

Hypothesis There are three hypothesis tested. These are constructed due to the findings of current literature. There is one most important hypothesis tested in the thesis. (H1) *The macroeconomic stability is influenced by cultural characteristics of countries.* Other hypotheses include the expected individual influence of some dependent variables on macroeconomic stability. (H2) Countries with more long-term oriented inhabitants have higher macroeconomic stability.¹⁴ (H3) Countries where people trust each other more is macroeconomic stability higher.¹⁵

4.2.1 Model

The baseline model where the dependent variable is Imbalance Index (IMB) as macroeconomic instability proxy and the independent variables are cultural characteristics represented by Hofstede's dimensions and WVS variables.

$$IMB = \alpha + \beta_1 PDI + \beta_2 IDV + \beta_3 MAS + \beta_4 UAI + \beta_5 LTO \\ + \beta_6 ChQWork + \beta_7 ChQResp + \beta_8 ImpWork + \beta_9 Trust \quad (4.6)$$

par Where *IMB* refers to Imbalance Index (described in the 4.1.4) and α to a constant. There are five Hofstede's dimensions, where *PDI* is Power Distance Index, *IDV* stands for Individualism Index, *MAS* is Masculinity Index, *UAI* refers to Uncertainty Avoidance Index, and *LTO* for Long-Term Orientation Index. There are four variables based on the data from the World Values Survey, where *ChQWork* stands for Children Qualities – Hard Work, *ChQResp* for Children Qualities – Responsibility, *ImpWork* refers to Importance of Work in Life and *Trust* represents the variable that Most People Could be Trusted.

¹⁴According to findings of Hofstede *et al.* (2010) and others.

¹⁵According to findings of Bützer *et al.* (2013), Sangnier (2010) and others.

The baseline model is also tested after addition of control variables to the model to check the robustness of the influence of the independent variables on the dependent variable. The correct form of the baseline model is included in the next equation.

$$\begin{aligned} IMB = & \alpha + \beta_1 PDI + \beta_2 IDV + \beta_3 MAS + \beta_4 UAI + \beta_5 LTO \\ & + \beta_6 ChQWork + \beta_7 ChQResp + \beta_8 ImpWork + \beta_9 Trust \\ & + \gamma_1 GovQual + \gamma_2 Democr + \gamma_3 Educ + \gamma_4 EuroZ + \gamma_5 LatinAm \end{aligned} \quad (4.7)$$

Where *BI* refers to Imbalance Index (described in the section 4.1.4) and α to a constant. The description of the explanatory variables is identical as for the previous model. The control variable *GovQual* stands for Governance Quality, *Democr* for Democratic System, *Educ* refers to Education Index, *EuroZ* represents Eurozone Membership, and *LatinAm* represents Latin American countries. The control variables are further discussed in the section 4.1.3.

The main explanatory variables which have significant impact on response variable are reproduced in the "narrowed" model. Only the explanatory variables with significant impact are regressed on the same IMB response variable. Also the variant with controls is executed to check the robustness.

There are three other models tested in the the regression. These models check the effect of cultural explanatory variables on macroeconomic stability, as the macroeconomic instability dependent variable is modified. The same methodology used to regress baseline model is applied.

4.2.2 Random Effect GLS with Clustered Errors

Generalized Least Squares As the type of the data tested are panel data the *Generalized Least Squares* (GLS) regression technique is used. The main focus of this thesis is to show the potential influence of cultural traits on macroeconomic stability, not to construct very complicated models, but to clearly show the influence. The GLS is though suitable technique to clearly reveal the influence in the linear regression models. It was firstly introduced by Aitken in 1935. GLS has the same form of the model as classical Ordinary Least Squares (OLS) regression. The common OLS and GLS model form is stated in the

following equation (4.8). The main difference between OLS and GLS is that not all of the OLS assumptions have to be fulfilled. The OLS is a special case of more general GLS. While for GLS the residuals are normally distributed – i.e. $\varepsilon(0, \Omega)$, for OLS residuals have to be normally distributed but also to have constant variance (homogenous variance) $\Omega = \sigma^2 \mathbf{I}$. (Orlaith Burke (2010), pp 10-11)

$$\hat{y} = \mathbf{X}\hat{\beta} + \epsilon \quad (4.8)$$

Where \hat{y} is the column vector of response variables y_i , \mathbf{X} is the matrix of row vectors of explanatory variables $(1 \ x_{1,1} \ x_{2,1} \ \dots \ x_{c,1})$ (c is number of columns), $\hat{\beta}$ is the vector of coefficients β_i , ϵ is the column vector of residuals ϵ_i , $i = 1, \dots, n$.

”GLS is designed to produce an optimal unbiased estimator of β for situations with heterogeneous variance.” (Orlaith Burke (2010), p 10) In GLS regression all of the OLS assumptions¹⁶ have to be fulfilled except for the assumptions of Homoscedasticity. Homoscedasticity is the situation where the residuals have constant variance. When this assumption is not met the Heteroscedasticity is present. The variance of error term is different across observations. (University of Warwick (2014), Orlaith Burke (2010)) In the GLS model heteroscedasticity is allowed and still the best, linear and most efficient estimator is produced. According to definition the GLS estimator is unbiased, consistent, efficient, and asymptotically normal. The GLS technique is also applicable when the certain degree of correlation between the observations in the model is present (Atanlogun *et al.* (2014)). For the panel data, where the dataset consist of data from 58 countries during 33 years, the data within each group – country – are not independent. So the variance of error term might differ across data from each country. The GLS regression analysis is though suitable for the type of the data regressed.

Clustered Standards Errors The data may not be independent within the country so the method of *clustering the standard errors* is used. From the nature of the data (data for individual countries across years) the data within each country may not be independent. The clustering of the standard errors

¹⁶(1) Linearity in parameters; (2) Data are random sample, residuals are uncorrelated; (3) No multicollinearity of independent variables; (4) Expected value of residuals is zero; (5) Residuals are normally distributed; and (6) Residuals have constant variance = Homoscedasticity

is used to solve this issue. While clustering “the standard errors allow for intra-group correlation, relaxing the usual requirement that the observations be independent. That is to say, the observations are independent across groups (clusters – i.e. countries) but not necessarily within groups.” The clustering “affects the standard errors and variance-covariance matrix of the estimators but not the estimated coefficients”. (Stata (stata.com))

Random Effects The model is tested using Random Effect GLS regression technique. The other possibilities of Fixed Effects (FE) and Between Effects (BE) model were rejected as they are not suitable enough. The FE model can not be utilized when there are in time constant explanatory variables, these variables are all Hofstede’s dimensions. The BE technique is not compatible with the clustering of standard errors which is very important to include in the regression. Fixed Effects and Between effects GLS regressions (without clustering of standard errors) were utilized as the robustness check.

Coefficient of Determination In the regression analysis the two out of three possible coefficients of determination R^2 are utilized. According to definition the R^2 is “the proportion of the total sample variation in the dependent variable that is explained by the independent variable in a multiple regression model” (Wooldridge (2002), p 801). There are three types which could be utilized in the GLS regression. These are *within*, *between*, and *overall*. The *within* R^2 is not important for my regression as it captures the explanation of the variance only within each country. Such *within* R^2 is very low as the response variable which is time variant is explained by in time constant (or only very little varying) explanatory variables. The *within* R^2 is done as ordinary R^2 from running OLS on the individual countries data. (Smith (2006))

The *between* R^2 is the most suitable coefficient of determination for type of the data used. It captures the explanatory power of independent variables between the groups – between countries. For the type of the data is the most suitable to test the explanatory power while testing across the countries. For this reason the *between* R^2 is the best coefficient of determination. Also the *overall* R^2 is stated in the results as it captures the overall explanatory power of the model. (Smith (2006))

The effect of nine independent cultural variables on the macroeconomic stability is tested. The three hypotheses are tested employing the GLS regression

analysis with RE and clustered errors using the Data Analysis and Statistical Software Stata.

Chapter 5

Regression Results

Cultural Characteristics Affect Macroeconomic Stability There are some cultural characteristics that significantly affect macroeconomic stability and the results could be taken as robust as the affect is stable through all the regressions. The main hypothesis (H1) that *The macroeconomic stability is influenced by cultural characteristics of countries* can not be rejected. To increase the robustness of the results, I also test the differently specified explanatory variables (all describing macroeconomic stability), use different methods – apply the FE GLS and BE GLS techniques and employ the control variables. All the dependent variables are indices constructed in the way that the higher the index the lower the stability. The positive impact of independent variable which raises the *Macroeconomic Instability Indices* (MII's) in fact lowers the macroeconomic stability (as explained in section 4.1.4). All the regression analysis results are stated in the tables 5.1, 5.2, 5.3.

5.1 Baseline Model

Main Results According to baseline model analysis some of the explanatory variables have significant effect on response variable. There is a significant¹ and robust positive impact on Imbalance Index (which in fact decreases macroeconomic stability) of variables Individualism Index, Uncertainty Avoidance Index, Children Qualities – Hard Work. The variable Trust have positive impact on IMB but the effect is significant only before controls are included. All other explanatory variables Power Distance Index, Masculinity Index, Long-Term Orientation Index, Children Qualities – Responsibility, and Importance of Work

¹On the 10% significance level.

in Life do not have significant impact on IMB. The coefficient of determination of the model is quite large when compared to other cultural economics analyses, it indicated the model fits the real data quite well. The *between* R^2 of the baseline model equals 0,39 for model with no controls and 0,55 for models with controls included. The *overall* R^2 of the baseline model than reaches 0,23 for model with no controls and 0,32 for models with controls included. The baseline model which reveals the effect of 9 cultural variables on IMB with the *overall* R^2 of 0,23 indicating that 23% of the variance of response variable is explained by the variance of independent variables. The coefficient of determination doesn't indicate the perfect fit (which is when $R^2 = 1$), but the proportion of about 1/4 of variance of IMB explained by the model is not negligible. As *between* R^2 captures the explanatory power of independent variables between the groups, almost 40% of the variance is explained by the model.

As all the explanatory variables in the regression analyses are standardized. E.g. IDV in the regression is produced by standardization of original Individualism Index, so although the original IDV ranges from 0 to 100, the standardized IDV has the mean 0 and standard deviation 1.³ The interpretation of the regression results is based on following. The unit increase in the standardized variable is equivalent to a standard deviation increase in the original unscaled variable. Ceteris paribus the average effect of one standard deviation increase in explanatory variable is associated with the respective β coefficient increase of response variable.

Explanatory Variables Effects Description *Individualism Index* has significant positive influence on 10% significance level on IMB, $\beta^{IDV} = 0,67$ with the *P-value* of 0,07. An increase of 1 standard deviation of original IDV (an increase of 1,00 in stadardized IDV) is ceteris paribus (cet. par.) associated with 0,67 increase in IMB. The robustness of the result is checked in the model with controls employed, the effect of IDV is still significant (newly at 1% significance level) and positive, the β^{IDV} almost doubled, so the effect is even higher.

Uncertainty Avoidance Index exhibits significant positive influence on 1% significance level on IMB, $\beta^{UAI} = 1,19$ with the *P-value* of 0,00. An increase of 1 standard deviation of original UAI is cet. par. associated with 1,19 increase in IMB. The robustness of the result is checked in the model with controls

²Types of R^2 further explained in section 4.2.2

³This fact is not repeated each time the variables are discussed.

employed, the effect of IDV is still significant (again at 1% significance level) and positive, β^{UAI} is of about similar value.

Children Qualities – Hard Work has significant positive effect on 5% significance level on IMB, $\beta^{ChQ-W} = 0,55$ with the *P-value* of 0,02. An increase of 1 standard deviation of original ChQ-W is cet. par. associated with 0,55 increase in IMB. The robustness of the result is checked in the model with controls employed, the effect of IDV is still significant (newly at 1% significance level) and positive, β^{ChQ-W} is of about similar value.

Trust has positive influence on IMB, in the baseline model without controls the effect is significant at 1% significance level, $\beta^{Trust} = 0,14$ with the *P-value* of 0,00. An increase of 1 standard deviation of original Trust is cet. par. associated with 0,14 increase in IMB. The robustness of the result is tested within the model with controls employed. The effect of Trust is still positive with higher β^{Trust} , but the results are not significant any more. The *P-value* is 0,21.

Power Distance Index positively influences IMB, $\beta^{PDI} = 0,20$ with the *P-value* of 0,69. Due to the high *P-value* the effect can't be assessed as significant. An increase of 1 standard deviation of original PDI is cet. par. associated with 0,20 increase in IMB. In the model with control variables the results of PDI are similar.

Masculinity Index has positive influence on IMB, $\beta^{MAS} = 0,08$ with the *P-value* of 0,69. Due to the high *P-value* the effect can't be assessed as significant. An increase of 1 standard deviation of original MAS is cet. par. associated with 0,08 increase in IMB. In the model where the control variables are employed, the MAS changes its effect. Newly MAS influences IMB negatively with $\beta^{MAS} = -0,09$ and *P-value* = 0,66, the results are still insignificant.

Long-Term Orientation Index has positive influence on IMB, $\beta^{LTO} = 0,01$ with very high *P-value* of 0,96. Due to the high *P-value* the effect can't be assessed as significant. An increase of 1 standard deviation of original LTO is cet. par. associated with 0,01 increase in IMB. In the model where the control variables are employed, the LTO has still positive impact on IMB, $\beta^{IMB} = 0,37$ and the *P-value* improved, the new level is 0,15. The results are still statistically insignificant.

Children Qualities – Responsibility has as the only explanatory variable⁴ negative effect on IMB, $\beta^{ChQ-R} = -0,92$ with *P-value* of 0,48. Due to quite high *P-value* the effect can't be assessed as significant. An increase of 1 stan-

⁴Except from constant.

dard deviation of original ChQ-R is cet. par. associated with 0,92 decrease in IMB. In the model with control variables the results of ChQ-R are similar.

Importance of Work in Life has positive influence on IMB, $\beta^{Imp-W} = 0,25$ with *P-value* of 0,22. Due to the *P-value* the effect can't be assessed as significant at predetermined 10% (or higher) level of significance. An increase of 1 standard deviation of original Imp-W is cet. par. associated with 0,25 increase in IMB. In the model with control variables the results changes. The new β^{Imp-W} is negative, with value of -0,01, the *P-value* is very high (0,95). The results are still insignificant.

Table 5.1: Baseline Model Results

Dependent Variable] Variable	Model 1		Model 1	
	IMB		IMB	
	Coefficient		Coefficient	
Hof PDI	0,20	(0,51)	0,23	(0,35)
Hof IDV	0,67*	(0,37)	1,38***	(0,35)
Hof MAS	0,08	(0,21)	-0,09	(0,20)
Hof UAI	1,19***	(0,23)	0,82***	(0,20)
Hof LTO	0,01	(0,21)	0,37'	(0,25)
WVS ChQ Hard Work	0,55**	(0,24)	0,65***	(0,25)
WVS ChQ Responsib.	-0,92	(1,29)	-1,23	(1,64)
WVS Important Work	0,25	(0,20)	-0,01	(0,20)
WVS Trust	0,14***	(0,05)	0,71	(0,06)
constant	-0,23	(0,27)	-0,17	(0,24)
Governance Quality			-0,66*	(0,34)
Democracy			0,32**	(0,15)
Education			-0,46'	(0,31)
Eurozone			-0,15	(0,12)
Latin America			0,67*	(0,39)
R-sq between	0,39		0,55	
R-sq overall	0,23		0,32	

a Significance levels: *** 1%, ** 5%, and * 10%

b The symbol ' is only informal and stands for almost significant coefficients with significance level of 15%.

c The number in the brackets () behind the coefficient value is *robust standard error*.

The narrowed regression where only the significant variables from the baseline model regression was executed. The results are introduced in the table 5.2. The

effect of the significant explanatory variables remains positive, the significance levels are met for UAI and ChQ-W. The IDV has the little higher *P-value* (0,15). The results could be evaluated as robust.

Table 5.2: **Significant Variables Regression Results**

Dependent Variable] Variable	Model 1n		Model 1n	
	IMB		IMB	
	Coefficient		Coefficient	
Hof IDV	0,28'	(0,20)	0,90***	(0,27)
Hof UAI	0,93***	(0,20)	0,76***	(0,17)
WVS ChQ Hard Work	0,46**	(0,20)	0,48**	(0,22)
constant	-0,12	(0,20)	-0,01	(0,17)
Governance Quality			-0,64**	(0,27)
Democracy			0,35**	(0,16)
Education			-0,23	(0,27)
Eurozone			-0,08	(0,08)
Latin America			0,37	(0,30)
R-sq between	0,29		0,42	
R-sq overall	0,18		0,26	

a Significance levels: *** 1%, ** 5%, and * 10%

b The symbol ' is only informal and stands for almost significant coefficients with significance level of 15%.

c The number in the brackets () behind the coefficient value is *robust standard error*.

5.2 Extensions and Modifications

As it was introduced, the robustness check is also executed through the analysis of the modified models. The results indicate that positive effect of IDV, UAI and ChQ-W is robust. These variables influences negatively economic stability. The significance of negative influence of Trust on macroeconomic stability raises very interesting challenge for current researchers.

Individualism versus Collectivism The variable *Individualism Index* (IDV) has significant positive impact on Macroeconomic Instability Indices (MII's). More individualistic nations have lower macroeconomic stability. In all models where the response variable is IMB or modified IMB (or "*IMB based*" indices) the IDV has strong positive impact on MII. The coefficient β^{IDV} varies

Table 5.3: Modified IMB and ISI Regression Results

Dependent Variable] Variable	Model 2		Model 3		Model 4	
	mIMB1–Unemp Coefficient		mIMB2–Un,GDP Coefficient		ISI Coefficient	
Hof PDI	0,10	(0,55)	0,12	(0,48)	0,13	(0,21)
Hof IDV	0,83**	(0,41)	1,08***	(0,1)	0,16	(0,20)
Hof MAS	0,16	(0,24)	0,22	(0,23)	0,24*	(0,12)
Hof UAI	1,29***	(0,23)	1,49***	(0,22)	0,22*	(0,13)
Hof LTO	-0,00	(0,23)	-0,05	(0,23)	0,09	(0,15)
WVS ChQ Hard Work	0,58**	(0,23)	0,52**	(0,25)	0,14'	(0,10)
WVS ChQ Responsib.	-0,79	(1,29)	0,46	(1,52)	0,08	(0,47)
WVS Important Work	0,39*	(0,34)		(0,23)	0,07	(0,09)
WVS Trust	0,12**	(0,05)	0,18***	(0,05)	4,21***	(1,59)
constant	-0,28	(0,28)	-0,24	(0,29)	1,73***	(0,28)
R-sq between	0,42		0,49		0,17	
R-sq overall	0,25		0,27		0,11	

a Significance levels: *** 1%, ** 5%, and * 10%

b The symbol ' is only informal and stands for almost significant coefficients with significance level of 15%.

c The number in the brackets () behind the coefficient value is *robust standard error*.

from 0,67 to 1,38, the *P-value* is low with values from 0,00 to 0,07. So in all models with *IMB based dependent variable* the 10% level of significance is met. There is also positive effect of IDV on Ismihan Index (ISI). IDV should be considered as very important variable with significant negative impact on macroeconomic stability.

Uncertainty Avoidance The variable *Uncertainty Avoidance Index* (UAI) has significant positive impact on MII throughout all models' regressions. Higher UAI score which captures the fact that people feel more stressed about uncertainties lowers macroeconomic stability. In all IMB based indices regressions the coefficient β^{UAI} meet the 1% significance level (with *P-value* = 0,00) and the coefficient β^{UAI} takes on the value around 1,00, it varies from 0,82 to 1,49. The robustness of the positive impact of UAI on MII is proved in the ISI regression, where the effect is also positive with the β^{UAI} value of 0,22 meeting the 10% significance level. UAI should be considered as another very important variable with significant negative impact on macroeconomic stability.

Children Qualities – Hard Work The WVS variable *Children Qualities – Hard Work* (ChQ-W) has also significant and positive impact on MII. The fact whether people mention *Hard Work* to be an important quality to learn children at home has significantly negative impact on macroeconomic stability of respective country (the further discussion about the results is in Chapter 4). For all IMB based indices models the coefficient β^{ChQ-W} has almost the same value, it ranges from 0,52 to 0,65, and it meets the 5% significance level. The robustness of the positive impact of ChQ-W on MII is also checked by ISI regression, where the effect is also positive with the β^{ChQ-W} value of 0,14 and the *P-value* equaling 0,13. Although the statistical 10% significance level is not met still the impact of the variable ChQ-W could be evaluated as rather significant. ChQ-W should be considered as another very important variable with negative impact on macroeconomic stability. In countries where high number of respondents mentioned the hard work as one of the qualities that should be learned at home the macroeconomic stability is lower. The explanation might be that mainly in the countries where the most of the people don't have satisfactory living conditions the high percentage of people chooses the quality Hard Work among other qualities, which are Tolerance and Respect, Good Manners, Independence, etc. They know their kids need to work hard to have better living standards. This could be seen when listing the countries according to their average answers on this survey question – mainly the developing or emerging countries reach the highest places in the rank.

Most People Could be Trusted Another variable with important impact on macroeconomic stability is WVS variable *Most People Could be Trusted* (Trust). The variable Trust has a positive impact on MII. Higher trust between people lower the macroeconomic stability. In the models without control variables (IMB based and ISI) the β^{Trust} is significant at 5% level (with *P-value* ranging from 0,00 to 0,011) and reaching positive values between 0,12 and 0,18 for IBM based indices and the value of 4,21 for ISI. In the baseline model regression with the control variables the variable Trust still exhibits positive impact, but the impact is not significant, with $\beta^{Trust} = 0,07$ and *P-value* = 0,21. The hypothesis (H3) that in countries where people trust each other more is macroeconomic stability higher should be rejected. This is on the contrary from the previous studies where the significant positive impact was revealed.

There are also variables which don't have significant influence on macroeconomic stability.

Power Distance Although *Power Distance Index* (PDI) exhibits in all models positive impact on instability indices, β^{PDI} varies from 0,10 to 0,25, the *P-value* is very high (from 0,50 to 0,85), so the significance level is not met. The positive impact of PDI on MII should be interpreted as that in countries where there is only small difference between individual power levels the macroeconomic stability is higher.

Masculinity versus Femininity Generally *Masculinity Index* (MAS) exhibits insignificant impact on macroeconomic stability. In the models where IMB based indices are used as response variable the effect of MAS is insignificant with *P-value* from 0,33 to 0,69, β^{MAS} varies from -0,09 to 0,22. The positive impact of MAS (which is present in the baseline model with no control variables) on indices could be interpreted in the way that in countries where there is strong difference between gender roles, where men are supposed to be assertive and care about work, while women should be modest and take care about family, the macroeconomic stability would be lower. In the model with controls the positive impact changes into negative impact of MAS. In the model with ISI the results are completely different, here the MAS variable is significant at 10% level having positive impact with $\beta^{MAS} = 0,24$. From this we could see that MAS has really insignificant impact and the results should not be taken as robust.

Long-Term Orientation vs. Short-Term Orientation The *Long-Term Orientation Index* (LTO) despite high expectations exhibits mostly insignificant impact on MII's. In all three models with IMB based indices without control variables the *P-value* is very high ranging from 0,83 to almost 1,00 (0,995), with β^{LTO} varying from negative to positive numbers around 0. Also for ISI the impact is insignificant, with *P-value* of 0,52 (β^{LTO} is positive around 0). While employing controls in the baseline model the impact almost meets the significance level with *P-value* of 0,15, then $\beta^{LTO} = 0,37$. Positive impact of LTO on IMB could be interpreted in the way that LT oriented countries has lower macroeconomic stability. Before the regression analysis was run I had expected significant positive impact of long-term orientation on macroeconomic stability, the expectations are captured in the Hypothesis 2. It is because the

common opinion is that the “troubles” with the stability and economic situation of Greece and Spain might be caused by the fact that these nations aren’t so precise about future planning as some others are (e.g. as Norway). But the real effect of the LTO is proved to be insignificant (further discussion included in the 6) and (H2) is rejected.

Children Qualities – Responsibility The WVS variable *Children Qualities – Responsibility* (ChQ-R) has not significant impact on macroeconomic stability. In all regressions the *P-value* is high, ranging from 0,45 to 0,87. The β^{ChQ-R} varies from negative to positive impact. The positive impact could be interpreted as that with countries where the *responsibility* is mentioned, the stability is lower. The fact whether people mention *Responsibility* to be an important quality to learn children at home has not significant impact on macroeconomic stability of respective country.

Importance of Work in Life The WVS variable *Importance of Work in Life* (Imp-W) has not robustly significant influence on macroeconomic stability. The effect of Imp-W is mostly positive, with β^{Imp-W} ranging from 0,07 to 0,39 with respective *P-value* ranging from significant level of 0,07 to insignificant level of 0,41. The worst econometric results are present in the model with baseline index with controls employed. There β^{Imp-W} is negative with value of -0,01 and *P-value* is very high (0,95). The positive impact could be interpreted as that with countries where the *Work* is viewed as very important, the stability is lower. But as the results of Imp-W are not robust enough, no correct conclusion could be done.

Controls The effect of control variables was mainly as expected. Higher Governance Quality improves macroeconomic stability. More years of Education also influences stability positively. Eurozone countries exhibit higher stability and Latin American countries lower. The only strange control variable result is that the democratic system in country is significantly associated with lower stability. This could be caused by the choice-based sampling problem.

All the necessary tests were conducted. According to ShapiroWilk test the null hypothesis of normality should be rejected. According to the plot of the data this might be due to outliers. The no autocorrelation hypothesis should be rejected. When the correlation matrix is viewed, strong correlation between

PDI and IDV is revealed. When PDI and IDV respectively is dropped from the model the results remains. Although there is some autocorrelation the results are robust. The data don't accomplish all necessary tests, therefore another robustness check was employed. The Fixed Effects and Between Effects GLS regressions were utilized to check the robustness of the results. These regression techniques bring very similar results as GLS RE.

5.2.1 Endogeneity

When testing the influence of cultural parameters on macroeconomic stability the possible existence of inverted causality is very important issue and it shouldn't be neglected. According to Wooldridge (2002) endogeneity is the presence of an endogenous explanatory variable – “an explanatory variable in a multiple regression model that is correlated with the error term, either because of an omitted variable, measurement error, or simultaneity” (Wooldridge (2002), p 794). In the case of this thesis the sufficient attention is paid to endogeneity. As endogeneity might be caused by the loop of mutual causalities between independent and dependent variable, where not only dependent variable is determined by independent variable but also vice versa.

As the dependent variable (*Imbalance Index*, *modified Imbalance Index* and *Ismihan Index*) is time variant but the explanatory variables are stable in time (either fully constant – Hofstede's dimensions, or changing in time longer periods – VWS and EVS) the endogeneity should not exhibit.

Bützer et al. also discuss the question of endogeneity. Authors address the issue by utilizing the instrumental variables. They state that finding the perfect instrumental variable (IV) in reality when researching effect of trust on macroeconomic imbalances is impossible. (Bützer *et al.* (2013), pp 20-21) Also Bützer et al. discuss the possibility of utilizing lagged variables of their explanatory variable trust as an instrument. They argument that trust is persistent over time and so the lagged trust should be strong instrument. (Bützer *et al.* (2013), pp 20-21)

The models where the explanatory variables are time invariant and response variable varies over time, the problem of endogeneity could be neglected. The reversed effect of macroeconomic stability on already defined parameters could not erase.

Chapter 6

Conclusion

The influence of culture on macroeconomic stability should not be overlooked. The effect of complex cultural traits of individual countries on macroeconomic stability were investigated in this thesis. So far, only individual characteristics – mainly trust – had been researched in the literature. In cultural economics field when the effect of culture on economic variables had been tested, the dependent variable were usually either production or economic development. The main importance of this work is triple. Firstly the effect of the country's *complex set of cultural characteristics* was tested. Secondly the *macroeconomic stability* was analyzed as the dependent variable. Finally until yet the authors of the studies that tested the effect of trust on macroeconomic stability averaged the data through time periods and treated the data as cross-sectional while in this thesis the *panel data analysis was done* and which brought new results.

In the literature the description of the culture mostly includes the common values, preferences and beliefs, that are transferred within generations. Although the culture specific practices are slowly and continuously developing over time, the core cultural characteristics represented by values are stable. There are two most complex databases that comprise the cultural specifications and are most widely used in the literature resources. These are Hofstede's Cultural Dimensions and World Values Survey (WVS) characteristics. These datasets are engaged in the empirical analysis.

In the empirical analysis the significant impact of culture on macroeconomic stability is revealed. Main hypothesis of this thesis that cultural characteristics affect macroeconomic stability has been supported by the regression results. There are several variables that showed significant impact. The Hofstede's Individualism Index which captures individualistic characteristic of the country

has significant negative influence on macroeconomic stability. Also the Hofstede's Uncertainty Avoidance Index exhibits significant negative influence on stability. Within WVS variables the most significant effect was revealed for the variable Children Qualities – Hard Work. In countries where high number of respondents mentioned the hard work as one of the qualities that should be learned at home the macroeconomic stability is lower. The explanation might be that mainly in countries where the most of the people do not have satisfactory living conditions the high percentage of them chooses the quality *Hard Work* among other qualities. On the contrary from the previous studies, the expected positive effect of another WVS characteristic Trust on macroeconomic stability was not supported by regression. The effect was either negative or insignificant.

Empirical analysis revealed new relationships that should be further investigated. The role of cultural economics within the traditional economic fields is still minor. But current papers could be used as arguments to change this. Higher individualistic tendencies of inhabitants have significant negative impact on macroeconomic stability. Individualism probably influences many others economic parameters whose sources are still vaguely described. In countries where people feel stronger fear about uncertainty the macroeconomic stability is also weaker. The fear of uncertainty and new ambiguous situations ties the hands of economic actors. The uncertainty avoidance is probably closely connected to risk averseness of actors. Economist traditionally expect risk averse behavior to be reasonable, but is it really so? The results indicates that too strong fear of new – instable – situation brings even lesser stability. The negative influence of trust on macroeconomic stability brings new challenges for current researchers. The impact of inclusion of other cultural characteristics overturns recent results. This issue also deserves further investigation.

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Appendix A

Important Data

The Appendix A contains the data that complete the thesis. The whole dataset of Hofstede's cultural dimensions is included in the table A.1.

Table A.1: Hofstede's Dimensions

Country	PDI	IDV	MAS	UAI	LTO
Argentina	49	46	56	86	20
Australia	38	90	61	51	21
Austria	11	55	79	70	60
Bangladesh	80	20	55	60	47
Belgium	65	75	54	94	82
Brazil	69	38	49	76	44
Bulgaria	70	30	40	85	69
Canada	39	80	52	48	23
Chile	63	23	28	86	31
China	80	20	66	30	87
Colombia	67	13	64	80	13
Denmark	18	74	16	23	35
Egypt	70	25	45	80	7
El Salvador	66	19	40	94	20
Ethiopia	70	20	65	55	25
Finland	33	63	26	59	38
France	68	71	43	86	63
Germany	35	67	66	65	83
Ghana	80	15	40	65	16
Greece	60	35	57	112	45
Guatemala	95	6	37	101	19

Hungary	46	80	88	82	58
India	77	48	56	40	51
Indonesia	78	14	46	48	62
Iran	58	41	43	59	14
Ireland	28	70	68	35	24
Israel	13	54	47	81	38
Italy	50	76	70	75	61
Japan	54	46	95	92	88
Luxembourg	40	60	50	70	64
Malaysia	104	26	50	36	41
Malta	56	59	47	96	47
Mexico	81	30	69	82	24
Morocco	70	46	53	68	14
Netherlands	38	80	14	53	67
New Zealand	22	79	58	49	33
Nigeria	80	30	60	55	16
Norway	31	69	8	50	35
Pakistan	55	14	50	70	50
Peru	64	16	42	87	25
Philippines	94	32	64	44	27
Portugal	63	27	31	104	28
Romania	90	30	42	90	52
Saudi Arabia	95	25	60	80	36
Singapore	74	20	48	8	72
South Africa	49	65	63	49	34
South Korea	60	18	39	85	100
Spain	57	51	42	86	48
Sweden	31	71	5	29	53
Switzerland	34	68	70	58	40
Thailand	64	20	34	64	32
Trinidad and Tobago	47	16	58	55	13
Turkey	66	37	45	85	46
United Kingdom	35	89	66	35	51
United States	40	91	62	46	26
Uruguay	61	36	38	100	26
Venezuela	81	12	73	76	16
Zambia	60	35	40	50	25

In the following tables A.2, A.3 the years when the WVS and EVS were conducted are stated. The WVS and EVS dataset used for the regression analysis was customized so there are no “blank” values for any years. The customization is stated in the following tables.

Table A.2: **WVS Waves in Years**

Wave Number	Years of Collection	Corresponding Years in Model
Wave 1	1981-1984	1981-1989
Wave 2	1990-1994	1990-1994
Wave 3	1995-1998	1995-1998
Wave 4	1999-2004	1999-2004
Wave 5	2005-2009	2005-2009
Wave 6	2010-2014	2010-2013

Source: World Values Survey Association (worldvaluessurvey.org)

Table A.3: **EVS Surveys in Years**

Survey	Year of Collection	Corresponding Years in Model
Survey 1	1981	1981-1989
Survey 2	1990	1990-1998
Survey 3	1999	1999-2007
Survey 4	2008	2008-2013

Source: World Values Survey Association (worldvaluessurvey.org)

Appendix B

Content of Enclosed CD

There is a CD enclosed to this thesis which contains following folders:

- Folder 1: The electronic version of the thesis (in pdf format)
- Folder 2: The dataset used (in xls)
- Folder 3: The Stata code.