Trust in National Governments in CESEE Countries: Does Income Distribution Have an Impact?

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May 22, 2017

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Abstract

Using data from the OeNB Euro Survey, this paper sheds light on the determinants of trust in national governments in ten Central, Eastern and Southeastern Europe (CESEE) countries in the period 2009-2015. On the base of a unique data set that allows us to construct a measure of income inequality at the regional level, this study is one of the first to focus on the impact of regional income inequality on trust in governments for most of the countries in our sample. By applying multilevel modeling to account for the hierarchical structure of the data, our main findings indicate that while trust in national institutions increases with relative income, it overall declines with the increase of regional and country inequality. This result is valid across different specifications tested and despite the slight decrease of income inequality over the period as shown by the regional Gini index. In addition, our analysis shows that institutional trust in the sample of CESEE countries tends to be lower in EU member states, while perceived corruption is a key factor of distrust.

Keywords: Institutional trust, Income inequality, CESEE countries, Multilevel models

JEL CLASSIFICATION SYSTEM: D1, D63, E24, H21, P23

*We would like to thank Elisabeth Beckmann, Helmut Stix, Nicolas Albacete, Peter Lindner, Julia Wörz, Aleksandra Riedl, Pirmin Fessler, Helene Schuberth (all Oesterreichische Nationalbank) and participants at the WinE Workshop in Geneva in August 2016, the FIW Seminar in International Economics in December 2016 and ECB Research Seminar in April for their comments on earlier drafts of the paper. We are most grateful Sabine Schöffmann and Philipp Poyntner for excellent research assistance. The views expressed are strictly those of the authors and do in no way commit the Oesterreichische Nationalbank (OeNB) or the Eurosystem. All remaining errors are ours.

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1 Introduction

Arrow (1972) famously argued that "[v]irtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence (...)." (p. 357). Economic policy, such as the implementation of structural or tax reforms, crucially depends on the compliance and cooperation of the general public.[1] From a politico-economic perspective, trust is a major determinant of the legitimacy of a political system as a whole or of institutions of particular importance and, in addition, guarantees a stable and democratic environment, which in turn, should favor economic development. Lower trust is, for instance, associated with people expecting more corruption and regulation compared to high-trust environments (Aghion et al. 2010), and, in addition, higher trust enhances financial development (Guiso et al. 2004, 2008). From a macroeconomic perspective, higher levels of trust have been shown to reduce macroeconomic imbalances (Buetzer et al. 2013), reduce macroeconomic volatility (Sangnier 2013), or promote international trade (Guiso et al. 2009), whereas other studies emphasize the positive effect of trust on economic growth (e.g. Knack and Keefer 1997; Zak and Knack 2001; Algan and Cahuc 2010; Horvath 2013).[2]. In short, trust matters for the macroeconomy.

Furthermore, trust is an important determinant of social capital, which Putnam (1999) defines as "features of social life, networks, norms, trust that enable participants to act together more effectively to pursue shared objectives."[3] Social capital enhances growth through its impact on the functioning of public institutions and through alleviating the negative impact of market imperfections and facilitating economic transactions, particularly in financial markets (Alesina and Ferrara 2002). In the literature, social capital is also seen as an important determinant of trust in national institutions. If individuals do not trust each other, they are less likely to trust institutions such as national governments. Hence, there is a pressing need to understand the determinants of trust in governments

[1] Taking a broader perspective, the OECD states that institutional trust (e.g. in national governments) is highly relevant for economic policy, for a sufficient degree of confidence of investors and consumers as well as for the smooth working of finance, which is a key economic activity (URL: http://www.oecd.org/governance/trust-in-government.htm, dl. 30.6.2016.)

[2] For a survey of the effect of trust on various economic outcomes see also Algan and Cahuc 2010

[3] For more details on the economic value of social capital and trust see Putnam (1993), Helliwell and Putnam (1995) or Knack and Keefer (1997).

given its importance for the impact on economic policies and economic outcomes. The question on the driving forces of institutional trust is in particular of a key importance for the countries in Central and Eastern Europe due to the overall lower and even declining levels of trust in national governments since the outbreak of the 2008/09 crisis [4].

In this paper we turn attention to regional income inequality as a determinant of trust. In fact, income inequality may harm trust in institutions through various channels, e.g. the rent seeking behavior of elites and distributive conflict (Engerman and Sokoloff 2002; Acemoglu et al. 2001), a persistent decline in empathy towards other income classes (Wilkinson and Pickett 2009), lower quality of regulatory institutions and property rights (Glaeser et al. 2003, Sonin 2003) or through lower quality of the education system (Bourguignon and Verdier 2000). Thereby, accounting for the regional level of income inequality gives insight into the degree of social cohesion in a country and is thus key for shaping for regional redistribution policies.

We therefore investigate the effect of income inequality (i.e as measured by the regional Gini coefficient) on trust in national governments for ten CESEE countries, controlling for standard explanatory variables at three different levels (e.g. macroeconomic factors, individual characteristics and sentiments regarding both the past and the future) and thus employ a multilevel regression model. Our main findings show that while individual trust in institutions increases with the individual's position at the regional income distribution, it declines with increasing regional income inequality. This result holds even when macroeconomic control variables are included or alternative measures of inequality are used. In addition, we found that respondents denying to report their income, perhaps because they represent the very top of the distribution, also trust more in national governments. Furthermore, we found that the youngest, the oldest and the better educated are more likely to trust national governments. Perhaps less surprisingly, a more optimistic outlook as well as less widespread corruption (either for the country as a whole or for the individual household) is positively correlated with trust in national governments.

The remainder of the paper is structured as follows. Section 2 reviews the relevant literature on inequality and trust. Section 3 presents descriptive evidence on income inequality and institutional trust in the countries and the period of interest. Section 4

[4]According to data from the latest Eurobarometer on average 39% of all respondents in the EU-15 countries tend to trust their national governments, while for the EU CESEE countries, this share amounts on average to only 27% (Eurobarometer, 2016)

explains the data set as well as the econometric methods employed. Section 5 presents the results of our estimations including also marginal effects and Section 6 shows some robustness checks. Section 7 concludes.

2 Literature review - Determinants of trust

From a theoretical perspective, trust is determined by various factors, which cannot be rooted in one single theory. Alesina and Ferrara (2002), for instance, describe two general types of variables correlated with trust. First, these are characteristics of the individual such as age, education, race, gender or religious beliefs. Second, the features of the community in which the individual lives such as the legal institutions tend to be key. Trust may also be influenced through past experience of the individual or the community as individuals and communities with negative past experiences may trust less. Furthermore, Alesina and Ferrara (2002) also describe various channels through which these variables may affect trust. For instance, trust in others (social trust) may be a moral or cultural issue. In this case, trust should be influenced by individual characteristics such as education or religious beliefs of the individual. Another well established aspect is that people tend to trust those who resemble themselves such as family members or members of the same social, racial or ethnic group. Perhaps most important for our purposes, and as Alesina and Ferrara (2002) point out, income disparities may determine how much people trust others.

The majority of recent empirical studies on the determinants of trust has focused on survey data for developed countries, thus a more systematic documentation of the determinants of trust in varying institutional and demographic contexts is still limited. Although research increasingly focuses on some major emerging economies (e.g. OECD 2011, Asadullah 2016), only a few studies have examined the countries of the CESEE-region. For instance, using data from the European Values Survey, Fidrmuc and Gerxhani 2008 confirms that in less developed non-EU neighboring countries (including EU potential candidate countries) institutional trust and social norms appear to be stronger than in the EU New member states, but lower than in the Euro Area countries. In addition, the paper finds that most influential factors of social capital appear to be education and satisfaction with democracy, while age, income, and children are positively correlated with trust. Going further, Bertea and Mihei (2014) explored the link between interpersonal trust and institutional trust for five CESEE countries and generally confirmed their close

inter-linkage.

Catterberg and Moreno (2006) emphasize the role of individual well-being and income as a determinant of political trust, which they define as the confidence of individuals in political institutions (e.g. national parliament or civil service) for a set of 26 developing and advanced countries between 1981 and 2001. Additionally, the authors document a well-established divide between developing and advanced nations with respect to long-term trends of trust or confidence. Political trust declined in all subsets of countries, but the decline was more pronounced in developing nations, which is consistent with our previous observation that trust levels differ between EU- and non-EU-countries.[5]. They find that individual well-being and income are positively linked to political trust whereas, not surprisingly, political radicalism or corruption permissiveness have a negative effect on political trust. Using household data from the OeNB Euro Survey, Beckmann et al. 2013 is the only study so far to have descriptively analyzed institutional trust, however turning attention on the EU institutions. They find that while trust in the EU declined significantly in the CESEE EU Member states during the sovereign debt crisis, an increase was found for the most of the non-EU countries contributing this to major EU integration steps in the latter group of countries.

In a recent paper, closely related to ours, Knell and Stix (2016) show that socio-demographic characteristics along with perceived income inequality are key determinants of social trust in Austrian regions. The authors develop a theoretical framework, defining reference groups, to study the links between trust, trustworthiness and inequality and model trust as expected trustworthiness which in turn depends on expected relative income differences. The authors show that not accounting for this heterogeneity of reference groups, especially in studies with a small degree of variation of countries, would underestimate (or even fail to detect) a significant effect of the Gini coefficient at all. In order to account for this, the authors use an individual-specific measure of perceived inequality and conclude that this measure shows the expected negative and significant influence on trust. Once these corrections are introduced into the model specifications, income inequality becomes a significant determinant of trust.

The link between trust and income inequality in the CESEE countries has remained so

[5]According to the study, political trust declined on average by 29 percentage points in former Soviet Republics, by 13 percentage points in Eastern Europa but only by 4 percentage points in "established democracies", all of which are advanced countries

far largely under-explored. Anderson and Singer (2008) confirm the negative link between income inequality and trust in public institutions. They use multilevel modeling to assess the impact of income inequality, measured by the Gini-coefficient based on data from the Luxembourg Income Study (LIS) for a set of 20 countries (although only four CESEE countries are included in the sample: the Czech Republic, Hungary, Poland and Slovenia). Interestingly, they also find a different manifestation of the negative effect, depending on the political ideology of the individual. In short, people on the left tend to react with a steeper decline in trust in public institutions to a rise in income inequality, whereas people on the right show a muted negative impact on trust in public institutions, which renders this study a particularly interesting contribution to the literature on micro-behavior and macro-context.More recently, Medve-Bálint and Boda (2014) with a study on the links between institutional trust and income inequality for 23 countries (14 Western European and 9 Eastern European countries). The authors conclude that, firstly, there is a divide in Europe with respect to the effect of income inequality on institutional trust, which means that income inequality negatively affects institutional trust in CESEE-countries whereas the opposite is true for Western European countries. Secondly, they also found that relative income (the position of individuals in the income distribution relative to others) and the individual assessment of the financial situation are positively related to trust in institutions. Thirdly, the authors confirm the negative link between income inequality and trust in institutions for all but four countries in the CESEE region, namely the Czech Republic, Hungary, Slovakia and Slovenia).

To put it in a nutshell, our paper adds to the literature in the following ways. First, we contribute to the scarce empirical evidence on the inequality-trust nexus in ten CESEE-countries. We base our results on regional Gini-coefficients for the ten countries of the CESEE-region of our sample (both EU- and non-EU-member countries) due to its relevance for the degree of social cohesion in a country. Second, we exploit the unique and comprehensive data set by estimating the impact of income inequality on institutional trust and employing a multilevel modeling approach, which accounts for the nested nature of the data and effectively accounting for individual, regional and country-level effects.

3 Some stylized facts on trust and income inequality

As hinted by descriptive results by the Eurobarometer (2016), trust in national governments is generally lower in the CESEE countries than in the EU-15 countries. Accordingly, descriptive evidence from the OeNB Euro Survey including a slightly different sample of CESEE countries shows that the share of respondents trusting their national government varies to a significant extent (Figure 1). For instance, the share of respondents (somewhat) trusting the government in 2009 was particularly high in Macedonia and the Czech Republic. By contrast, Hungary, Croatia, Poland, Romania and Serbia experienced a significantly lower share of trust in national governments in 2009. Interestingly, the picture changes by taking a snapshot view of 2015. The share of people trusting their government increased strongly in Hungary, Poland, Serbia and to some extent in Croatia.[6] Trust increased in Bulgaria, Croatia, Poland, Romania (modestly), Serbia and Hungary (strongly), whereas the share of the population trusting the national government decreased in Albania (modestly), Bosnia and Herzegovina, Macedonia and the Czech Republic. Despite this overall change of trust between 2009 and 2015, there are some interesting country-specific patterns for the surveys conducted in the years in between. Clearly, most of the decline of trust in national governments following 2009 may be related to adverse macroeconomic and financial developments throughout Europe. A snapshot view of 2015 shows that the share of respondents trusting national governments compared to other CESEE-countries was considerably higher in Serbia (42.4%), Poland (40.9%) and Hungary (38%), whereas it is particularly low in Bosnia and Herzegovina (17.4%), the Czech Republic (23.7%) and Romania (24.4%). The average annual change of trust in national governments between 2009 and 2015 was particularly pronounced in Hungary, Serbia and Poland, where levels of trust increased significantly. On the contrary, a decrease of trust occurred in the Czech Republic, Macedonia and Bosnia and Herzegovina, whereas the average change in Albania and Romania is virtually nil.

Turning to the development of income inequality, most CESEE-countries experienced a decline (measured by the Gini-coefficient) between 2009 and 2015 at the country-level

[6] Election cycles may have a significant influence on the share of people expressing trust in governments. Hungary may constitute such an example, where Viktor Orbán was elected in a landslide victory. Hence, trust in the national government in Hungary may be causally related to large swings in government composition, despite the increase in regional income inequality in Hungary. We control for the influence of election cycles, see Section 5.

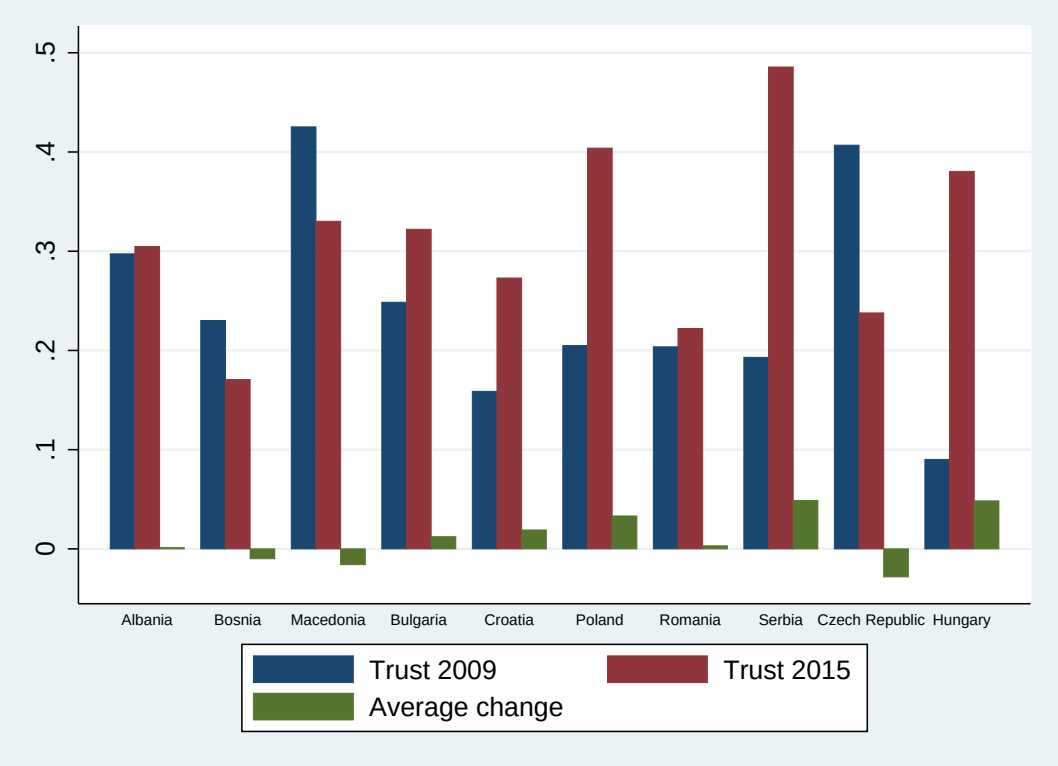

Figure 1: Trust in national governments, 2009 vs 2015 and average annual change. Source: OeNB Euro Survey, own calculations.

which is one distinguishing feature from industrialized countries' experience since the crisis (see OECD 2015).[7] Figure 3 shows that income inequality declined in Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Romania, Serbia and Hungary. At the same time, income inequality increased in Macedonia and was essentially flat in the Czech Republic

[7]We are aware of the shortcomings of an aggregate measure of income inequality such as the Gini-coefficient. For one thing, different distributions of income among households or individuals may yield the same value of the Gini-coefficient (the Lorenz curves intersect), which makes it impossible to make any normative assertions as to whether one distribution is preferable to the other. Atkinson famously argued that "(...) the degree of inequality cannot, in general, be measured without introducing social judgments." (Atkinson 1975, p. 47). The Gini-coefficient is particularly sensitive to changes in the middle of the income distribution compared to its tails, which is a normative assertion by definition. In the context of this paper, however, this shortcoming is to our benefit given that we have relatively few observations at the very top (due to high rate of individuals either understating or not reporting their income at all and the lack of oversampling of the top income households in the survey itself), which may result in biased top income shares or ratios between the top and bottom or middle of the distribution.

and Poland. This finding is broadly in line with other studies, which confirm the decrease in income inequality in CESEE-countries since 2009 using different data (Koczan 2016). However, in their study the CESEE region is split into three subcategories, Central and Eastern Europe, South Eastern Europe and the Western Balkans. Income inequality increased in the latter region since 2009, whereas it decreased in the two former regions.

At the regional level, however, we find a somewhat more diverse picture of income inequality as Figure 2 reveals. Macedonia, for instance, experienced a country-wide increase of income inequality between 2009 and 2015, whereas regional income inequality decreased in two out of three regions. In other countries (e.g. Czech Republic), the decrease in one region, here Prague and the surrounding regions, over-compensate the rise in income inequality in almost all other regions such that inequality at the country-level does not appear to change at all. The largest increase in income inequality throughout all regions occurred in Swietokrzyskie (Poland), where the regional Gini-coefficient increased by a whopping 78 percent between 2009 and 2015, followed by two other regions in Poland (Opolskie 52.9 percent and Lubusz 39.1 percent for the same time period). The regions with the largest decline in income inequality were Posznan (Poland) where the regional Gini declined by 42.7 percent, West Herzegovina Canton and Zenica-Doboj Canton (both Bosnia and Herzegovina, -35.8 percent and -35.4 percent respectively). Additionally, income inequality on the country level in Croatia was essentially flat between 2009 and 2015, whereas some regions experienced significant increases of income inequality (Istra and Pomorje +27.5 percent; Dalmatia +20.4 percent). To sum up, regional income inequality changes the perception of income inequality quite significantly for the countries of our sample. Overall, however, the Gini-coefficient shows a remarkable decline of inequality in all but three countries and throughout most of the regions.

Figure 4 shows the levels of trust in national governments for all regions in each country compared to the Gini-coefficient for all years. Given the insights from theoretical and empirical studies discussed before, we would expect a relatively clear negative relationship between income inequality and trust in national governments. This expected negative relationship materializes in a number of countries, for instance in Macedonia, Bulgaria, Poland, Czech Republic, Hungary and, to a lesser extent in Romania. In Bosnia and Herzegovina and the Czech Republic, however, inequality and trust in national governments are positively correlated. There is little correlation in Croatia (slightly positive if anything) and Romania (slightly negative).

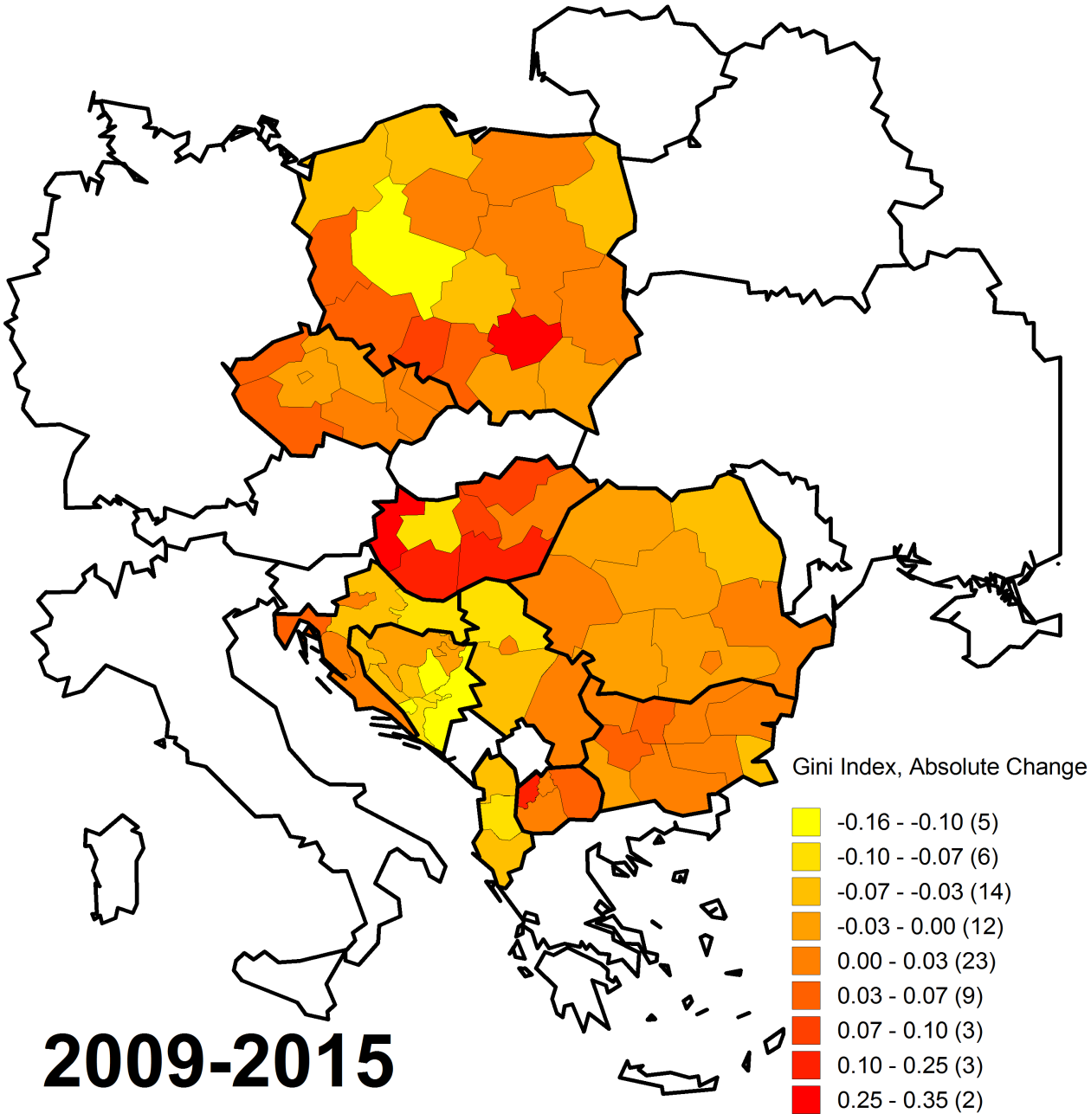

Figure 2: Absolute change of Gini-index in CESEE-countries between 2009 and 2015.
Source: OeNB Euro Survey, own calculations.

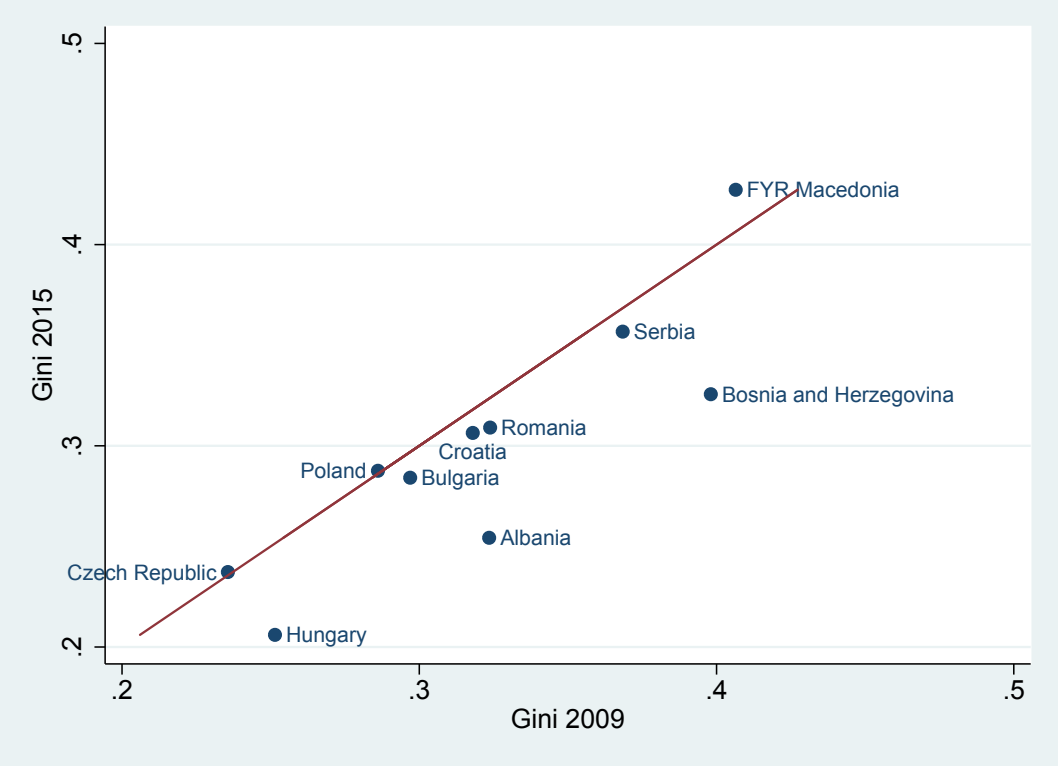

Figure 3: Country-level change of Gini-coefficient 2009 to 2015.
Source: OeNB Euro Survey, own calculations.

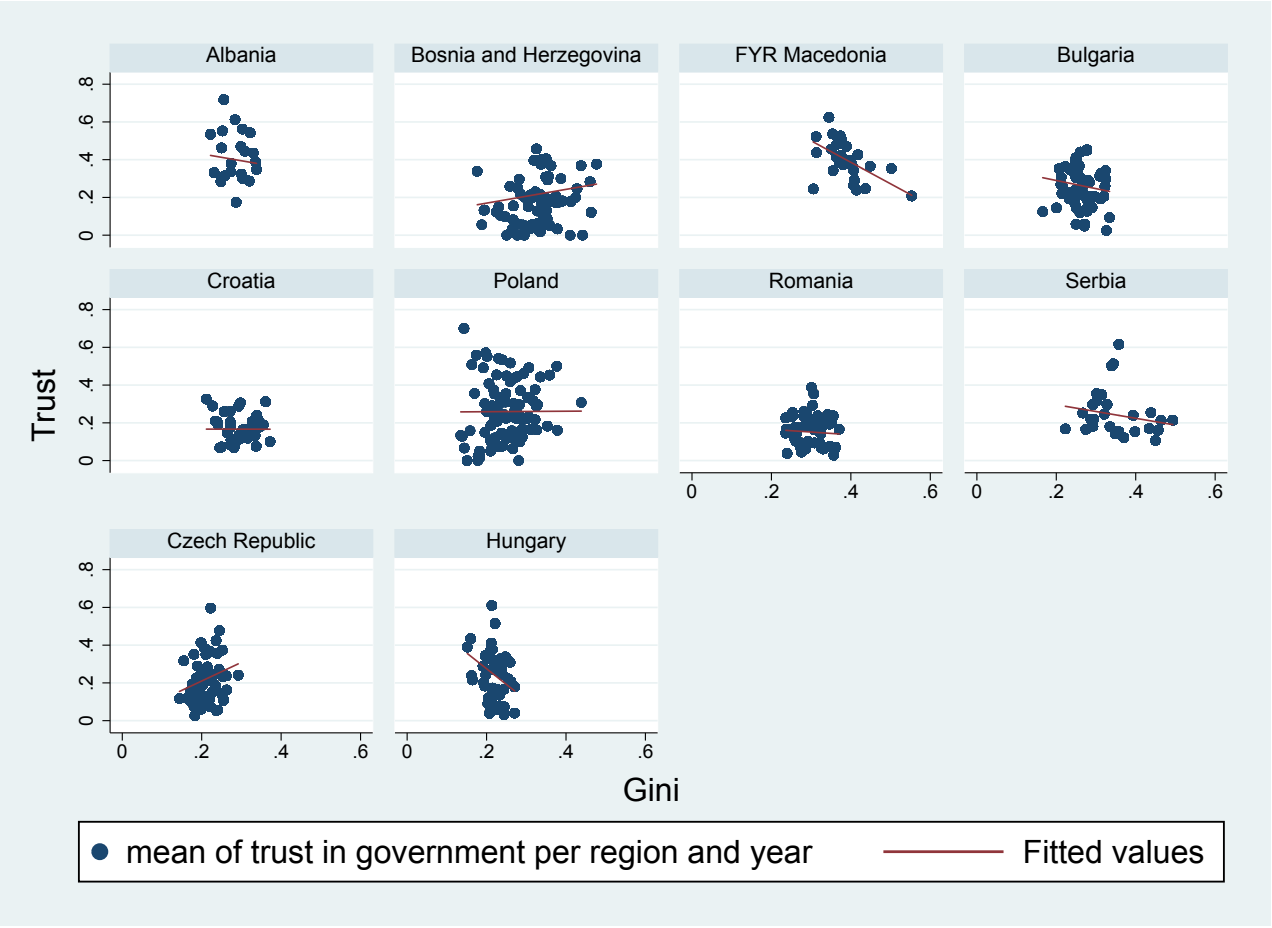

Figure 4: Trust in Government per region and year for all sample countries, 2009-2015.
Source: OeNB Euro Survey, own calculations.

4 Data and Methodology

4.1 Data

This paper is based on data from the OeNB Euro Survey, which is a household survey performed in ten CESEE countries, commissioned by the Austrian Central Bank. The survey was performed bi-annually between 2007 and 2013. Since 2014 only one wave has been conducted. The survey includes six EU members (Bulgaria, Croatia, Czech Republic, Hungary, Poland and Romania) and four EU (potential) candidate countries (Albania, Bosnia and Herzegovina, Serbia and FYR Macedonia). In each country and per wave, the target population comprises of 1000 interviewees representative of the country's population, who are persons 14 years or older, selected via a multi-stage stratified random sampling procedure, which leaves us with a total number of observations of nearly 100 000.

The survey includes questions on the use of the euro in household's portfolio, both for deposits and loans and the purpose of the latter, but also on different sentiments and experiences. It also collects information on socio-demographic characteristics, including income, age, education and employment status. Thereby, the question on trust in national governments or council of ministers is posed on the individual level, starting in 2009 [8]. Actually, the question on trust in national governments is one out of five questions on trust in different institutions such as the European Union, police, national parliament and the banking sector.

Our other main variable of interest relates to the income question from which we have constructed the Gini-coefficient as our preferred income inequality measure. In contrast to the trust-question, which is on the individual level, this question refers to the income of the household after taxes [9]. We therefore use these data on income to compute the two income inequality measures used in our paper: the Gini coefficient and the 90/10-ratio

[8] The institutional trust- question as posed in the survey states: "Please, tell me if you tend to trust or tend not to trust government/cabinet of ministers. 1 means "I trust completely", 2 means "I somewhat trust", 3 means "I neither trust nor distrust", 4 means " I somewhat distrust" and 5 means "I do not trust at all". For the analysis, we transformed the variable from a categorical to a binary variable by adding up people who at least somewhat trust versus the alternative with people distrusting.

[9] The question on income has been asked in the following way:"What is the total monthly income of the household after taxes?". The respondents have been asked to put their income in 20 categories, which have been defined so that at most 10 percent of respondents are in each category. Subsequently, the ranges of the categories have been unified over the different countries and over the years.

used to check the robustness of our results. Due to income categories in the survey, the Gini-coefficient is based on mean income in each category instead of using individual absolute incomes as is usually the case in the empirical literature.

We also exploit the regional dimension and the respective regional data of each of the countries surveyed. The regional dimension broadly corresponds to the NUTS 2 regions leaving us with 77 regions. The regional analysis, i.e the within-country analysis, is key as it may indicate regional polarization or disintegration, which express structural weaknesses and should be tackled differently by policy makers.

In addition, other variables, which have been proven to be important determinants of individual trust, have been included in the estimations. In particular, the employment status, age, education and other socio-demographic characteristics have been shown to impact trust. A second block of survey-based variables shown to be correlated with trust includes sentiments about past experiences but also expectations about future economic developments of either the household or the country. We also account for macro-economic developments such as GDP per capita or EU membership, among others. In addition, variables on country-level which relate to government efficiency, rule of law and corruption have been included as well as they have been shown in the literature to strongly affect institutional trust. Finally, we double check the results of the latter variables by including also controls coming from the survey for trust in police, trust in the EU and implied corruption at the regional level [10]. Detailed information on the variables included in the analysis is provided in the appendix (Table 5).

4.2 Correction of income data

Before we proceed to describe the empirical strategy, this section introduces the corrections we applied in order to get suitable estimates of income and calculate regional Gini-coefficients. Survey-based data on individual or household income suffer from some serious problems such as the under-stating of high incomes or the under-sampling of high-income individuals or households. Hence, the underlying income data are likely biased downwards or, in other words, the degree of inequality is perhaps underestimated.

[10] In particular, "trust in police" is the regional share of people who at least trust somewhat in the police, while "implied corruption" corresponds to the regional share of people confirming that it is common in their country to pay in cash to avoid taxes.

In addition to these more general challenges, some corrections were necessary due to structural changes of the OeNB EuroSurvey in the period of interest. For instance, individuals were asked to report their income by choosing one of twenty income categories or ranges (e.g. 500-1000 euro). In almost all countries, income categories were split during the period of interest, yielding more precise estimates but at the same time constituting a challenge with respect to the comparability of our inequality measures over time. Additionally, top income categories are open-end categories (e.g. 2000 euro and above) which renders any attempt to calculate average income in that category an impossible task. Hence, we applied two major income data corrections.

The first correction concerns the calculations of average income at the top of the distribution. We assign a maximum income to the top-income categories in order to get estimates of average income in these categories across countries which match top income shares from either international surveys such as the EU-SILC survey (covering Poland, Croatia, Macedonia) or national surveys (Albania, Czech Republic and Bulgaria).[11] Furthermore, in Hungary, Serbia and Romania, households were asked to report their absolute incomes before 2011 (Romania and Serbia) or 2012 (Hungary) instead of income categories. Thus, for these three countries, we calculate upper boundaries for the top-income category in the following way: The mean income before 2011/2012, which exceed the lower threshold of the highest income category since 2012/2013, is formed for every year. The resulting mean income value is projected to the years where income categories are used using a linear time trend. The resulting fitted values are used as incomes for households in the top income categories from 2012/2013 onward. The only country in our sample with no comparable data available is Bosnia and Herzegovina. Therefore, the size of the categories just below the top category were used for the top category too, e.g. categories 2001-3001 and 3001-4000 preceded the top income category 4001+, hence the top income category was interpreted as 4001-5000. If the top incomes behave similar as in other countries' top categories, it would probably constitute an underestimation of the incomes in the top category. Notwithstanding some degree of arbitrary assignment of upper boundaries to top income categories, we believe that the resulting consistency of our top income shares with other surveys used extensively in the literature, remains the best strategy at hand.

[11] For Bulgaria, Albania and the Czech Republic, we used the Bulgarian Household Survey, the Albanian Living Standard Measurement Survey and the Czech Household Income and Living conditions, respectively.

The second correction of the income data is due to the change of the income categories over time. In the following, we use the alternative estimations as a robustness check to our estimates of average income. In particular, some income categories change over time in a given country, e.g. from 2007-2011, the categories 201-300 are used, whereas from 2012-2015, the categories 201-250 and 251-300 are used. This will have an effect on the calculated Gini coefficient. In order to see if this possible change in Gini estimates effects the estimation, the categories were changed back from e.g. 201-250 and 251-300 to 201-300 for a robustness check. This will, however, result in a loss of information for the years were the finer categories are available, but comparability across time will improve. To ensure comparability with the data above, also the top income categories are corrected in the same manner as described above. It turns out that corrected estimates of income inequality do not alter significantly, meaning that our estimates of the regional Gini-coefficient are robust to these changes.

4.3 Empirical Framework and Methodology

The aim of our study is to analyze what impacts individual trust in national governments based on survey data on the individual level. We are interested in individual, household but also regional and country-level characteristics which may be correlated with institutional trust. When units are clustered, as it is the case in our analysis, the conventional probit regression analysis might be not appropriate. Households within the same region or country tend to be more similar than households in different regions or countries. Accordingly, if for this interdependency has not been accounted for, standard errors will be estimated with a downward bias. Hence, inferences about the effects of the covariates are not correct and might induce spurious "significant" results.

Therefore, we apply multilevel/nested models (Rabe-Hesketh and Skrondal (2008)). The multi-level methodology accounts for the nested nature of the data. Thereby we have three levels of nested clusters: country, region and individual levels and assume random effects at all levels of clusters. We consider a three-level model, where for a series of independent clusters at the country level and conditional on a set of fixed effects x and a set of random effects u

$$Pr(y_{ijkt} = 1|x_{ijkt}, u_j, u_k) = H(x_{ijkt}\beta + z_{ijkt}u_j + z_{ijkt}u_k)$$

for k=1,..,10 clusters at the level three (i.e countries), j=1,...,77 clusters at the level

two (i.e regions) consisting of i=1,...,n observations (i.e level one). In addition, the time dimension is t= 2009,...,2015 leaving us with a total number of observations of around 96000.

Accordingly, in the paper we estimate a multilevel probit for the period 2009-2015 for individuals from 10 CESEE countries with a dummy variable at the individual level as a dependent variable taking values of 1 (in case of at least somewhat trust) and 0 (no trust). The individual information includes main socio-demographic characteristics. At the regional level we include our main variable of interest- regional GINI coefficient but also individual sentiments aggregated on this upper level. Finally, the macro-level comprises variables which are ether related to features of the functioning of the government i.e efficiency or economic convergence (i.e GDP per capita).

Applying the multilevel approach enables that for the heterogeneity of the different regions has been accounted for by giving a different coefficient i.e thus catching the effect that households within one region are more likely to be influenced by common factors rather than households in different regions. The same line of thinking applies also for the regional dimension, where regions within the same country are more likely to be influenced by the same factors, which is less likely so if applied to regions in different countries. The suitability of the multilevel approach for our data and research question has been confirmed as well by Bryan and Jenkins (2013), who claim that standard multilevel estimators are consistent only when both the number and size of the groups are large with a minimum number of groups (i.e countries in our setting) to be at least 10.

An additional challenge of our estimations is endogeneity i.e that some of the covariates on individual level might be induced by trust and not only vice versa. For instance, it could well be that higher trust in institutions correlates and causes that people expect that the economic situation of their country will improve in the coming years. Not accounting for this aspect might get biased coefficients. Therefore, we aggregate these variables to a regional level.

We present our results in three main tables. First, Table 1 shows our four main estimations on the micro-economic level. In particular, next to the income distribution measures also socio-demographic controls (1), sentiments about past developments (episodes of significant inflation) and expectations for the future (economic situation of the country or the household surveyed) (2), a trust index calculated for the regional level (3) and finally

for the religion of responding individuals has been accounted for (4). Second, in Table 2 we check for the influence of macro-economic variables we also include six specifications in addition to the micro-level analysis: (1) GDP per capita, (2) government efficiency, (3) whether an election was held between 2009 and 2015, (4) a measure for the rule of law, (5) whether countries are members of the EU and, (6) government corruption as measured on the one hand by an index and on the other hand by a measure which accounts for perceived corruption and comes from the OeNB Euro Survey. Marginal effects and comprehensive robustness checks are reported in subsection 5.1 and section 6, respectively.

5 Results

5.1 Main estimations

The estimations in Table 1 present the micro-level results and include information from the OeNB Euro Survey only. Apart from the income distribution measure on the regional level, we include measures for individual income which is the relative position of individuals in the regional income distribution and a dummy variable for respondents who declined to report their income assuming that they represent, to a large extent, the upper tail of the income distribution. In line with our expectations, the regional Gini-coefficient has an overall negative and significant impact on trust. Accordingly, the decrease in regional income inequality (as shown in the descriptive evidence in Section 3) went hand in hand with an increase of the share of respondents, who (at least to some extent) trust national governments. A position in a higher decile of the regional income distribution is supportive for trust, which could be explained by a more frequent interaction of richer respondents with domestic institutions (in line with Fungacova et al. 2016). Alternatively, richer people have shown to generally trust more (i.e Guiso et al. (2004)), while economic hardships impact trust negatively and even more so in countries with an insufficiently developed system of social transfers. In addition, respondents refusing to make an entry for their income seem to trust more as well, thus most likely positioning them in the upper end of the income distribution.

Table 3 also includes estimations with important socio-demographic variables usually controlled for in the empirical trust literature (e.g age, education, employment status). As for age, very young respondents (14-18 years) and respondents older than 55 years trust

more than the middle-aged, which could be explained through the channel of social trust. Thereby, a life-cycle effect could be key as people pile up more experiences and become more trusting. An alternative explanation is the generational effect- today's older adults have experienced times with more fertile seed bed for social trust, which could well be the case before the fall of the Iron curtain for most of the CESEE-countries. In line with similar studies on institutional trust (i.e Medve-Bálint and Boda (2014), people with higher education tend to overall trust more their national governments. Therefore, in spite of elevated levels of corruption in some of the countries of our sample, we cannot confirm findings in the literature that while education makes it easier for citizens to acquire and process information about the quality of democratic institutions, higher education might have an adverse effect on trust in more corrupt countries (Hakhverdian and Mayne (2012)).

Going further, all employment categories trust less than retired respondents which is the reference category. The effect is particularly prominent for unemployed, while students tend to barely differ from pensioners. Finally, we also confirm a finding in other studies that religious people generally trust more (Guiso et al. (2003)), whereas atheists trust significantly less than the reference category (*muslim*). In contrast, our findings do not indicate that more hierarchical religions tend to trust less as reported by Fungacova et al. (2016). Interestingly, more hierarchical religions (e.g. catholic) seem to not significantly correlate with trust in national governments implying that most likely other factors such as minority affiliation could be at play. On the contrary, respondents with an orthodox religion tend to even trust significantly more than the reference category. In addition, as the information on religion is available only from 2012 onwards and thus shortens the period of observation, the regional Gini coefficient remains negative but does not have a significant impact on institutional trust.

Furthermore, we make use of survey information on households' sentiments about future and past developments, which could impact trust in national governments. To address likely concerns about the endogenous relation between institutional trust and sentiments about the economic situation of the country or the financial situation of the household, we aggregate the sentiment variables on the regional level. Interestingly, only respondents expecting improvement of the economic situation of the country tend to trust more in their national governments.[12] In addition, the average level of trust in a region (i.e defined as

[12]The rest of the included sentiment variables does not turn out to be significant in neither of the estimations to follow.

the average of trust levels in police and the banking sector) also positively impacts trust.

Finally, the interclass variance i.e rho is shown (the last line in 3), which estimates what share of the variance among the individuals could be explained by the covariates at regional level. [13] Accordingly, rho varies between 0.033 and 0.091 thus giving the intuition that the regional variation explains up to 9.1% of the total variance of the estimations.

Table 1: Impact of Income Inequality - Micro-level Analysis

	(1)	(2)	(3)	(4)	(5)
Income and Distribution					
regional gini coef		-1.07**	-0.64***	-0.25 *	-0.25
		(0.36)	(0.19)	(0.24)	(0.41)
ind position income dist		0.02***	0.02***	0.02***	0.03***
		(0.00)	(0.00)	(0.00)	(0.01)
ind income na		0.11*	0.12**	0.12**	0.11
		(0.04)	(0.04)	(0.04)	(0.06)
Socio-demographics					
14 to 18 years old		0.14***	0.15***	0.16***	0.11
		(0.03)	(0.03)	(0.03)	(0.06)
19 to 34 years old		-0.01	-0.01	-0.01	-0.05*
		(0.02)	(0.02)	(0.02)	(0.02)
55+ years old		0.05	0.05	0.05*	0.06
		(0.02)	(0.02)	(0.02)	(0.03)
Female		0.02	0.02	0.01	0.02
		(0.01)	(0.01)	(0.01)	(0.02)
1 person HH		-0.02	-0.02	-0.02	-0.03
		(0.02)	(0.02)	(0.02)	(0.03)
2 Person HH		-0.04*	-0.04*	-0.04*	-0.04
		(0.02)	(0.02)	(0.02)	(0.03)
Children		-0.03	-0.03	-0.03	-0.01
		(0.02)	(0.02)	(0.02)	(0.02)
Head of HH		0.03	0.03*	0.02	0.01
		(0.01)	(0.01)	(0.01)	(0.02)
secondary education		-0.01	-0.01	-0.00	-0.03
		(0.02)	(0.02)	(0.02)	(0.03)
tertiary education		0.08***	0.08**	0.09***	0.08**
		(0.02)	(0.03)	(0.02)	(0.03)
student		-0.06	-0.07	-0.08*	-0.03

Continued on next page

[13] The interclass variance is defined as

$$\rho = \frac{\sigma^2_{u_0}}{\sigma^2_{u_0} + \sigma^2_e}$$

,which is the share of the between- variance in total variance. Stated differently, this coefficient would give what share of the variation could be explained by the variables from different levels (i.e region and country).

Table 1 – *Continued from previous page*

	(1)	(2)	(3)	(4)	(5)
		(0.04)	(0.04)	(0.04)	(0.03)
unemployed / other		-0.14***	-0.14***	-0.14***	-0.17***
		(0.02)	(0.02)	(0.02)	(0.03)
working		-0.07*	-0.07*	-0.07**	-0.09**
		(0.03)	(0.03)	(0.03)	(0.03)
self employed		-0.07*	-0.07*	-0.07*	-0.14***
		(0.03)	(0.04)	(0.04)	(0.03)
atheist					-0.16***
					(0.05)
orthodox					0.12*
					(0.06)
catholic					-0.02
					(0.05)
protestant, other christian					0.08
					(0.07)
other					-0.10
					(0.13)
Sentiments					
restricted access to savings			-0.12	-0.01	0.41
			(0.28)	(0.17)	(0.21)
future fin sit hh			-0.18	-0.24	-0.50
			(0.32)	(0.22)	(0.26)
memories infl			0.01	0.19	-0.44
			(0.32)	(0.32)	(0.26)
future econ sit country			2.05***	1.36***	2.13***
			(0.21)	(0.20)	(0.32)
trust index			2.46***		
			(0.18)		
_cons	-.743***	-0.12 ***	-1.15***	-2.16***	-0.95***
	(0.12)	(0.13)	(0.22)	(0.22)	(0.20)
Intraclass correlation coefficient (rho)	.091	.042	.035	.026	.033
N	98014	96943	96943	96943	38673

Dependent variable: trust in national governments (dummy variable taking value of one if respondents trust or somewhat trust the national government). Estimation method: multi-level modeling. Country and time fixed effects included. Intraclass correlation coefficient denotes the unexplained correlation on the second regional level. Robust standard errors in parentheses.Variables are defined in appendix.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2 reports the results for our six specifications which, in addition to variables already presented in the micro-level analysis, include various macro-economic variables.[14]

[14]In various estimations we found that indicators of the business cycle, e.g. GDP growth, GDP per capita growth, inflation and unemployment, are not statistically significant and therefore we have not reported these estimations in the paper. Results are available, however, upon request.

Interestingly, the negative impact of regional income inequality becomes even more significant compared to our micro-level analysis (see columns 1 to 6).[15] Furthermore, the individual position in the income distribution and those households who refused to report their income have higher trust in national governments. Perhaps these households have an important reason to trust national governments if our assumption is correct and they are the richest households in the society. Overall, with respect to the socio-demographic characteristics, the results of Table 2 broadly confirm the results from the micro-level analysis.[16].

Interestingly, among the macro-level variables, only GDP per capita and EU membership are statistically significant. Accordingly, individuals living in a EU member state to trust their governments overall less. One explanation for that could be a possible substitution effect whereby trust in governments is simply substituted by trust in EU, perhaps due to the higher perception of corruption of national governments compared to EU bodies. Finally, while the corruption perception index has the expected negative sign, it is statistically insignificant. We, however, can make use of the results of a question from the survey, which approximates corruption (i.e implied corruption) and there we found a significant negative effect.[17]

With regard to sentiments, households expecting the economic situation of their country to improve also tend to trust their governments more. The results are highly significant throughout all specifications (columns (1) to (6)). Column (5) reports the result on trust in the EU which is positive and highly significant as well. However, as is well known, trust in various institutions usually show high levels of correlation, meaning that somebody who trusts the EU is also more likely to trust the government, perhaps due to common underlying characteristics of the individuals such as education

[15]It is important to note again, that at this stage we could only interpret the sign of the coefficients but not the magnitude of the effects.

[16]We double checked our results by estimating the impact of country-level inequality along with the regional inequality (Table 7 in the appendix). The negative and significant impact results remained broadly unchanged.

[17]Implied corruption- variable is based on the following question: "I am going to read you some general statements and would like to know whether you agree or disagree. Please indicate your judgment on a scale from 1 (strongly agree) to 6 (strongly disagree): In my country, it is very common that people pay cash to avoid taxes."

Table 2: Impact of Income Inequality - Macro-level Analysis

	(1)	(2)	(3)	(4)	(5)	(6)
Income and Distribution						
regional gini coef	-0.576*	-0.634**	-0.719**	-0.672***	-0.474*	-0.644**
	(-2.01)	(-3.21)	(-2.64)	(-3.59)	(-2.29)	(-2.98)
ind position income dist	0.0237***	0.0242***	0.0241***	0.0242***	0.0242***	0.0240***
	(6.21)	(6.27)	(6.24)	(6.33)	(6.43)	(6.25)
ind income na	0.118**	0.120**	0.119**	0.120***	0.122**	0.119**
	(3.07)	(3.28)	(3.23)	(3.30)	(3.21)	(3.25)
Socio-demographics						
14 to 18 years old	0.146***	0.148***	0.147***	0.145***	0.153***	0.147***
	(4.29)	(4.46)	(4.35)	(4.24)	(4.66)	(4.25)
19 to 34 years old	-0.0110	-0.0102	-0.0108	-0.0108	-0.0121	-0.0108
	(-0.56)	(-0.53)	(-0.56)	(-0.56)	(-0.62)	(-0.53)
55+ years old	0.0452	0.0472	0.0467	0.0480*	0.0455	0.0464
	(1.84)	(1.93)	(1.92)	(2.00)	(1.85)	(1.88)
female	0.0183	0.0186	0.0201	0.0175	0.0186	0.0199
	(0.98)	(0.97)	(1.09)	(0.93)	(1.01)	(1.06)
1 person hh	-0.0336	-0.0301	-0.0304	-0.0291	-0.0334	-0.0308
	(-0.99)	(-0.92)	(-0.91)	(-0.88)	(-1.03)	(-0.92)
2 Person hh	-0.0413	-0.0415	-0.0410	-0.0411	-0.0438	-0.0412
	(-1.74)	(-1.79)	(-1.76)	(-1.75)	(-1.89)	(-1.76)
children	-0.0319	-0.0274	-0.0278	-0.0263	-0.0312	-0.0284
	(-1.47)	(-1.29)	(-1.31)	(-1.25)	(-1.46)	(-1.37)
head of hh	0.0122	0.0124	0.0145	0.0102	0.0121	0.0141
	(0.80)	(0.90)	(0.90)	(0.69)	(0.87)	(0.92)
secondary education	-0.00462	-0.00641	-0.00836	-0.00823	-0.00617	-0.00747
	(-0.29)	(-0.33)	(-0.45)	(-0.43)	(-0.38)	(-0.40)
tertiary education	0.0868***	0.0810**	0.0782**	0.0804**	0.0815***	0.0791**
	(4.64)	(2.97)	(3.20)	(3.03)	(3.71)	(3.09)
student	-0.0676	-0.0715	-0.0694	-0.0707	-0.0763	-0.0694
	(-1.70)	(-1.80)	(-1.72)	(-1.78)	(-1.90)	(-1.70)
unemployed / other	-0.141***	-0.144***	-0.143***	-0.145***	-0.143***	-0.144***
	(-6.65)	(-6.76)	(-6.68)	(-6.83)	(-6.88)	(-6.79)
working	-0.0732**	-0.0747**	-0.0723*	-0.0754**	-0.0750**	-0.0724**
	(-2.61)	(-2.71)	(-2.54)	(-2.64)	(-2.65)	(-2.59)
self employed	-0.0723*	-0.0731*	-0.0687*	-0.0734*	-0.0731*	-0.0703*
	(-2.10)	(-2.15)	(-1.97)	(-2.11)	(-1.98)	(-1.99)
Sentiments						
future econ sit country	2.146***	2.031***	2.081***	2.080***	1.715***	2.043***
	(10.70)	(10.48)	(8.69)	(9.93)	(7.90)	(9.79)
trustEU					1.484***	
					(7.59)	
implied corruption						-.293*

Continued on next page

Table 2 – *Continued from previous page*

	(1)	(2)	(3)	(4)	(5)	(6)
						(-1.80)
Macro-level variables						
GDP pc	0.000161***					
	(3.53)					
gov't efficiency		-0.423				
		(-1.28)				
electionheld			-0.0469*			
			(-0.84)			
rule of law				-0.484		
				(-1.63)		
EU membership					-0.193**	
					(-2.76)	
corruption index						-0.0295
						(-0.12)
_cons	-2.591***	-1.124***	-1.059***	-1.255***	-2.012***	-0.967
	(-4.70)	(-3.90)	(-3.58)	(-4.10)	(-8.09)	(-1.33)
Intraclass correlation coefficient (rho)	0.0396	0.0374	0.0373	0.0377	0.0422	0.0371
N	96943	96943	96943	96943	96943	96943

Dependent variable: trust in national governments (dummy variable taking value of one if respondents trust or somewhat trust the national government). Estimation method: multi-level modeling. Time fixed effects included. Robust standard errors in parentheses. Variables are defined in appendix.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.2 Marginal effects

To account for the economic significance of our results, we perform estimations to compute the average marginal effects of the covariates included. Thereby, while the the results in Tables 1 and 2 indicate the significance and the sign of impact of the variables, the coefficients in Table 3 show the magnitude of the impact i.e the effects as percentage points in the change of the probability of trusting in national governments. In the case of dummy variables, the marginal effects relate to the change of one category to the other and for other variables it shows the impact of one standard deviation change.

As for these results, the significance does not change in the majority of the cases. As regards the regional income inequality measure, one standard deviation increase of the regional Gini coefficient, decreases the probability of people in the CESEE countries to trust on average between 0.1 and 0.3 percentage points. The rest of the income variables maintains their significance however seem to impose a economically smaller effect than the

regional income inequality.

Table 3: Impact of Income Inequality - Marginal Effects

	(1)	(2)	(3)	(4)
Income and Distribution				
regional gini coef	-.317***	-.185**	-.194**	-.053*
	(-.316)	(.087)	(.093)	(.103)
ind position income dist	.007***	.007 ***	.007**	.008***
	(.001)	(.001)	(.001)	(.001)
ind income na	.033***	.036***	.035***	.025**
	(.011)	(.010)	(.009)	(.012)
N	96943	96943	96943	78381

Dependent variable: trust in national governments (dummy variable taking value of one if respondents trust or somewhat trust the national government). Estimation method: multi-level model. Country and time fixed effects included. Robust standard errors in parentheses. Column (1) includes a set of sociodemographic variables, column (2)- sociodemographic variables and sentiments, column (3)- adds on country-level covariates and column (4)- the implied corruption control variable. Detailed results available upon request.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6 Robustness checks

We performed several checks to test the robustness of our estimations. First, as outlined earlier in the paper, we test whether the different income category over the time impact on any way the impact of the regional Gini-coefficient. In particular, it could be that differing categories lead to an upward bias of the coefficient estimate (i.e making it less negative) due to overestimating the income inequality. The estimations in (1) confirm that the different income categories do not impact our findings about the negative and significant impact of inequality on institutional trust.

Second, we test how alternative regional income inequality measures would perform as compared to the regional Gini index. Thereby, we opted for the 90/10- ratio, which captures the situation of the richest top 10% as compared to the poorest 10%, also due to the potential drawback of the Gini coefficient to be relatively "insensitive" for developments at the tails of the income distribution. Accordingly, the results in (2) and (3) (i.e without and with variables at the country level) confirm the negative effect of income inequality on individual trust in national governments.

Third, in column (4) we tested the robustness of our results by excluding Bosnia and Herzegovina from the sample as this is the only country we were not able to perform top income correction. Interestingly, the coefficient in this case does not change its impact and significance thus proving again the robustness of our results.

Finally, to check whether the aggregation of the replies in our dependent variable matters for the results, we re-defined the trust dummy variable to be affirmative for trust if respondents have replied to "trust completely", "somewhat trust" and "neither trust or distrust". The estimation results in column (5) show that this would not alter the significance and the impact of regional income inequality.

Table 4: Robustness checks

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Income and Distribution					
gini same categories	-0.422*				
	(-1.97)				
ind position income dist	0.0240***	0.0235***	0.0235***	0.0216***	0.0202***
	(6.18)	(6.52)	(6.84)	(6.08)	(6.45)
ind income na	0.119**	0.120***	0.118**	0.111**	0.0627*
	(3.19)	(3.33)	(3.25)	(2.86)	(1.98)
inequality ratio 90/10		-0.00924*	-0.0116*		
		(-2.43)	(-2.55)		
regional gini coef				-0.576**	
				(-2.69)	
regional Gini coef alt					-0.485**
					(-1.96)
Socio-demographics					
14 to 18 years old	0.147***	0.148***	0.148***	0.157***	0.137***
	(4.34)	(4.40)	(4.65)	(4.54)	(4.58)
19 to 34 years old	-0.0102	-0.00901	-0.0107	-0.00422	0.00294
	(-0.52)	(-0.47)	(-0.55)	(-0.20)	(0.27)
55+ years old	0.0461	0.0442	0.0479*	0.0368	0.0757***
	(1.86)	(1.81)	(2.12)	(1.39)	(4.16)
female	0.0199	0.0192	0.0168	0.0218	0.0742***
	(1.08)	(1.03)	(0.90)	(1.02)	(6.16)
1 person hh	-0.0306	-0.0313	-0.0299	-0.0358	-0.0166
	(-0.91)	(-0.93)	(-0.93)	(-0.98)	(-0.89)
2 Person hh	-0.0412	-0.0418	-0.0404	-0.0524*	-0.024
	(-1.76)	(-1.82)	(-1.89)	(-2.30)	(-1.46)
children	-0.0287	-0.0264	-0.0208	-0.0298	0.0123
	(-1.31)	(-1.19)	(-1.16)	(-1.17)	(0.90)
head of hh	0.0138	0.0141	0.00867	0.0176	0.0274*
	(0.88)	(0.90)	(0.63)	(1.09)	(2.29)

Continued on next page

Table 4 – *Continued from previous page*

	(1)	(2)	(3)	(4)	(5)
secondary education	-0.00771	-0.00566	-0.00403	-0.0184	-0.0537***
	(-0.42)	(-0.29)	(-0.23)	(-1.14)	(-3.44)
tertiary education	0.0789**	0.0812**	0.0868***	0.0728**	0.0300
	(3.13)	(3.14)	(3.73)	(2.71)	(-1.26)
student	-0.0698	-0.0701	-0.0698	-0.0664	0.0908**
	(-1.74)	(-1.74)	(-1.85)	(-1.51)	(-3.28)
unemployed / other	-0.144***	-0.142***	-0.141***	-0.150***	-0.142***
	(-6.71)	(-6.56)	(-6.73)	(-6.58)	(-5.81)
working	-0.0718*	-0.0730**	-0.0749**	-0.0715*	-0.0699***
	(-2.54)	(-2.69)	(-2.79)	(-2.27)	(-3.29)
self employed	-0.0695*	-0.0711*	-0.0712*	-0.0669	-0.0602
	(-1.98)	(-2.10)	(-2.09)	(-1.69)	(-1.82)
Sentiments					
restricted access to savings	-0.135	-0.121	-0.176	-0.0875	
	(-0.47)	(-0.42)	(-0.74)	(-0.31)	
future fin sit hh	-0.111	-0.114	-0.0799	-0.155	
	(-0.37)	(-0.36)	(-0.30)	(-0.47)	
memories infl	-0.0116	-0.00564	0.0511	-0.0185	
	(-0.04)	(-0.02)	(0.17)	(-0.06)	
future econ sit country	2.058***	2.026***	2.046***	2.068***	
	(9.99)	(9.37)	(9.68)	(8.51)	
Macro-level variables					
EU membership			-0.0829		
			(-0.66)		
corruption index			0.0664		
			(0.28)		
rule of law			-0.385		
			(-0.67)		
gov't efficiency			-0.423		
			(-0.93)		
premierchange			0.151		
			(1.19)		
electionheld			-0.163		
			(-1.87)		
cabinetchange			0.0333		
			(0.26)		
Intraclass correlation coefficient (rho1)	.034	.034	.096	.038	.025
Intraclass correlation coefficient (rho2)			.057		
N	96943	96268	96268	87322	96943

Dependent variable: trust in national governments (dummy variable being one if respondents trust or somewhat trust the national government). Estimation method: multi-level modeling. Time fixed effects and a constant included. Robust standard errors in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

7 Concluding remarks

This paper sheds light on the determinants of trust in national governments in ten Central, Eastern and Southeastern Europe (CESEE) countries in the period 2009-2015. Using data from the OeNB Euro Survey we investigate determinants of institutional trust with a special focus on income inequality. More specifically, we construct a measure of regional income inequality (Gini-coefficient), which is the first attempt for most of the countries in our sample. We employ multi-level regressions in order to exploit the various dimensions of the data (i.e individual, regional, country-level) and tackle possible problems related to endogeneity issues. The results suggest, first, that individual trust in national government is overall lower in EU member states than in EU (potential) candidate countries. Furthermore, our results show that income inequality and trust in national governments are negatively and significantly correlated, validated by including standard explanatory variables (both micro- and macro-level) and by conducting robustness checks. In addition, our analysis shows that institutional trust in the CESEE countries tends to be pro-cyclical,is influenced by corruption perception and correlates positively with the general regional trust level.

The impact of age and education reveal, to some extent, a CESEE-specific pattern. Older respondents trust most, which might be explained by experience from times when social trust was widespread (i.e. before the fall of communism). Perhaps more interestingly, sentiments about past events and the future are not significant throughout most specifications with the exception of individuals anticipating a better economic future for their country. This variable is positive and highly significant in all estimations. Macro-level control variables seem to be less important for trust in governments, with GDP per capita and EU membership being the only exception. The Corruption Perception Index of the CESEE-region, for instance, lies well above the average of the European Union. However, including corruption (as measured by the CPI), is not significant from a statistical point of view.

Despite our confidence in the robustness of the results, some shortcomings should be mentioned. First, the underlying characteristics of the overall decline of income inequality should be closely looked at as the Gini-coefficient is far from being a perfect measure of income inequality, hence, there is need for other measures, in particular at the very top of the distribution. Alternative sources such as tax records constitute a potential alternative, although data is not readily available at the moment. Second, a more thorough analysis would be needed to understand the interplay between income inequality and trust

in national governments, given different levels of income inequality, i.e whether there is a certain threshold level as was shown to be the case for some other Eastern European economies. Third, understanding the determinants of income inequality in the CESEE countries is key to understand the specific pattern and level of development of income inequality and thereby its the impact on institutional trust.

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Appendix

Table 5: Variable Description

Individual level	
Trust in national governments	Dummy variable taking value of one if respondents trust or somewhat trust the national government
Position in income decile	Variable ranging between 1 and 10 and expressing in which decile of the regional income distribution the respondent is positioned.
Income NA	Dummy variable taking the value one if respondents have not made an entry to their income.
Age	Dummy variables taking value one if respondents were in one of the age ranges (14-18 years old, 19-34 years old, 55+ years old). Omitted category is 35-54 years old.
Female	Dummy variable that takes the value one if the respondent is female.
Size of household (one person,two persons)	Dummy variables that take the value one if the respondents live in a single household or in a household with two people. Omitted category: household with three or more people.
Children	Number of children aged 6 years and younger.
Head of household	Dummy variable that takes the value one
Education (low, medium, high)	Dummy variables, degree of education (university level, medium level and basic education), omitted category: education low.
Employment status	Dummy variable coded as one if respondent belongs to selected occupational category (student, unemployed/other, working, self-employed). Omitted category: retired
Religion	Dummy variables coded as one if respondent belongs to selected religion category (atheist, orthodox, catholic, protestant or other christian, other religion). Omitted category is Islam.
Regional level	
Regional gini	Variable measuring income inequality constructed per region and year.
LC stable and trustworthy	Dummy variable taking the value of one if the respondent perceives the local currency to be stable and trustworthy in the coming five years.
Memories of restr deposits	Dummy variable taking the value of one if the respondent remember times where the access to deposits was restricted
Fin sit of household	Dummy variable taking value of one if respondent expects that the financial situation of his/her household to improve in the coming 12 months.
Econ sit my country improve	Dummy variable taking value of one if respondent expects that the economic situation of the country will improve in the following five years.

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Table 5 – *Continued from previous page*

Trust index	Index giving the average share of respondents trusting either police or banks in a region. Source: OeNB Euro Survey.
Trust in EU	Regional share of people trusting in the EU. Source: OeNB Euro Survey.
Implied corruption	Regional share of people giving an affirmative answer to the question on whether it is widespread in the own country to pay cash to avoid taxes. Source: OeNB Euro Survey.
Country level	
Country gini	Variable measuring income inequality at the country-level per year. Source: OeNB Euro Survey, own estimation.
GDP per capita	GDP in ppp per capita. Source: AMECO database.
Gov't effectiveness	perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies, Balance statistics varying between -2.5 (weak) and +2.5 (strong). Source: World Governance Indicators (World Bank).
Election held	Dummy variable taking value one if in a year parliamentary election have been held, zero otherwise. Source: European Election Database.
Rule of law	Reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence, Balance statistics varying between -2.5 (weak) and +2.5 (strong). Source World Governance Indicators (World Bank).
EU membership	Dummy variable being one if the country is a EU member state, zero otherwise.
Corruption index	Index varying between 0(highly corrupt) and 100 (clean). Source: Transparency International.

Table 6: Trust in national government by socio-demographic groups (averaged over 2009 to 2015), in %

	Albania	**Bosnia**	**Macedonia**	**Bulgaria**	**Croatia**	**Poland**	**Romania**	**Serbia**	**Czech Republic**	**Hungary**
Average	38.92	22.25	40.28	25.99	17.70	26.52	15.69	21.92	22.17	24.19
Age										
14 to 34 years	39.31	22.39	40.13	26.39	17.75	26.13	15.52	21.88	22.39	23.68
35 to 53 years	38.75	22.31	40.41	26.21	17.72	26.27	15.36	21.65	22.13	24.56
55 years and older	38.65	22.12	40.22	25.43	17.71	27.54	16.02	22.19	21.95	24.17
Net household income										
Low income	38.64	22.00	40.65	25.93	17.74	26.49	16.00	20.85	22.49	24.11
Medium Income	39.38	22.33	39.54	26.47	17.84	26.57	15.59	22.30	22.00	24.16
High Income	38.69	22.43	40.51	25.47	17.51	26.48	15.46	23.20	21.96	24.36
Employment status										
Retired	38.68	22.13	40.28	25.09	17.62	27.43	16.10	22.07	23.29	23.81
Student	39.23	22.50	40.42	26.55	17.43	25.17	15.82	22.52	22.04	22.02
Unemployed/other	38.76	21.58	40.18	26.47	17.96	26.33	14.66	22.17	22.17	22.42
Employed	38.52	22.92	40.26	26.34	17.70	26.42	15.62	21.74	22.11	24.95
Self-employed	40.12	22.97	41.88	19.21	19.44	24.12	17.47	21.21	22.38	25.19
Education										
Low	39.31	21.63	18.89	43.51	17.39	17.15	22.31	8.54	19.25	25.08
Medium	38.85	21.03	40.46	25.62	18.38	28.61	15.98	23.57	23.39	23.65
High	38.64	22.86	40.22	25.99	17.43	25.86	15.49	21.03	22.31	24.11

Source: OeNB Euro Survey, own calculations.

Table 7: Impact of Income Inequality - Country Ginis

	(1)	(2)	(3)	(4)
Income and Distribution				
regional gini coef	-0.42	-0.09	0.23	-0.46
	(0.37)	(0.30)	(0.21)	(0.29)
country gini coef	-1.63*	-1.40**	-1.22**	1.19
	(0.73)	(0.49)	(0.38)	(1.94)
ind position income dist	0.02***	0.02***	0.02***	0.03***
	(0.00)	(0.00)	(0.00)	(0.01)
ind income na	0.10*	0.12**	0.12**	0.11
	(0.04)	(0.04)	(0.04)	(0.06)
Socio-demographics				
14 to 18 years old	0.14***	0.15***	0.16***	0.11
	(0.03)	(0.03)	(0.03)	(0.06)
19 to 34 years old	-0.01	-0.01	-0.02	-0.05*
	(0.02)	(0.02)	(0.02)	(0.02)
55+ years old	0.05	0.05	0.05*	0.06
	(0.02)	(0.02)	(0.02)	(0.03)
female	0.02	0.02	0.02	0.02
	(0.02)	(0.02)	(0.02)	(0.03)
1 person hh	-0.03	-0.03	-0.03	-0.05
	(0.04)	(0.03)	(0.03)	(0.05)
2 Person hh	-0.04	-0.04	-0.04	-0.04
	(0.02)	(0.02)	(0.02)	(0.04)
children	-0.03	-0.03	-0.03	-0.01
	(0.02)	(0.02)	(0.02)	(0.03)
head of hh	0.01	0.01	0.01	-0.00
	(0.02)	(0.02)	(0.01)	(0.02)
secondary education	-0.01	-0.01	0.00	-0.03
	(0.02)	(0.02)	(0.02)	(0.03)
tertiary education	0.08***	0.08**	0.09***	0.08**
	(0.02)	(0.03)	(0.02)	(0.03)
student	-0.06	-0.07	-0.08*	-0.04
	(0.04)	(0.04)	(0.04)	(0.03)
unemployed / other	-0.14***	-0.14***	-0.14***	-0.17***
	(0.02)	(0.02)	(0.02)	(0.03)
working	-0.07*	-0.07*	-0.07**	-0.09**
	(0.03)	(0.03)	(0.03)	(0.03)
self employed	-0.07*	-0.07	-0.07*	-0.14***
	(0.03)	(0.04)	(0.04)	(0.03)
atheist				-0.17***
				(0.03)
orthodox				0.11
				(0.08)
catholic				-0.03

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Table 7 – *Continued from previous page*

	(1)	(2)	(3)	(4)
				(0.05)
protestant, other christian				0.07
				(0.07)
other				-0.10
				(0.19)
Sentiments				
restricted access to savings		-0.12	-0.01	0.41
		(0.28)	(0.17)	(0.21)
future fin sit hh		-0.18	-0.24	-0.50
		(0.32)	(0.22)	(0.26)
memories infl		0.01	0.19	-0.44
		(0.32)	(0.32)	(0.26)
future econ sit country		2.06***	1.37***	2.10***
		(0.22)	(0.20)	(0.33)
trust index			2.45***	
			(0.18)	
_cons	0.30	-0.77*	-1.81***	-1.12*
	(0.21)	(0.33)	(0.28)	(0.52)
Intraclass correlation coefficient (rho1)	.034	.034	.096	.038
Intraclass correlation coefficient (rho2)			.057	
N	96943	96943	96943	38673

Dependent variable: trust in national governments (dummy variable taking value of one if respondents trust or somewhat trust the national government). Estimation method: multi-level modeling. Time fixed effects included. Robust standard errors in parentheses. Variables are defined in appendix.

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$