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Corruption, Income Inequality and Poverty in Central and Eastern European Union Countries: A Panel Causality Analysis

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Abstract

The global wealth has increased considerably and decreases in income inequality and poverty have been experienced in the recent years. However, both income inequality and poverty have still stayed at critical dimensions. This study investigated the causal interaction among corruption, income inequality, and poverty in Central and Eastern European Union transition economies during 2005-2016 period by employing panel causality test of Dumitrescu and Hurlin (2012). The results revealed a one-way causality from poverty to corruption and also a one-way causality from income inequality to poverty.

Keywords: Corruption, income inequality, poverty, panel causality test.

JEL Classification: C23, D31, D73, I32

Orta ve Doğu Avrupa Birliği Ülkelerinde Yolsuzluk, Gelir Dağılımı Eşitsizliği ve Yoksulluk: Panel Nedensellik Analizi

Özet

Son yıllarda küresel servet önemli miktarda artmış, gelir dağılımı eşitsizliği ve yoksullukta düşüşler görülmüştür. Bununla birlikte hem gelir dağılımı eşitsizliği hem de yoksulluk hala ciddi boyutlarda bulunmaktadır. Bu çalışma Dumitrescu ve Hurlin (2012) panel nedensellik testini kullanarak Orta ve Doğu Avrupa bölgesindeki Avrupa Birliği geçiş ekonomilerinde 2005-2016 döneminde yolsuzluk, gelir dağılımı eşitsizliği ve yoksulluk arasındaki nedensel etkileşimi araştırmaktadır. Çalışma sonucunda yoksulluktan yolsuzluğa ve gelir dağılımı eşitsizliğinden yoksulluğa doğru tek yönlü nedensellik belirlenmiştir.

Anahtar Kelimeler: Yolsuzluk, gelir dağılımı eşitsizliği, yoksulluk, panel nedensellik testi.

JEL Sınıflandırması: C23, D31, D73, I32

Introduction

Global household wealth increased considerably as of 1980s, but both income inequality and poverty have stayed a critical issue at the global agenda. Both concepts of income inequality and poverty are related to the income. However, income inequality is about the wealth distribution among the individuals, but poverty is about the people living under a specific income level to meet basic human needs. Income inequality generally can be measured by Gini coefficient, Atkinson index, decile ratios, generalized entropy index (Theil index), Kakwani progressivity index, proportion of total income earned, and Robin Hood index. On the other side, poverty can be expressed as absolute poverty and relative poverty. Absolute poverty reflects a standard which is the same in all countries and which does not change over time (for example poverty headcount ratio at \$1.90 a day, % of population), while relative poverty reflects a standard defined in terms of the society in which an individual lives and which therefore differs between countries and over time (for example at-risk-of-poverty rate-the share of individuals whose equalized income after social transfers is below 60% of the national median equalized income).

Decreasing the income inequality and poverty reduction are among the priority targets of the all governments. Therefore, governments try to overcome the problems with structural social and economic measures. In this regard, the determinants of income inequality and poverty gain importance to design and implement the right policies. The economic development level, institutional and legal quality, corruption, investment, inflation, unemployment, trade openness, regional factors, government size, transfer payments and subsidies, share of agricultural sector in total labor force, human capital and land resources are major causes of income inequality (e.g., see Odedokun and Round, 2004; Haughton and Khandker, 2009; Hasman and Novotny, 2015). On the other side, poverty may be resulted from many economic, social, and demographic factors, household and individual characteristics, community and regional level characteristics (see Haughton and Khandker (2009) for detailed information).

Corruption can be defined in different ways. However, it can be generally defined “as the abuse of entrusted power for private gain” or “the abuse of public or private office for personal gain” (Transparency International, 2017 and OECD, 2014). Bribery, fraud, embezzlement, nepotism, extortion, and kickbacks are the generally known forms of corruption in the literature. Corruption has been suggested and empirically researched as an important cause and result of income inequality and poverty in the recent times.

Corruption can affect the economic, political and social development negatively through raising the cost of doing business, leading to waste or the



inefficient use of public resources, corroding public trust, decreasing the rule of law and in turn raise the income inequality and poverty (OECD, 2014). Also corruption can affect poverty and income inequality through the channels of biased tax systems, human capital formation, education, and factor accumulation uncertainty (Gupta et al., 2002).

The transitional economies of the European Union (EU) have covered a significant distance in institutional, economic and social outlook during the transformation from centrally planned economies to market economies after Communist Bloc collapse as of late 1980s. Furthermore, EU negotiations made a significant positive contribution to the social, economic and institutional transformation of these countries. Consequently, the EU transition economies have experienced significant improvements in the corruption. In this context, this study analyzed the casual interaction among corruption, income inequality and poverty in EU transition economies during the period 2005-2016 and the paper will be one of the early studies investigating the causal interaction for this group of countries. The next section summarizes the relevant literature, and Section 3 describes the dataset and econometric methodology. Then Section 4 presents empirical analysis and major findings of the empirical analysis and Section concludes.

Literature Review

Corruption has many social, economic, and political outcomes for the societies depending on the corruption type. Therefore, many researchers have conducted empirical analyses about the causes and results of the corruption (e.g. see Begovic, 2007; Olken and Pande, 2012; Dimant and Schulte, 2016 for detailed information about the nature of corruption). However, a few empirical studies researched the impact of corruption on poverty and income inequality and discovered that corruption aggravated both poverty and corruption consistently with theoretical expectations (e.g. see, Gupta et al., 2002; Dincer and Gunalp, 2008; Negin et al., 2011; Dobson and Ramlogan-Dobson, 2014; Ildırar and İşçan, 2015; Ullah and Ahmad, 2016)

In one of the early studies, Gupta et al. (2002) analyzed the impact of corruption on both income inequality and poverty during the 1980–1997 period with panel regression and revealed that corruption raised the income inequality and poverty. On the other side, Dincer and Gunalp (2008) researched the effect of corruption on poverty and income inequality in 50 US states over the period 1981-1997 with panel regression analysis and revealed that corruption increased both poverty and corruption.

Some empirical studies analyzed the interaction between corruption and income inequality. In one of the studies, Li et al. (2000) and Chong and



Calderon (2000) analyzed the relationship between corruption and income inequality in the countries of different income levels and discovered an inverse U shaped interaction between two variables. Mehrara et al. (2011) analyzed the impact of corruption on income inequality in OECD and OPEC countries during 2000-2007 period with dynamic panel regression and revealed that corruption decreased the income inequality in OPEC countries, while corruption increased the income inequality. Dobson and Ramlogan-Dobson (2014) also researched the interaction among corruption, income inequality, and shadow economy in 21 Latin American countries and 137 developing and developed countries with panel regression analysis and revealed that corruption raised the income inequality in overall panel, but decreased the income inequality in Latin American countries. However, the effect of corruption on income inequality depended on the shadow economy. The effect of corruption on income inequality decreased as the shadow economy increased. On the other side, Ullah and Ahmad (2016) also analyzed the effect of corruption on income inequality in 71 developing and developed countries during the period 1984-2012 with dynamic panel regression and discovered that corruption increased inequality.

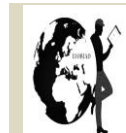
Some empirical studies have focused the impact of corruption on poverty. In this regard, Negin et al. (2011) researched the causal interaction between corruption and poverty in of 97 developing countries during the period 1997-2006 with dynamic panel regression and revealed a two-way causality. Ildırdar and İřcan (2015) also researched the impact of corruption on poverty in 16 Eastern Europe and Central Asia countries during the period 2003-2014 with dynamic panel regression and discovered that corruption raised the poverty. Ajisafe (2016) investigated the effect of corruption on the poverty in Nigeria during period 1986-2014 with ARDL bound test and found that corruption increased the poverty.

Data and Econometric Methodology

We analyzed the causal interaction among corruption, income inequality, and poverty in 10 Central and Eastern European Union countries with Dumitrescu and Hurlin (2012) panel causality test.

Data

The control of corruption index from worldwide governance indicators of World Bank (2017) was used as a proxy for corruption and the index varies from -2.5 to 2.5 (better governance) (see Kaufmann et al. (2010) for detailed information). On the other side, inequality was represented by the income quintile share ratio and the ratio is the ratio of total income received by the



20 % of the population with the highest income to that received by the 20 % of the population with the lowest income (Eurostat, 2017a). Finally, people at risk of poverty or social exclusion was employed as a proxy for poverty (Eurostat, 2017b).

Table 1: Data description

| Variable | Description | Source |
|----------|---|-------------------|
| COC | Control of corruption index | World Bank (2017) |
| INE | S80/S20 income quintile share ratio (%) | Eurostat (2017a) |
| POV | People at risk of poverty or social exclusion (%) | Eurostat (2017b) |

The existence of data determined the sample and the sample consisted of Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. Furthermore, the econometric analyses were implemented with the software packages of E-views 9.0 and Stata 14.0.

Econometric Methodology

First, the cross-sectional dependence among the series was investigated with Lagrange multiplier (LM) test of Breusch and Pagan (1980) because time dimension ($T=12$) was found to be higher than cross-section dimension ($N=10$), then the integration levels of the series were examined with Maddala and Wu (1999) panel unit root test. Finally, the causal interaction among corruption, income inequality, and poverty was analyzed with Dumitrescu and Hurlin (2012) causality test.

Dumitrescu and Hurlin (2012) causality test considers the cross-sectional dependence among the cross-sections of the panel and this method can be applied in case time dimension is larger than cross-sectional dimension and it also yields efficient results in unbalanced panel data sets (Dumitrescu and Hurlin, 2012). The casual relationship between Y and X is tested by the following model ((Dumitrescu and Hurlin, 2012)):

$$Y_{i,t} = \alpha_i + \sum_{k=1}^K \gamma_i^k Y_{i,t-k} + \sum_{k=1}^K \beta_i^k X_{i,t-k} + \epsilon_{i,t} \quad (1)$$

If (1) numbered equation K denotes optimal lag length. The null hypothesis of the test is there is no causality relationship from X to Y in all the cross-sectional units, while alternative hypothesis is that there is causality from X to Y in some cross-sectional units. Dumitrescu and Hurlin (2012) calculates individual Wald statistics ($W_{i,T}$) for each cross-sectional unit, then calculated the Wald statistics of the panel (W_{NT}^{HNC}) by taking arithmetic average of the



individual Wald statistics. Dumitrescu and Hurlin (2012) suggests the use of $Z_{N,T}^{HNC}$ test statistics with asymptotic distribution when $T > N$, and Z_N^{HNC} test statistics with semi-asymptotic distribution when $T < N$.

$$Z_{N,T}^{HNC} = \sqrt{\frac{N}{2K}} (W_{N,T}^{HNC} - K) \quad (2)$$

$$Z_N^{HNC} = \frac{\sqrt{N} [W_{N,T}^{HNC} - N^{-1} \sum_{i=1}^N E(W_{i,T})]}{\sqrt{N^{-1} \sum_{i=1}^N \text{Var}(W_{i,T})}} \quad (3)$$

Dumitrescu and Hurlin (2012) calculates the test statistics and their probabilities by using Monte Carlo simulation.

Empirical Analysis

The causal interaction among corruption, income inequality, and poverty in 10 Central and Eastern European Union countries were analyzed with Dumitrescu and Hurlin (2012) panel causality test.

Results of cross-sectional dependency test

The cross-sectional dependence among the series was investigated with LM test of Breusch and Pagan (1980) and the results were displayed in Table 2. The null hypothesis, there is cross-sectional independence, was accepted, because p value was found to be higher than 10%. So we concluded that there was cross-sectional dependence among the series. Furthermore, we analyzed homogeneity with delta tilde test and adjusted delta tilde test of Pesaran and Yamagata (2008) and our findings revealed that null hypothesis, there is homogeneity, was rejected and the cointegrating coefficients were found to be heterogenous.

Table 2: Results of cross-sectional dependence and homogeneity tests

| Cross-sectional dependency tests | | |
|----------------------------------|-----------|---------|
| Test | Statistic | p-value |
| LM (Breusch and Pagan (1980)) | 52.9 | 0.1954 |
| LM adj* (Pesaran et al. (2008)) | -0.0447 | 0.9643 |
| LM CD* (Pesaran (2004)) | 1.489 | 0.1366 |
| Homogeneity tests | | |
| Test | Statistic | p-value |
| Delta_tilde | 3.822 | 0.000 |
| Delta_tilde_adj | 4.593 | 0.000 |

*two-sided test



Results of panel unit root test

Maddala and Wu (1999) panel unit root test was used to analyze the integration levels of the variables and the results were displayed in Table 3. The results revealed that INE and POV were I(0), while COC was I(1).

Table 3: Results of Maddala and Wu (1999) panel unit root test

| Variables | Constant | Constant + Trend |
|-----------|--------------------|--------------------|
| COC | 14.914 (0.781) | 11.777 (0.924) |
| D(COC) | 56.076 (0.000)*** | 33.392 (0.031)** |
| INE | 47.376 (0.001)*** | 59.782 (0.000)*** |
| D(INE) | 211.052 (0.000)*** | 119.239 (0.000)*** |
| POV | 46.849 (0.001)*** | 62.301(0.000)*** |
| D(POV) | 67.374 (0.000)*** | 32.858 (0.035)** |

* significance at 1% level

Dumitrescu and Hurlin (2012) Panel Causality Test

The causal interaction among corruption, income inequality, and poverty was investigated with Dumitrescu and Hurlin (2012) causality test and the results were displayed in Table 4. The results revealed a one-way causality from poverty to control of corruption and a one-way causality from income inequality to poverty.

Table 4: Results of Dumitrescu and Hurlin (2012) causality test

| Null hypothesis | W-Stat. | Zbar-Stat. | Prob. |
|---------------------------------------|---------|------------|--------------|
| INE does not homogeneously cause DCOC | 2.25661 | 0.96745 | 0.3333 |
| DCOC does not homogeneously cause INE | 2.05499 | 0.73974 | 0.4595 |
| POV does not homogeneously cause DCOC | 4.45597 | 3.45137 | 0.0006 |
| DCOC does not homogeneously cause POV | 1.85872 | 0.51807 | 0.6044 |
| POV does not homogeneously cause INE | 2.52506 | 1.51079 | 0.1308 |
| INE does not homogeneously cause POV | 4.46015 | 3.96396 | 0.0000 70 |

* Lag length was taken as 1.



Conclusion

Global economy has experienced significant increases in global household wealth, in turn led decreases in income inequality and poverty, but both income inequality and poverty still has been at critical levels in the world. In this study, causal interaction among corruption, income inequality and poverty was investigated with panel causality test of Dumitrescu and Hurlin (2012). The results revealed a one-way causality both from poverty to the corruption and from income inequality to the poverty. In other words, poverty was found to be a significant cause of corruption, while income inequality was a significant cause of poverty. Therefore, measures fighting poverty also will be effective on corruption. Furthermore, policies decreasing the income inequality will be effective on poverty alleviations.

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