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# OECD Anti-Bribery Policy and Structural Differences Inside the EU

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## **Abstract:**

We propose a novel application of a gravity model of trade as a policy preference mapping tool that reveals areas of potential interest groups formation. We examine a hypothesis that the EU's inability of the coordinated anti-corruption effort is caused by its internal heterogeneity in preferences towards the anti-corruption policy. We focus only on anti-corruption effort against bribery in foreign transaction which is reflected in the effectiveness of the enforcement of the OECD anti-bribery convention. Using the gravity model, we estimate and compare preferences of western, eastern and Mediterranean EU members towards the enforcement of the convention. In addition to aggregate exports we estimate the model on disaggregated data and examine preferences across trading sectors and identify those industries which would support or oppose the anti-corruption policy. To analyse the hypothesis, we estimate a micro-founded augmented gravity model for bilateral exports of 131 countries within period 1995-2013. The results reveal significant differences between western and eastern EU members when the eastern countries are much more motivated to oppose the policy and to form a strong interest group also on the EU level. However, there are specific sectors which have potential to form a coalition towards the policy across all country groups. We have found out that the country origin (country group to which it belongs) is much better predictor of the policy preferences than exporting sector.

**Keywords:** gravity model; OECD anti-bribery convention; international conflict; policy preference mapping; EU heterogeneity

**JEL:** F14, F42, F51, F53, F55, O17

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## 1) Introduction

The OECD anti-corruption convention<sup>1</sup> has become one of the key elements in fighting against corruption in international business. The significance of the act has also increased since the European Union (the EU) has decided not to double the effort and “use” the convention as a part of its anti-corruption program<sup>2</sup>. Therefore, the EU anti-corruption policy related to the bribing non-EU officials is in fact defined by the OECD convention. The act demands all signatories to change their domestic laws accordingly with the convention and vast majority of the EU members has implemented appropriate legislation. However, the effectiveness of the convention has been questioned because the agreement does not include explicit enforcement clauses. In 2012 just less than one half of the signatories has ever prosecuted at least one individual or firm for foreign corruption according to the convention (Brewster, 2014).

The reluctance to enforce the act is especially sensitive issue for the EU because it reveals inability of the European community to effectively fight against corruption in foreign transactions. This paper tries to examine a potential explanation of that situation. We examine a hypothesis that the EU inability of the coordinated anti-corruption effort is caused by its internal heterogeneity which is rooted in different policy preferences of exporting sectors within the member countries. To do it we analyse exports of Western, Mediterranean and Eastern-European EU members and compare the sensitivity of their exports to the corruption in the partner countries. We focus our attention to sectoral data because we expect high heterogeneity in the results between sectors.

The cornerstone of our study is a gravity model of international trade. This class of models is usually used for analysis of various trade policy questions. We utilize the model in an innovative way as a policy preference mapping tool. Using the gravity model, we can find out whether the exports of our countries and sectors are positively or negatively correlated with corruption in the destination countries. Using these results we can then divide our EU members and sectors into those who are benefiting from the reluctance and those who would gain from effective enforcement of the act. This map of “winners” and “losers” is then in fact a map of potential interest groups opposing to the effective enforcement. We argue that a gravity model can be used as a tool for mapping of certain types of economic preferences motivating various parties to lobby for policy changes. Therefore, the gravity model in fact can identify areas of potential interest groups formation – with, of course, several discussed limitations.

The paper therefore contributes to the existing literature in both methodological and empirical aspects. Firstly, it presents up to our knowledge novel application of gravity models as a policy preference mapping tool. Secondly we examine potential heterogeneity of preferences towards anti-corruption policies within the EU as another source of uneven enforcement of the OECD anti-corruption act.

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<sup>1</sup> OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, signed in 1997.

<sup>2</sup> See notes 15 and 21 of the Communication from the Commission to the Council, the European Parliament and the European Economic and Social Committee - On a comprehensive EU policy against corruption.

The following section describes the anti-corruption policy of the EU and presents our hypotheses and aims in more detail. Section 3 then discusses the rationale behind the usage of the GM as an interest group mapping tool and then presents the model and data.

## 2) Anti-corruption conventions and the EU

The European Union has been active in anti-corruption policy in recent decades. E.g. in 1997 the EU came with its first communication on anti-corruption policy which proposed to ban tax deductibility of bribes (Arnone & Borlini, 2014) when this practice was widespread in developed countries at least till 1997 (Milliet-Einbinder, 2000). Then in 1999 the EU established its European Anti-Fraud Office (OLAF).

Other two key acts related to the internal regulation of corruption are the Convention against Corruption Involving Officials<sup>3</sup> and the Convention on the Protection of the European Communities' Financial Interests<sup>4</sup>. The first act adopted in 1997 (entry into force in 2005) act demands EU members to implement legislation ensuring that active and passive corruption by officials is a criminal activity. The second convention adopted in 1995 (entry into force in 2002) deals with financial fraud.

However anti-corruption policy of the European Union relies not only on its own acts but also on international legislation. The EU has decided not to double legislation and simply takes advantage of existing conventions and institutions<sup>5</sup>. Therefore, the EU closely cooperates with the OECD, UN and Council of Europe which established several anti-corruption acts and the EU explicitly demands its members to ratify acts especially of the Council of Europe and of the OECD<sup>6</sup>.

The OECD Anti-Bribery Convention<sup>7</sup> focuses on international transactions and binds signatories to implement national laws criminalizing bribery of foreign public officials. OECD then monitors performance of all signatories. Therefore, the OECD Anti-Bribery Convention is a crucial part of the EU anti-corruption policy against bribery in foreign (non-EU) transactions and therefore the effectiveness of the EU anti-corruption policy against this type of bribery should be evaluated according to the EU members' enforcement efforts of the OECD act. However, there are four EU members who still have not ratified the convention: Croatia, Cyprus, Lithuania and Malta.

Unfortunately, the enforcement effort of the EU signatories of the OECD Convention is diplomatically speaking low. According to the Transparency International (2015) about half of the signatories can be classified as a countries with "little or no enforcement". If we shift our attention to EU members just 46% of EU signatories have ever imposed a sanction in period 1999-2014 (see Table 1). If we take into account also EU non-signatories then the ratio is just 39%. We can see clear distinction between Western more developed members of the EU (WEC category) and their partners from the Central and Eastern Europe (CEE category) and Mediterranean countries (MED category). Western countries are simply much more active in the enforcement of the act while majority of the WEC countries has

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<sup>3</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:l33027>.

<sup>4</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:41995A1127%2803%29>.

<sup>5</sup> See page 5 of the EU Communication "[COM/2003/0317/final](http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2003:0317:final)".

<sup>6</sup> See section 3.2. (page 9) of the EU Communication "[COM/2011/308/final](http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2011/308:final)".

<sup>7</sup> <http://www.oecd.org/corruption/oecdantibriberyconvention.htm>.

imposed at least one sanction contrary to CEE or MED countries where less than 27 % (17 % respectively) of them have been successful in prosecution.

**Table 1: Enforcement of the OECD Anti-Bribery Convention**

	Number of states in the group	Number of states with enforced sanctions	% of those countries in the group	Number of sanctions	Number of states without ratification
CEE	11	3	27%	28	3
MED	6	1	17%	13	1
WEC	11	7	64%	85	0

Source: OECD 2014 Enforcement Data, CEE = Central and Eastern European members of the EU, MED = Mediterranean members of the EU, WEC = Western EU countries. Composition of the groups can be found in Table 2.

The unsatisfactory enforcement of the convention is the main object of criticism by scholars because it reduces the efficiency of the act<sup>8</sup>. Brewster (2014) finds two main reasons why the act enforcement is low. At first the treaty demands implementation of specific laws but it does not precisely specify how a country should enforce these laws. Therefore, one possible outcome is that a signatory implemented anti-corruption laws without any intention to enforce them<sup>9</sup>. Secondly, the behaviour of the actors can be described by prisoner's dilemma game. Cooperation of all agents should increase welfare e.g. because of higher economic growth or higher political stability. When all or vast majority of signatories are cooperating and criminalizing foreign bribery then a signatory can have an incentive to defect because the positive externalities of the cooperation still exist and the signatory can get more contracts using bribes.

Although there may be limitations of the act according to Cuervo-Cazurra (2008) the OECD act is in general effective because investors from signatory countries have reduced investments into corrupt countries. Souza (2012) estimated that the implementation of the convention reduces on average bilateral exports of signatories by 5.7 % to countries with higher corruption compared to countries with lower corruption. According to the author the convention increased business costs for firms which likely decreased exports to more corrupt markets or even exited them (Souza, 2012, p. 85). Souza (2012) also revealed heterogeneous effects while the decline in case of homogeneous goods has been significantly larger than in case of differentiated products. According to Spencer & Gomez (2011) the OECD convention may play also signalling role for domestic officials because they found that investors from signatory countries faced less pressure to be engaged in corrupt practices.

Empirical studies so far have found positive effects of the act to reduce trade or investments into more corrupt countries. On the other hand the uneven enforcement may reveal that the EU may suffer from lack of efficient multi-country coordination which is the key precondition for reduction of the supply of bribes and reduction of the prisoner's dilemma problem (Cuervo-Cazurra, 2008).

Our aim is to investigate preferences of three country blocks within EU towards the anti-corruption policy (reflected via enforcement of the OECD act) and reveal potential differences in those

<sup>8</sup> See e.g. Alford (2012) or Rose-Ackerman & Hunt (2012).

<sup>9</sup> For further discussion and possible solution see e.g. Carrington (2010).



preferences which would then explain the uneven enforcement of the act and identify the coordination problem.

To reveal the policy preferences we have chosen an approach based on gravity modelling. We estimate augmented micro-founded gravity model explaining exports using standard battery of explanatory and control variables which we have enriched by a corruption variable. We measure correlation between importer's corruption (quantified via CPI index) and exports. E.g. positive value of correlation would simply tell us that the exports of country X are stimulated by higher corruption of partner (importing) countries. If the correlation coefficient has different and statistically significant sign when we compare results for e.g. CEE and western EU members, then there is a structural difference in the export sensitivity to corruption which is the basis for different preferences of those groups towards OECD Convention enforcement.

In fact we focus on three specific aspects of the problem. Firstly, we search for potential differences in the export sensitivity to corruption between our country groups. We expect different results across groups while the WEC group should represent the most developed countries within the EU and therefore this group should be in favour of the policy the most. The comparison of the average CPI index of each group reveals significant difference in corruption perception. While the average CPI in year 2013 for WEC countries is 83, for Mediterranean states it is 52.5 and for CEE countries even only 46. Because the CEE and MED countries should be more corrupt than the western countries<sup>10</sup> it is reasonable to test hypothesis that the WEC has the opposite preferences (towards to policy) than the CEE and MED countries (against the policy). The rationale for the hypothesis is simply that the institutional distance to other corrupt countries is much lower for MED and CEE countries than for their western EU partners. Therefore their trade connections to more corrupt markets should be more intensive and they should be more harmed by efficient implementation of anti-corruption policy. Therefore our first hypothesis (mathematical formulations of all hypotheses can be found in the methodology chapter) is following (H1):

**The preferences of the exporters from western EU countries are opposite to preferences of exporters from CEE and MED countries.**

Secondly, we analyse the problem on aggregate but also on sectoral level data. Therefore we expect high variability of the coefficient value between examined sectors (H2):

**There is a significant variability in the sensitivity of exports to corruption between sectors.**

At last we investigate whether the results are driven primarily by country's origin or by sector type (H3):

**The variability in the corruption coefficient is driven by country origin and not by sector type.**

This utilization of the gravity model is significantly different from standard application those models because we are not interested in the coefficient value of the variable of our interest. We do not

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<sup>10</sup>

At least according to perception of citizens and country experts.

estimate quantitative expression of the effect of independent variable, corruption in our case, on the trade variable. We pay our attention only to qualitative relationship between those variables and therefore we focus only on coefficient sign which tells us whether the country would lose or not from the enforcement of the policy. In other words, the gravity model can provide us with basic map of “winners” and “losers” which is in fact a map of policy preferences on aggregate level.

We argue that this sort of preference mapping is of high policy relevance because it is the first step in the understanding of policy formation (see e.g. Hiscox (2014, p.75) talking about domestic sources of foreign policies). With the map of the policy preferences which is in our case represented by the correlation coefficient sign we can then identify areas of potential interest groups formation supporting or opposing the policy (e.g. specific sector which would be harmed by prepared legislation) following the definition of the interest group by Meissner (2015, p. 8): “a non-state entity that endeavours to influence government policy”. The correlation coefficient reveals motivation of exporters who are non-state actors to influence government policy with respect to the convention. Therefore, we believe that the policy preference mapping stemming from the gravity model also identifies potential interest group formation and resulting conflicts.

The application of the gravity model as an interest group mapping tool is a novel up to our knowledge. The gravity model (GM) has become a standard empirical tool in the International Political Economy (IPE) research (Mansfield, 2004). The IPE scholars have been incorporating political variables into the gravity models for decades. The seminal contribution has been made by Pollins (1989) who enriched the utility function of importers by another objective – international security – following a goal to at least partially bridge the gap between international economics and politics. The GM has been used in variety of topics primarily concentrating on the impacts of conflicts, political alliances or other “international relations” factors on trade (e.g. Early, 2012; Fuchs & Klann, 2013; Gowa & Mansfield, 1993; Kastner, 2007; Peterson, 2014; Peterson & Rudloff, 2015; Qureshi, 2013). However, none of those studies has ever used the gravity model as an instrument mapping interest groups and their related policy preferences. Therefore, we believe that our study methodologically contributes to the IPE research utilizing gravity models and presents another application of this instrument.

Several remarks must be made on the limitations of this approach. The policy preference map based on a gravity model is a view from a “bird’s-eye” view where we cannot reveal strong evidence of causal chains leading from individual actors to resulting state behaviour. The reason is that it is based on aggregated data on state or sectoral level and therefore we cannot speak about very individual actors. The purpose of our modelling is to provide basic or starting picture which is based on aggregate data which are easily accessible. Any more detailed studies would require case studies or firm level data with many detailed information. However, this sort of data is not easy to collect and firms may be motivated to hide their real policy preferences in various surveys. The gravity model approach is deducing these attitudes indirectly from the behaviour of the firms – from their export patterns which may represent their stances more than their official narrative reflected in the questionnaires which can be biased for political or many other reasons. The gravity model can then represent an elegant tool providing us with policy preference map and potential areas of interest groups formations and resulting conflicts. In addition it avoids the biases associated with firms’ questionnaires but on the other had it suffers from natural limitations stemming from the “birds’-eye view”.

### 3) Methodology and data

#### Data

We estimate our gravity model using bilateral panel data for the 131 countries (Appendix II) in period 1995-2013. The dependent variables will be total exports (SITC revision 3) in thousands USD and also exports on sectoral level (first-digit level SITC classification, see Appendix III). We use extensive list of explanatory and control variables<sup>11</sup> which is presented in the Appendix IV. The variable of our primary concern is a corruption level measured via the CPI index (Transparency International). We have not taken the CPI data directly from the Transparency International but we have been using data from the Heritage Foundation while the Foundation has adopted the CPI and rescaled the index to vary between 0 and 100<sup>12</sup>. Because we have been in fact using (only rescaled) the Transparency's index we will primarily talk in the methodology section about the CPI. For the purposes of the robustness check and comparisons we run the estimations also for the „Control of corruption index“ (CCI) of the World Bank and the ICRG corruption index made by the PRS Group.

There is an ongoing debate on how a corruption should be measured and what is in fact measured by the indices. Scholars mostly focus on the CPI index which has been most often used corruption index in analyses. The CPI generally measures corruption in line with corruption definition of the “misuse of public power for private benefit” (Lambsdorff, 2006b) while this definition is primarily related to corruption related to public or state officials. The definition fits to situation of foreign businessmen trying to bribe foreign officials for various reasons (get the contract, ease business regulation, bribery of custom officials etc.) unfortunately it misses all other forms of bribery of foreign companies especially corruption between private firms themselves. Therefore, the results are related only to above mentioned forms of corruption practices.

The criticism towards CPI focuses on several aspects of the index. According to Philp (2006, p. 50) the CPI suffers from partially imprecise scale as well as tendency of “Western businessmen involved in business with firms overseas” perspective. Donchev & Ujhelyi (2014) correct the opinion that perception reflects actual of corruption experience while concluding that the relationship between perception and experience is in fact no so strong within the indices. Other more detailed criticisms of the perception indices or more specifically CPI can be found e.g. in Heywood (2015), Andersson & Heywood (2009) or Galtung (2006).

However, from more pragmatic perspective there are several reasons why CPI could be used. Potter & Tavits (2011) note that the underlying sources of CPI and WB index are very similar – e.g. the ICRG index is part of them<sup>13</sup>. The indexes CPI and WB are then highly correlated (Woodruff, 2006). On the one side we can look at it as a positive feature (CPI exhibit no significantly different behaviour than the WB index) but on the other side the common basis of those indicators implies that potential weaknesses are common to both of them. According to Lambsdorff (2006b) contemporary measures of CPI should be robust to the criticism of Philp (2006) because the underlying sources have started

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<sup>11</sup> Our right-hand-side variables consist of institutional factors (Heritage Foundation), CEPII trade barrier variables, regional trade dummies (de Sousa, 2012), etc.

<sup>12</sup> For more details see <http://www.heritage.org/index/pdf/2016/book/methodology.pdf>.

<sup>13</sup> For CPI see e.g. [http://www.transparency.org/cpi2014/in\\_detail#myAnchor4](http://www.transparency.org/cpi2014/in_detail#myAnchor4) or in case of CCI following methodology description <http://info.worldbank.org/governance/wgi/cc.pdf>.

also surveying respondents from less developed countries without any significant impact on results of the final CPI. The last and very technical reason simply is that it is the largest dataset<sup>14</sup> enabling us to do large panel studies. In other words, in many cases researches do not have viable alternative.

We have decided to use the perception index CPI for several reasons. The first one is pragmatic – we cannot find any other more robust alternatives for large panel data set. Secondly, the type of corruption measured by the CPI fits many activities with corruption potential related to foreign transactions (state regulations, procurements, custom procedures, etc.). Thirdly, studies examining the relationship of perceptions and corruption experience have not concluded that there is no link between them at all (Donchev & Ujhelyi, 2014). In other words we cannot criticize perception indices that they do not represent real corruption behaviour. Fourthly, following previous reason, we assume that high or even country-wide perception of corruption ease corruption practices (or lower moral boundaries to be engaged in them). Therefore, the differences in perceptions between countries should reveal us at least higher probability of corruption practices in foreign transactions.

Throughout the rest of the article we will talk about “corruption level” or simply “corruption” with all above mentioned criticisms of perception indicators in mind.

To at least partially avoid potential “CPI specific” flaws as robustness check we have used other two corruption indices (CCI and ICRG). Because of our interest in panel of countries we chose again standard perception indicators. Important note has been made by Lambsdorff (2007) in case of the ICRG index. He stresses that the index is the not precise measure of corruption because it reflects more political instability which can be however partially caused by high corruption. Therefore, we must be more cautious when we interpret the results associated with the ICRG index<sup>15</sup>.

### Gravity model specification

The general specification of our gravity model is following:

$$\log(X_{ijt}) = \beta_0 + \beta_1 \log(Y_{jt}) + \beta_2 \log(Y_{it}) + \delta \log(t_{ijt}) + \lambda I_t + \varepsilon_{ijt} \quad (1)$$

Subscript  $i$  denotes exporters,  $j$  importers and  $t$  refers to time. Hence  $Y_{jt}$  refers to importers' GDP,  $Y_{it}$  stands for exporters' GDP,  $\lambda I_t$  denotes time dummies with respective coefficients ( $\lambda$  is a coefficient vector).  $X_{ijt}$  represents exports on aggregate but also on sectoral level and  $t_{ijt}$  stands for trade barrier dummies.  $t_{ijt}$  represents not only distance but also other forms of barriers to mutual trade (institutions, common language etc. – see Table 5 for complete list of those variables).

Our gravity model methodology follows micro-founded gravity literature with seminal contribution of Anderson & Wincoop (2003). To cope with multilateral resistance terms (MRT) we use the Taylor-approximation of the MRT presented by Baier & Bergstrand (2009). Following Shepherd (2013) we apply Taylor approximation of the MRT without GDP weights. As a result of this approximation we must include all trade barrier variables in following form:

<sup>14</sup> Compare the number of observations of our regressions of all three indices in Appendix V for the difference.

<sup>15</sup> Lambsdorff (2006b, p. 83) claims that: „Corruption only leads to political instability if it is not tolerated. Due to this, the data by PRS-ICRG does not depict levels of corruption, contrary to widespread belief.“

$$\log(t_{ijt}) = \log(t_{ijt}) - P_i - P_j \quad (2)$$

$$P_i = \frac{1}{N} \sum_{j=1}^N \ln t_{ij} - \frac{1}{2} \frac{1}{N^2} \sum_{k=1}^N \sum_{m=1}^N \ln t_{km} \quad (3)$$

$$P_j = \frac{1}{N} \sum_{i=1}^N \ln t_{ij} - \frac{1}{2} \frac{1}{N^2} \quad (4)$$

Where the  $t_{ijt}$  stands for original variable and  $P_i$  with  $P_j$  are outward and inward multilateral resistance terms.

Our goal is to reveal potentially different export sensitivity to corruption within the EU. To do it we at first divide countries into several country groups (three groups for the EU countries and one group for all others in our dataset) and construct corresponding dummy variables signalling to which group each exporter belongs. Then we multiply the corruption variable, which is one of our trade barrier variables, by those dummies and in fact we transform the variable into several time series of corruption measure related to each country group. This transformation allows us to estimate export sensitivity to corruption (estimated coefficient of the specific trade barrier variable) for each specific country group and compare potential differences. The procedure is described in more detail below.

Inspired by Sapir (2006) we have separated the EU members into three groups (Table 2): Central and Eastern European countries (CEE), Western European countries (WEC) and Mediterranean countries (MED). Firstly, the division is to separate former communist countries from other EU members. The division should reflect potential path-dependency of the former “Iron curtain” separation of Europe and hence potentially different policy preferences based on specific historical experience. Secondly, following Sapir we have created a group of Mediterranean countries which, according to Sapir, represents a specific European social model. Those countries are also sometimes regarded economically weaker countries compared to other western members of the EU. However, we have decided not to divide the remaining EU members into other groups as Sapir did (Continental, Anglo-Saxon and Nordic).

There are two main reasons for that decision. Firstly, we try to avoid extensive fragmentation of the EU. The bilateral dataset covers 131 countries therefore highly fragmented EU groups may lead to insignificant results. Secondly, from our perspective the differences among the remaining three social models were less substantial and we have decided to construct just one group for all other EU members except CEE and Mediterranean countries.

Except for those three groups we have constructed a group Rest gathering all other countries in our dataset (see Appendix II for complete country list).

**Table 2: Country groups I (EU countries)**

CEE	WEC	MED
Bulgaria	Austria	Cyprus
Croatia	Belgium	Greece
Czech Republic	Denmark	Italy
Estonia	Finland	Malta
Hungary	France	Portugal
Latvia	Germany	Spain
Lithuania	Ireland	
Poland	Luxembourg	
Romania	Netherlands	
Slovak Republic	Sweden	
Slovenia	United Kingdom	

Then we have created a dummy variable representing each group. It equals one if an exporting country belongs to the group and zero otherwise (see Table 3 for summary).

**Table 3: Country groups II**

Dummy name	description
CEE	1 if an exporter belongs to the CEE group.
WEC	1 if an exporter belongs to the WEC group.
MED	1 if an exporter belongs to the MED group.
Rest	1 if an exporter does not belong to the CEE, WED or MED group.

Because we are interested in the export sensitivity to corruption we transform our corruption variable (CPI) into several time series to estimate the sensitivity for each specific group (CEE, WEC, MED and Rest). To do it we multiply the corruption variable by the dummy for country group. A bilateral gravity model is defined in three dimensions: time, exporter and importer. There are two principal ways how to treat institutional trade barrier variables in bilateral specification. At first we can construct an institutional distance<sup>16</sup> of those variables (Kuncic, 2012). Second option is to include both the institutional quality of exporters  $t_{it}$  and importers  $t_{jt}$  into the equation (Francois & Manchin, 2013). That allows us to estimate the effects of institutions on exporters and importers separately. Because we are interested in the effects on exporters we follow the second approach.

In the following step we multiply the corruption variable measured via CPI by our country group dummies. The aim is to decompose the original time series into variables identifying corruption-trade relationship for each specific country group. Because we include institutional variables on both importer and exporter side, we have to multiply by the dummy not only the corruption variable of exporters ( $CPI_{it}$ ) but also the corruption variable of importers ( $CPI_{jt}$ ):

$$\text{New time-series} = \text{Country group dummy (exporter)} * \text{CPI (exporter/importer)}$$

<sup>16</sup>

Difference in absolute value:  $t_{ijt} = |t_{it} - t_{jt}|$

At the end we have substituted the corruption variable by 8 new time series presented in the Table 4. All 8 variables are included into the model with respective coefficients. Our primary concerns are the coefficients  $\alpha_1$ ,  $\alpha_3$  and  $\alpha_5$  because they are related to the corruption on the importer side and reflect also all EU country groups of exporters.

**Table 4: Corruption variables**

Coeff.	New corruption variables	Coeff.	New corruption variables
$\alpha_1$	CEE_CPI(importer)=CEE*CPI(im)	$\alpha_5$	MED_CPI(importer)=MED*CPI(im)
$\alpha_2$	CEE_CPI(exporter)=CEE*CPI(ex)	$\alpha_6$	MED_CPI(exporter)=MED*CPI(ex)
$\alpha_3$	WEC_CPI(importer)=WEC*CPI(im)	$\alpha_7$	REST_CPI(importer)=REST*CPI(im)
$\alpha_4$	WEC_CPI(exporter)=WEC*CPI(ex)	$\alpha_8$	REST_CPI(exporter)=REST*CPI(ex)

When we work with the institutional variables in the gravity model we should take care of two additional problems: multicollinearity and endogeneity. Institutional variables are usually highly mutually correlated. Therefore we follow approach applied by Francois & Manchin (2013) who transformed institutional variables into principal components. We do the same except that corruption variable which is the only one excluded from the PCA transformation. When constructing the PCA we followed the Kaiser's rule recommending to incorporate into the regression only those components with eigenvalues equal or higher than 1 (results of PCA analysis can be found in Appendix I). Therefore we include only two components on reporter side ( $rpc_{it}$ ) and also two on partner side ( $ppc_{jt}$ ). However, any simple correlation between institutional variable and exports can be suspicious of endogeneity while the trade flows may also influence institutional quality in a country. To deal with this problem we lagged all institutional variables by one year before we transformed them into principal components (Francois & Manchin, 2013).

To cope with the problem of zero observation of export data and to cope with heteroscedasticity of residuals we have estimated the model via Poisson pseudo-maximum-likelihood estimator (Santos Silva & Tenreyro, 2006).

The following Table 5 is summarizing all trade barrier variables and principal components included in the specification:



**Table 5: Trade barrier variables**

Variable	Value	Description
dist		Distance
ppc1		PCA of institutional variables (importer)
ppc2		PCA of institutional variables (importer)
rpc1		PCA of institutional variables (exporter)
rpc2		PCA of institutional variables (exporter)
pland	Dummy (0;1), 1 if landlocked	Landlocked (importer)
rland	Dummy (0;1), 1 if landlocked	Landlocked (exporter)
contig	Dummy (0;1), 1 if contiguous	Contiguity
comlang	Dummy (0;1), 1 if common language	Common official language
colony	Dummy (0;1), 1 if colonial link	Colonial link
smctry	Dummy (0;1), 1 if same country	Same country before
RTA	Dummy (0;1), 1 if RTA exists	Regional trade agreements
CEE_CPI(im)		See Table 4
CEE_CPI(ex)		See Table 4
WEC_CPI(im)		See Table 4
WEC_CPI(ex)		See Table 4
MED_CPI(im)		See Table 4
MED_CPI(ex)		See Table 4
REST_CPI(im)		See Table 4
REST_CPI(ex)		See Table 4

The estimated specification including all transformed corruption variables and other trade variables together with principal components is hence following<sup>17</sup>:

$$\begin{aligned}
 \log(X_{ijt}) = & \beta_0 + \beta_1 \log(Y_{jt}) + \beta_2 \log(Y_{it}) + \beta_3 \log(dist_{ijt}) + \beta_4 ppc1_{j,t-1} + \beta_5 ppc2_{j,t-1} \quad (5) \\
 & + \beta_6 rpc1_{i,t-1} + \beta_7 rpc2_{i,t-1} + \beta_8 pland_{jt} + \beta_9 rland_{it} + \beta_{10} contig_{ijt} \\
 & + \beta_{11} comlang_{ijt} + \beta_{12} colony_{ijt} + \beta_{13} smctry_{ijt} + \beta_{14} rta_{ijt} \\
 & + \alpha_1 CEE_{CPI}(\ )_{j,t-1} + \alpha_2 CEE_{CPI}(ex)_{i,t-1} + \alpha_3 WEC_{CPI}(\ )_{j,t-1} \\
 & + \alpha_4 WEC_{CPI}(ex)_{i,t-1} + \alpha_5 MED_{CPI}(\ )_{j,t-1} + \alpha_6 MED_{CPI}(ex)_{i,t-1} \\
 & + \alpha_7 REST_{CPI}(\ )_{j,t-1} + \alpha_8 REST_{CPI}(ex)_{i,t-1} + \lambda I_t + \varepsilon_{ijt}
 \end{aligned}$$

### GM and the interest group mapping (hypotheses examination)

The aim of our gravity model is to map policy preferences of three country groups of EU members towards the OECD anti-bribery act. To analyse our three hypotheses, we simply compare the coefficients  $\alpha_1$ ,  $\alpha_3$  and  $\alpha_5$ . The idea is that the coefficient sign can be used to deduce policy preferences.

The corruption variable before Taylor approximation varies between 0 and 100 when the highest value represents situation with zero corruption (measured via CPI hence the variable primarily

<sup>17</sup> Percentage variables (institutional variables – values between 0 and 100) and dummy variables are not in logs.



informs us about corruption perception – see the discussion in Data section above). Therefore, if the coefficient is negative, then there is a positive correlation between corruption level of importers and exports of our EU country group (higher trade associated with higher corruption level in a partner country). If the country belonging to that group starts enforcing the OECD act, then the exporters would be forced to orient to less corrupt markets where they lose competitive advantage of bribery. Therefore, the exporters are motivated to form a lobby against the policy. This situation is in line with interest group definition of Meissner (2015) as has been already mentioned. Hence we can talk not only about preferences mapping but also identification of areas of likely interest groups formation.

On the other side the positive coefficient represents the very opposite situation. In those countries exporters are motivated to support the policy because their exports are positively correlated with higher institutional quality of importers where the rule of law is more efficient and corrupt practices are likely to be punished (or punished more frequently than in more corrupt states).

Advantage of the gravity modelling is that we can run the estimates not only for aggregate data but also for sectoral more detailed figures.

The strategy how to examine our hypotheses is following:

**H1: The preferences of the exporters from western EU countries are opposite to preferences of exporters from CEE and MED countries.**

We expect the signs of  $\alpha_1$  (CEE) and  $\alpha_5$  (MED) are opposite to the sign of  $\alpha_3$  (WEC). In particular, we expect that CEE and MED countries would oppose the policy (negative coefficient) and WEC countries would support it (positive coefficient):

$$\alpha_1 < 0 \wedge \alpha_5 < 0 \wedge \alpha_3 > 0$$

**H2: There is a significant variability in the sensitivity of exports to corruption between sectors.**

We expect that the signs of  $\alpha_1$ ,  $\alpha_3$  and  $\alpha_5$  are not the same across sectors.

**H3: The variability in the corruption coefficient is driven by country origin and not by sector type.**

We expect that the signs of  $\alpha_1$ ,  $\alpha_3$  and  $\alpha_5$  are the same across country groups.

## 4) Results

We have estimated the model for the aggregate exports and all 10 basic (one-digit) SITC sectors. The results for CPI are summarized in the Table 6. The table presents signs only of statistically significant coefficients (at least on 10 % significance level) of all 4 country groups (rows) with CPI on the importer side. All significant negative coefficients are in red and positive in green colour. The columns then reveal results for the aggregate sectors (1<sup>st</sup> column) and 10 basic sectors (S0-S9). For the robustness checks we have also estimated the model using ICRG and WB corruption indexes (Table 7). The complete results of our estimations for CPI, CCI and ICRG indices together with used variables can be found in Appendix V.

We begin with the results of the CPI index in Table 6. The first important but unsurprising finding is that the aggregate exports hide significant variability in the sectoral results. Aggregate data do not suggest deep heterogeneity within EU while the preferences of the CEE and western countries should be similar (positive coefficient) and the coefficient in case of Mediterranean is insignificant. The sectoral data on the other side reveal severe heterogeneity not only across country groups but also across sectors. Therefore we leave the interpretation of the aggregate exports and focus directly on sectoral data.

**Table 6: Estimation results (CPI)**

		Agr.X	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
$\alpha_1$	CEE_CPI (importer)	+	-	-	+	-	-	-	+	+	+	-
$\alpha_3$	WEC_CPI (importer)	+	-	+	+	-	+	+	-	+	+	+
$\alpha_5$	MED_CPI (importer)		+	+		-	+	-	+		+	-
$\alpha_7$	REST_CPI (importer)	-	-	-	+	+	-	-	-			+

Starting with comparing results for country groups (hypothesis 1) we must conclude that we cannot observe opposite preferences between WEC states on one side and MED and CEE countries on the other side as expected in hypothesis 1. On the other hand, there are four sectors where the preferences of WED countries are opposite to preferences of CEE states ( $\alpha_1 < 0$  and  $\alpha_3 > 0$ ). This situation of preference heterogeneity between the western and eastern part of the EU holds for “Beverages and tobacco” (S1), “Animal oil, fat, wax” (S4), “chemicals” (S5) and category S9 grouping all other codes not included in S0-S8. Within these four sectors we can expect high motivation of CEE exporters to form interest groups and to influence their domestic politicians to not to enforce the act or even vote against those policies also on international level.

When we focus on MED countries then there are also four sectors with opposite preferences. In two of those sectors (S0 and S6) exporters from MED countries would support the policy and WEC exporters would oppose it ( $\alpha_3 < 0$  and  $\alpha_5 > 0$ ). In two others (S5 and S9) the situation is the opposite ( $\alpha_3 > 0$  and  $\alpha_5 < 0$ ).

Hence there are differences between western and MED and CEE countries but we cannot find any situation which would fit to the hypothesis 1 because of the differences between CEE and MED (the preferences are different in 6 out of 10 sectors). It implies that each country group behaves uniquely and we should always look at a country group pair. Most interesting difference is in case of CEE-WEC pair. Central and Eastern European exporters have in 40 % of sectors opposite preferences than their western partners. That may signal clash between these groups and are of strong anti-policy lobbying.

When we focus on sectors which have a potential of coalition formation then in case of CEE and WEC we can identify 5 sectors where the preferences (coefficient signs) are the same. In two cases the coalition would try to oppose the policy: S0 (food and live animals), and S3 (mineral fuels). On the other side sectors S2 (crude materials, fuel), S7 (machinery, transportation) and S8 (miscellaneous manufactured goods) should benefit from policy enforcement. In case of MED and WEC exporters the anti-policy coalition should be formed only in sector S3. Sectors S1 (beverages and tobacco), S4 (veg.oil, fat, wax) and S8 (misc. manufactured goods) should support the policy.

Surprisingly there are two sectors where the signs are exactly opposite compared to our expectations. WEC exporters would oppose the policy and MED or CEE exporters would support it. These are the S0 (food and live animals) and S6 (manufactured goods).

When we look at the signs across sectors we see significant heterogeneity. In other words aggregate data hides many aspects of our problem. There is no strong rule explaining the results. We can identify just two sectors where the preferences of all exporters across groups are the same: S3 (against policy) and S8 (in favour of the policy). Then there are two other sectors (S2 and S7) where the preferences are in favour of the policy for two country groups while for the third group the coefficient appeared to be insignificant. In all other sectors there are always pairs with opposite preferences.

The findings do not support claim that results are driven by sector type because just two sectors have same preferences across all exporters. Regarding the influence country origin we see that in each pair there are 4 (MED x WEC, CEE x MED) or 5 (CEE x WEC) sectors out of 10 with same preferences. CEE is the most interesting group for two reasons. At first there is the highest structural difference in the preferences compared to the WEC exporters - 4 sectors have opposite preferences opposing the policy (MED exporters only in 2 sectors). Secondly CEE countries have the highest number of sectors with negative preferences towards the policy: 6 compared to 4 (WEC) and 3 (MED). Interesting findings are also in the case of WEC exporters because we revealed 4 sectors opposing the policy which had been unexpected regarding the lowest corruption level across the groups. The results are in fact more country origin than sector driven (hypothesis 3) while 60 % of CEE, 70 % of WEC and 50 % of MED preferences are the same within group. So the country origin is better predictor of the preferences (coefficient signs) than sectors. In line with our expectations the WEC exporters are mainly supportive to the policy (70 % of sectors) while the CEE exporters are primarily against the policy (60 %). Surprising result is in case of Mediterranean exporters who are mainly in favour of the policy.

In the next step we run a robustness check when we estimated the model with ICRG and CCI indices. We have found few differences and several important similarities. Starting with the CCI (WB) index and the differences between it and CPI there are few sectors when the sign changes. S2 coefficient of WEC became negative and S6 coefficient of WEC became insignificant. On the other side the general distinction between Western and Eastern countries remains. 60 % of CEE sectoral coefficients is negative while in case of WEC it is just 30%. There are again four sectors where preferences of CEE exporters are negative towards the policy and preferences of WEC exporters are positive. The sectors with coalition potential remain the same. Similarly there are a few differences in case of MED exporters. Preferences of S2 became negative, S5 insignificant, S7 positive and S9 insignificant. However the general picture of MED group remains the same. MED exporters are still mainly proponents of the policy (60 % of sectors). Specific position of sectors S3 and S8 remained – both of them are areas of EU-wide exporters' coalition. Except from them also S7 follows the same pattern if the model is estimated on CCI data.

The "ICRG estimate" presents more different picture. Four WEC and MED and three CEE sectoral coefficients are insignificant. We can observe also significant changes in the sign of sectors S7 and S8. These coefficients in case of WEC became negative and in case of MED

insignificant. Sector S3 also lost its position while coefficients for two country groups became also insignificant. The high number of insignificant coefficients changes the picture while CEE exporters have more supportive preferences than negative and the WEC is in the opposite situation. However what makes the results with ICRG index relative is that the variable measures primarily political instability (Lambsdorff, 2007). This characteristic can be the source of quite different results compared to WB or CPI estimate.

**Table 7: Alternative corruption variables**

			Agr.X	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	No. Of obs.
FFC (CPI)	$\alpha_1$	CEE_CPI(importer)	+	-	-	+	-	-	-	+	+	+	-	295 352
	$\alpha_3$	WEC_CPI(importer)	+	-	+	+	-	+	+	-	+	+	+	
	$\alpha_5$	MED_CPI(importer)		+	+		-	+	-	+		+	-	
	$\alpha_7$	REST_CPI(importer)	-	-	-	+	+	-	-	-			+	
WB CCI	$\alpha_1$	CEE_CCI(importer)	+	-	-	+	-	-	-	+	+	+	-	235 072
	$\alpha_3$	WEC_CCI(importer)	+	-	+	-	-	+	+		+	+	+	
	$\alpha_5$	MED_CCI(importer)		+	+	-	-	+		+	+	+		
	$\alpha_7$	REST_CCI(importer)	+	-		+	+	+		-	+	+	+	
ICRG	$\alpha_1$	CEE_ICRG(importer)	+	-	-	+			-	+	+	+		295 352
	$\alpha_3$	WEC_ICRG(importer)	-	-		+		+		-	-	-		
	$\alpha_5$	MED_ICRG(importer)		+	+		-	+	+	+				
	$\alpha_7$	REST_ICRG (importer)	-	-	-		-	-	-	-	-	-		

## 5) Conclusion

We have tried to analyse the reasons behind the low enforcement of the OECD act using the policy preference mapping via gravity model. The idea is based on measurement of the correlation between export flows and corruption level of the importer. The correlation reveals how the export flows would react on the changes in corruption level of exporter's trading partners. For example, negative coefficient would tell us that the exports of country (or country group) A are stimulated by higher corruption of its partners. Therefore exporters of that country or country group would have motivation to oppose the efficient enforcement of the OECD act because orientation to less corrupt countries would harm export flows. This correlation analysis enables us to identify areas of potential interest groups formation (opposing or supporting the policy) for specific exporting sectors or country groups. Using this methodology we can then reveal policy preferences of the EU members towards the OECD act and analyse potential heterogeneity in the preferences between EU member states that would explain low enforcement of the act which is one of the main parts of the EU anti-corruption effort.

In the study we have analysed three hypotheses: CEE together with MED exporters have opposite preferences compared to WEC exporters; policy preferences vary between sectors; the primary driving force of the preferences is the country origin (whether exporter belongs e.g. to western or eastern Europe).

We have not found potential of a strong clash between these three blocks while MED exporters are mainly supportive to the policy. On the other hand there are visible structural differences between western and eastern EU members when the eastern countries are much more motivated to oppose the policy and to form strong interest groups. However, there are also few sectors with potential of EU wide coalition supporting the European anti-bribery policy. These are the crude materials (S2), manufactured goods (S8) and transportation sectors (S7). The results also suggest that sectors S0 (food and live animals), S5 (chemicals) and S9 (remaining category) are area of anti-policy coalition for two out of three country groups. Sector S3 (mineral fuels) could form an EU-wide coalition opposing the policy. The best predictor for preferences appeared to be country origin while country group always predicts at least 50 % of preferences.

The results reveal significant heterogeneity of preferences and identified not only areas of potential lobby clashes of export interest groups but also fields of coalition formation potential. That heterogeneity in preferences is likely another relevant source of low enforcement of the OECD anti-bribery act from the side of at least CEE EU members while this group has the highest anti-policy sectoral preferences. On the other side MED exporters should not have so strong motivation to sabotage EU-anticorruption effort in the sphere of international trade. We hence argue that the EU-anticorruption effort is undermined by underlying heterogeneity in sectoral preferences and any efficient enforcement should take diverging preferences into account, otherwise the "non-moderated" anti-policy lobby would try to sabotage successful enforcement of similar anti-corruption act.

The main methodological aim of the paper was to present a novel application of gravity models as a preference mapping tool. The paper contributes to the stream of literature associated with International Political Economy research and follows the aim of Pollins (1989) who called for bridging the gap between international economics and politics. IPE scholars usually enrich the gravity

equation to analyse effects of various political factors on trade (e.g. Early, 2012; Fuchs & Klann, 2013; Peterson, 2014; Peterson & Rudloff, 2015; Qureshi, 2013). Our application of the gravity model as a policy preference mapping tool is novel up to our knowledge. We diverge from standard application of gravity model in one significant aspect. While IPE or “trade” scholars use the model to investigate causal or quantitative effects of independent variable on dependent one (exports, imports or FDI), we shift our attention only to the sign of correlation. In other words we are not interested in the quantitative effects but only in the qualitative ones. The policy preference mapping based on gravity equation has several relevant advantages: easy data access, large data coverage, various policy application and examination of real behaviour of exporters (their trade flows) and avoidance of the biases of company questionnaires.

On the other hand, it should be repeated that this approach to policy preference mapping has several weaknesses because of the “birds’-eye view” perspective. In other words, we do not step into deep microeconomic explanation of exporters’ behavior or try to formulate causal claims. We believe that the policy preference analysis via gravity model is valuable tool providing us with a basic map of preferences. However it should be followed by case studies or other forms of “micro-focused” research if we are interested in the causality or concrete reasons behind exports’ behavior. Another practical limitation of the study is that the corruption level is measured via CPI index which measures primarily corruption perception. Even though we are trying to check for our results via another two indices (World Bank and ICRG) all three indicators do not directly and objectively measure corruption level. However, the robustness check does not distort the main picture even though several specific differences appear.

Taking into account these limitations we do not want to argue that preference divergence is the primary source of the low enforcement. We even do not investigate other sources of that. However, we believe that the results are strong enough to point to another significant contributing factor behind the weak enforcement of the act and that gravity models are useful tools in policy preference mapping.

## 6) Literature

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## Appendix I: PCA Analysis

Results for partner and exporter side are identical.

**Table 8: Overview of the components**

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	3.63	2.19	0.45	0.45
Comp2	1.44	0.6	0.18	0.63
Comp3	0.84	0.1	0.1	0.74
Comp4	0.74	0.24	0.09	0.83
Comp5	0.49	0.14	0.06	0.89
Comp6	0.35	0.07	0.04	0.94
Comp7	0.29	0.06	0.04	0.97
Comp8	0.23		0.03	1

**Table 9: Final PCA composition**

Variable	Comp1	Comp2
Property rights	0.46	-0.07
Fiscal freedom	-0.1	0.72
Government spending	-0.24	0.61
Business freedom	0.43	0.1
Monetary freedom	0.27	0.23
Trade freedom	0.3	0.09
Investment freedom	0.43	0.09
Financial freedom	0.44	0.18

## Appendix II: Country List

United Arab Emirates	Cabo Verde	Croatia	Mali	Singapore
Argentina	Costa Rica	Haiti	Malta	El Salvador
Armenia	Cuba	Hungary	Myanmar	Suriname
Australia	Cyprus	Indonesia	Mongolia	Slovakia
Austria	Czech Republic	India	Mozambique	Slovenia
Azerbaijan	Germany	Ireland	Mauritania	Sweden
Belgium	Denmark	Iran	Malawi	Swaziland
Benin	Dominican Republic	Israel	Malaysia	Syrian Arab Republic
Burkina Faso	Algeria	Italy	Niger	Thailand
Bangladesh	Ecuador	Jamaica	Nigeria	Trinidad and Tobago
Bulgaria	Egypt	Jordan	Nicaragua	Tunisia
Bahrain	Spain	Japan	Netherlands	Turkey
Bahamas	Estonia	Kenya	Norway	Tanzania
Belarus	Ethiopia	Republic of Korea	Nepal	Uganda
Belize	Finland	Kuwait	New Zealand	Ukraine
Bolivia	Fiji	Laos	Oman	Uruguay
Brazil	France	Lebanon	Pakistan	USA
Barbados	Gabon	Libya	Panama	Venezuela
Botswana	United Kingdom	Sri Lanka	Peru	Viet Nam
Canada	Georgia	Lesotho	Philippines	Yemen
Switzerland	Ghana	Lithuania	Poland	South Africa
Chile	Guinea	Luxembourg	Portugal	Zambia
China	Greece	Latvia	Paraguay	Zimbabwe
Cote d'Ivoire	Guatemala	Morocco	Romania	
Cameroon	Guyana	Moldova	Russian Federation	
Congo	Hong Kong	Madagascar	Saudi Arabia	
Colombia	Honduras	Mexico	Senegal	

## Appendix III: SITC Codes

Aggregate group	Aggregated codes
0	Food & live animals
1	Beverages and tobacco
2	Crude mater.ex food/fuel
3	Mineral fuel/lubricants
4	Animal/veg oil/fat/wax
5	Chemicals/products n.e.s
6	Manufactured goods
7	Machinery/transp equipmt
8	Miscellaneous manuf arts
9	Commodities nes

## Appendix IV: Variable list

Variable	Characteristics and Notes	Source
Exports	SITC 3 <sup>rd</sup> revision, In thousands USD	WITS
GDP of exporting country	GDP (current US\$)	WDI WB
GDP of destination country	GDP (current US\$)	WDI WB
Distance	Adjusted distance between economic centres. In km.	CEPII
RTA	Regional trade agreements	de Sousa (2012)
Business freedom	Value btw. 0 (worst) and 100 (best)	Heritage Foundations
Trade freedom	Value btw. 0 (worst) and 100 (best)	Heritage Foundations
Fiscal freedom	Value btw. 0 (worst) and 100 (best)	Heritage Foundations
Government spending	Value btw. 0 (worst) and 100 (best)	Heritage Foundations
Monetary freedom	Value btw. 0 (worst) and 100 (best)	Heritage Foundations
Investment freedom	Value btw. 0 (worst) and 100 (best)	Heritage Foundations
Financial freedom	Value btw. 0 (worst) and 100 (best)	Heritage Foundations
Property rights	Value btw. 0 (worst) and 100 (best)	Heritage Foundations
Freedom from Corruption	Value btw. 0 (worst) and 100 (best)	Heritage Foundations
Control of corruption index	Value btw. 0 (worst) and 100 (best)	World bank
International country risk guide – corruption index	For robustness checks, Value btw. 0 (worst) and 6 (best)	epub.prsgroup.com
Common official language	Dummy (0;1)	CEPII
landlocked	Dummy (0;1)	CEPII
colonial link	Dummy (0;1)	CEPII
Contiguity	Dummy (0;1)	CEPII
Same country before	Dummy (0;1)	CEPII

## Appendix V: Regression Results for WEC, MED and CEE

- A) Freedom from Corruption (Heritage Foundations, CPI)
- B) Control of Corruption (World Bank)
- C) ICRG corruption index (PRS Group)

Table 10: Regression variables

	Variable	Description		Variable	Description
Shared variables across all specifications	Inhdpdestination	Importer GDP in log	CCI specification	rCEE_pcci	CCI corr. variable for CEE (importer)
	Inhdpreporter	Exporter GDP in log		rCEE_rcci	CCI corr. variable for CEE (exporter)
	dist	Distance (taylor approx.)		rWEC2_pcci	CCI corr. variable for WEC (importer)
	ppc1	PCA - importer side (taylor approx.)		rWEC2_rcci	CCI corr. variable for WEC (exporter)
	ppc2	PCA - importer side (taylor approx.)		rMED2_pcci	CCI corr. variable for MED (importer)
	rpc1	PCA - exporter side (taylor approx.)		rMED2_rcci	CCI corr. variable for MED (exporter)
	rpc2	PCA - exporter side (taylor approx.)		REST_pcci	CCI corr. variable for others (importer)
	plandlocked	Landlocked (importer)		REST_rcci	CCI corr. variable for others (exporter)
	rlandlocked	Landlocked (exporter)	ICRG specification	rCEE_picrg	ICRG corr. variable for CEE (importer)
	contig	Contiguity (taylor approx.)		rCEE_ricrg	ICRG corr. variable for CEE (exporter)
	comlang_off	Common official lang. (taylor approx.)		rWEC2_picrg	ICRG corr. variable for WEC (importer)
	colony	Colonial link (taylor approx.)		rWEC2_ricrg	ICRG corr. variable for WEC (exporter)
	smctry	Same country before (taylor approx.)		rMED2_picrg	ICRG corr. variable for MED (importer)
	rta	Regional trade ag. (taylor approx.)		rMED2_ricrg	ICRG corr. variable for MED (exporter)
CPI (FFC) specification	rCEE_pffc	CPI (FFC) corr. variable for CEE (importer)		REST_picrg	ICRG corr. variable for others (importer)
	rCEE_rffc	CPI (FFC) corr. variable for CEE (exporter)		REST_ricrg	ICRG corr. variable for others (exporter)
	rWEC2_pffc	CPI (FFC) corr. variable for WEC (importer)			
	rWEC2_rffc	CPI (FFC) corr. variable for WEC (exporter)			
	rMED2_pffc	CPI (FFC) corr. variable for MED (importer)			
	rMED2_rffc	CPI (FFC) corr. variable for MED (exporter)			
	REST_pffc	CPI (FFC) corr. variable for others (importer)			
	REST_rffc	CPI (FFC) corr. variable for others (exporter)			

VARIABLES	(1) Total trade	(2) S0	(3) S1	(4) S2	(5) S3	(6) S4	(7) S5	(8) S6	(9) S7	(10) S8	(11) S9
lnhdpdestination	0.706*** (0.00764)	0.625*** (0.00643)	0.678*** (0.00961)	0.822*** (0.0208)	0.739*** (0.0125)	0.613*** (0.0174)	0.698*** (0.00783)	0.665*** (0.00700)	0.725*** (0.0112)	0.758*** (0.0141)	0.648*** (0.0158)
lnhdpreporter	0.736*** (0.00782)	0.553*** (0.00645)	0.636*** (0.00868)	0.619*** (0.0125)	0.527*** (0.0120)	0.589*** (0.00931)	0.741*** (0.00767)	0.716*** (0.00710)	0.847*** (0.0115)	0.797*** (0.0151)	0.776*** (0.0130)
dist	-0.673*** (0.0228)	-0.615*** (0.0192)	-0.580*** (0.0257)	-0.494*** (0.0358)	-1.067*** (0.0331)	-0.612*** (0.0317)	-0.835*** (0.0212)	-0.710*** (0.0204)	-0.591*** (0.0327)	-0.547*** (0.0377)	-0.510*** (0.0453)
ppc1	-4.673*** (0.991)	3.095*** (0.781)	15.52*** (1.228)	10.73*** (2.137)	-20.36*** (1.843)	-25.85*** (1.722)	20.31*** (0.956)	-13.19*** (0.878)	-2.185 (1.444)	-23.03*** (1.768)	30.17*** (2.931)
ppc2	-6.064*** (1.135)	-13.36*** (1.099)	-18.56*** (1.995)	1.585 (2.002)	4.141 (3.469)	33.95*** (2.612)	-5.866*** (1.624)	-25.22*** (1.051)	-3.688** (1.773)	-0.395 (1.607)	10.57*** (2.718)
rpc1	11.21*** (1.558)	12.43*** (1.451)	30.96*** (2.197)	-40.81*** (4.413)	17.79*** (3.222)	-16.61*** (3.300)	17.84*** (1.662)	12.39*** (1.538)	11.28*** (2.207)	22.39*** (2.603)	-7.451* (4.082)
rpc2	8.586*** (1.377)	-4.504*** (1.117)	8.237*** (1.766)	-5.379*** (1.465)	2.542 (3.201)	-16.20*** (2.423)	-7.110*** (1.304)	5.582*** (1.301)	21.65*** (1.829)	11.81*** (1.977)	14.36*** (3.762)
plandlocked	-0.469 (3.614)	-99.01*** (8.300)	-2.437 (5.516)	-62.41*** (5.695)	-145.7*** (10.50)	-160.5*** (8.600)	32.82*** (5.484)	23.58*** (4.151)	28.56*** (5.188)	46.17*** (6.076)	-47.06*** (7.031)
rlandlocked	-17.67*** (4.873)	-68.37*** (4.477)	-49.79*** (4.809)	-5.372 (7.840)	-37.92*** (8.244)	-128.8*** (7.212)	-25.32*** (4.407)	-17.20*** (5.088)	-30.08*** (6.396)	2.933 (6.296)	113.2*** (13.94)
contig	0.346*** (0.0423)	0.727*** (0.0391)	0.273*** (0.0639)	0.575*** (0.0588)	0.230*** (0.0770)	0.169* (0.0869)	0.128*** (0.0353)	0.390*** (0.0364)	0.311*** (0.0654)	0.491*** (0.0609)	0.399*** (0.0945)
comlang_off	0.206*** (0.0330)	0.0246 (0.0316)	0.135** (0.0543)	-0.0871 (0.0603)	0.157** (0.0701)	0.458*** (0.119)	0.431*** (0.0416)	0.299*** (0.0317)	0.125** (0.0523)	0.391*** (0.0378)	-0.0445 (0.0985)
colony	0.121*** (0.0335)	0.249*** (0.0408)	0.397*** (0.0597)	0.346*** (0.0453)	-0.0438 (0.0873)	0.439*** (0.115)	0.103*** (0.0381)	0.299*** (0.0351)	-0.0267 (0.0376)	0.0543 (0.0416)	0.921*** (0.147)
smctry	0.726*** (0.104)	0.403*** (0.0581)	0.855*** (0.0748)	0.366*** (0.128)	0.0502 (0.130)	-0.0687 (0.146)	0.193*** (0.0580)	0.427*** (0.0794)	1.122*** (0.144)	1.037*** (0.135)	0.186 (0.175)
rta	0.392*** (0.0358)	0.527*** (0.0302)	0.584*** (0.0464)	0.392*** (0.0571)	0.187*** (0.0583)	0.781*** (0.107)	0.133*** (0.0422)	0.523*** (0.0340)	0.533*** (0.0513)	0.270*** (0.0567)	0.628*** (0.106)
rCEE_pffc	0.00492*** (0.00156)	-0.00922*** (0.00165)	-0.0208*** (0.00239)	0.0253*** (0.00277)	-0.0187*** (0.00283)	-0.0130*** (0.00266)	-0.0229*** (0.00169)	0.00620*** (0.00157)	0.0188*** (0.00197)	0.00986*** (0.00203)	-0.0174*** (0.00267)
rCEE_rffc	1.977*** (0.186)	2.816*** (0.179)	2.913*** (0.309)	3.621*** (0.285)	3.141*** (0.251)	4.492*** (0.273)	2.777*** (0.153)	2.475*** (0.200)	1.518*** (0.207)	1.511*** (0.252)	1.458*** (0.304)
rWEC_pffc	0.00332*** (0.00104)	-0.00803*** (0.00107)	0.0110*** (0.00152)	0.00852*** (0.00210)	-0.00106 (0.00247)	0.00607** (0.00281)	0.00315*** (0.00115)	-0.00405*** (0.00107)	0.00452*** (0.00138)	0.00779*** (0.00161)	0.0196*** (0.00429)
rWEC_rffc	-0.0686 (0.0615)	0.652*** (0.0716)	-0.717*** (0.0787)	0.980*** (0.109)	-0.269* (0.161)	1.615*** (0.146)	-0.667*** (0.0723)	0.0947 (0.0633)	-0.0996 (0.0815)	0.107 (0.0888)	0.508** (0.250)
rMED_pffc	-0.000865 (0.00116)	0.00315** (0.00123)	0.0127*** (0.00159)	0.00140 (0.00239)	-0.0273*** (0.00243)	0.0257*** (0.00250)	-0.00655*** (0.00124)	0.00303** (0.00123)	-0.00136 (0.00154)	0.0119*** (0.00174)	-0.000718 (0.00330)
rMED_rffc	0.729*** (0.115)	1.344*** (0.125)	-0.0399 (0.185)	1.669*** (0.144)	0.907*** (0.275)	3.161*** (0.296)	0.508*** (0.112)	1.106*** (0.108)	0.489*** (0.133)	1.063*** (0.197)	1.611*** (0.185)
REST_pffc	-0.0142*** (0.00480)	-0.0337*** (0.00461)	-0.0812*** (0.00674)	0.0680*** (0.00904)	0.0222* (0.0114)	-0.0385*** (0.00952)	-0.0851*** (0.00515)	-0.0369*** (0.00453)	-0.00910 (0.00606)	-0.0101 (0.00656)	0.0719*** (0.0108)
REST_rffc	0.0341** (0.0158)	0.114*** (0.0179)	-0.0261 (0.0259)	-0.116*** (0.0384)	-1.016*** (0.195)	0.245*** (0.0358)	-0.00407 (0.0167)	0.107*** (0.0158)	0.0471** (0.0205)	0.0953*** (0.0270)	-0.0179 (0.0548)
Constant	-8.306*** (0.326)	-9.653*** (0.317)	-17.51*** (0.495)	-17.20*** (0.741)	-23.81*** (1.751)	-15.92*** (0.648)	-17.00*** (0.372)	-12.14*** (0.286)	-20.93*** (0.457)	-20.20*** (0.544)	-22.18*** (0.979)
Observations	295,352	295,352	295,352	295,352	295,352	295,352	295,352	295,352	295,352	295,352	295,352

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

VARIABLES	(1) Total trade	(2) S0	(3) S1	(4) S2	(5) S3	(6) S4	(7) S5	(8) S6	(9) S7	(10) S8	(11) S9
lnhdpdestination	0.713*** (0.00801)	0.622*** (0.00675)	0.679*** (0.0104)	0.871*** (0.0251)	0.737*** (0.0128)	0.631*** (0.0189)	0.701*** (0.00833)	0.666*** (0.00738)	0.730*** (0.0117)	0.764*** (0.0143)	0.656*** (0.0176)
lnhdpreporter	0.740*** (0.00878)	0.556*** (0.00702)	0.626*** (0.00925)	0.640*** (0.0135)	0.540*** (0.0130)	0.586*** (0.0102)	0.737*** (0.00863)	0.719*** (0.00798)	0.849*** (0.0129)	0.809*** (0.0167)	0.791*** (0.0141)
dist	-0.689*** (0.0249)	-0.611*** (0.0210)	-0.589*** (0.0287)	-0.498*** (0.0390)	-1.051*** (0.0350)	-0.661*** (0.0341)	-0.822*** (0.0227)	-0.709*** (0.0224)	-0.615*** (0.0360)	-0.574*** (0.0406)	-0.552*** (0.0484)
ppc1	-5.757*** (1.040)	3.104*** (0.839)	15.37*** (1.318)	10.23*** (2.276)	-22.86*** (1.818)	-27.54*** (1.875)	19.92*** (1.047)	-13.68*** (0.925)	-3.700** (1.493)	-24.38*** (1.794)	29.92*** (3.072)
ppc2	-7.091*** (1.316)	-16.83*** (1.180)	-23.62*** (2.259)	8.045*** (2.395)	9.355*** (3.510)	30.92*** (3.074)	-5.633*** (1.810)	-27.02*** (1.199)	-6.031*** (2.098)	-5.370*** (1.782)	16.87*** (3.099)
rpc1	6.628*** (1.546)	11.13*** (1.487)	19.68*** (2.225)	-26.96*** (4.221)	16.23*** (2.962)	-21.47*** (3.101)	8.807*** (1.560)	8.588*** (1.535)	5.593** (2.216)	15.21*** (2.738)	-6.113 (3.796)
rpc2	11.39*** (1.721)	-5.587*** (1.413)	11.67*** (2.327)	-2.131 (1.955)	3.044 (3.271)	-7.226** (3.101)	-4.392*** (1.642)	3.790** (1.609)	24.09*** (2.334)	14.32*** (2.428)	15.90*** (4.860)
plandlocked	-0.216 (3.949)	-95.81*** (4.165)	-1.734 (5.977)	-64.69*** (6.172)	-139.9*** (11.09)	-162.9*** (9.477)	28.00*** (5.835)	23.72*** (4.532)	30.76*** (5.667)	50.26*** (6.739)	-51.66*** (7.708)
rlandlocked	-18.92*** (5.454)	-66.33*** (4.908)	-57.05*** (5.624)	7.640 (9.282)	-34.96*** (8.607)	-129.5*** (8.146)	-29.68*** (4.965)	-16.56*** (5.651)	-33.23*** (7.270)	-1.580 (6.960)	114.4*** (14.45)
contig	0.339*** (0.0463)	0.750*** (0.0430)	0.308*** (0.0705)	0.549*** (0.0627)	0.248*** (0.0818)	0.170* (0.0920)	0.175*** (0.0386)	0.405*** (0.0392)	0.291*** (0.0737)	0.458*** (0.0654)	0.332*** (0.102)
comlang_off	0.203*** (0.0369)	0.0286 (0.0348)	0.120* (0.0615)	-0.0491 (0.0656)	0.176** (0.0738)	0.450*** (0.130)	0.439*** (0.0456)	0.293*** (0.0351)	0.115* (0.0596)	0.368*** (0.0423)	-0.0463 (0.108)
colony	0.112*** (0.0361)	0.231*** (0.0454)	0.387*** (0.0656)	0.336*** (0.0474)	-0.00140 (0.0914)	0.311** (0.123)	0.0404 (0.0411)	0.286*** (0.0386)	-0.0456 (0.0411)	0.0316 (0.0458)	0.933*** (0.160)
smctry	0.704*** (0.113)	0.386*** (0.0620)	0.840*** (0.0822)	0.275* (0.142)	0.0217 (0.137)	-0.178 (0.162)	0.141** (0.0702)	0.389*** (0.0859)	1.130*** (0.153)	1.023*** (0.141)	0.222 (0.184)
rta	0.419*** (0.0374)	0.569*** (0.0331)	0.663*** (0.0485)	0.420*** (0.0616)	0.206*** (0.0614)	0.885*** (0.110)	0.226*** (0.0441)	0.545*** (0.0362)	0.534*** (0.0539)	0.283*** (0.0580)	0.607*** (0.114)
rCEE_pcci	0.173*** (0.0353)	-0.185*** (0.0372)	-0.298*** (0.0533)	0.270*** (0.0557)	-0.483*** (0.0509)	-0.214*** (0.0591)	-0.382*** (0.0357)	0.184*** (0.0368)	0.507*** (0.0450)	0.337*** (0.0477)	-0.352*** (0.0524)
rCEE_rcci	167.4*** (15.10)	218.4*** (13.29)	255.9*** (18.27)	313.8*** (18.96)	254.8*** (18.30)	297.9*** (20.77)	251.3*** (12.31)	198.7*** (15.36)	100.4*** (20.85)	138.2*** (20.67)	153.6*** (29.06)
rWEC_pcci	0.175*** (0.0239)	-0.147*** (0.0247)	0.433*** (0.0365)	-0.116** (0.0449)	-0.144** (0.0599)	0.317*** (0.0624)	0.227*** (0.0261)	0.0305 (0.0248)	0.227*** (0.0323)	0.343*** (0.0370)	0.471*** (0.103)
rWEC_rcci	-9.336*** (3.088)	26.24*** (3.330)	-43.04*** (3.891)	60.37*** (5.669)	4.768 (6.567)	55.80*** (6.065)	-35.52*** (3.414)	-6.571** (3.303)	-14.41*** (4.158)	-8.410** (4.051)	14.27 (11.87)
rMED_pcci	0.0422 (0.0271)	0.104*** (0.0296)	0.440*** (0.0382)	-0.200*** (0.0503)	-0.618*** (0.0469)	0.645*** (0.0571)	-0.0242 (0.0267)	0.116*** (0.0304)	0.0640* (0.0360)	0.334*** (0.0419)	0.0263 (0.0702)
rMED_rcci	66.48*** (5.205)	60.77*** (9.667)	17.72 (11.77)	117.1*** (10.56)	89.59*** (14.91)	138.2*** (17.33)	53.24*** (4.546)	81.60*** (5.420)	49.40*** (5.939)	99.76*** (7.022)	99.54*** (12.36)
REST_pcci	0.463*** (0.143)	-0.646*** (0.136)	0.0861 (0.196)	0.663*** (0.249)	1.541*** (0.355)	1.362*** (0.372)	-0.173 (0.142)	-0.495*** (0.144)	0.496** (0.207)	0.567** (0.240)	1.664*** (0.296)
REST_rcci	-17.41*** (3.427)	-0.183 (3.566)	-34.00*** (4.868)	-29.15*** (5.714)	-47.75*** (8.838)	-67.40*** (9.236)	-38.51*** (4.028)	-1.617 (3.704)	-11.15** (4.819)	-9.151* (5.419)	-11.16 (7.462)
Constant	-8.246*** (0.229)	-12.76*** (0.196)	-17.35*** (0.282)	-19.31*** (0.602)	-14.92*** (0.355)	-16.06*** (0.461)	-17.52*** (0.213)	-15.54*** (0.209)	-18.62*** (0.346)	-19.48*** (0.479)	-19.22*** (0.458)
Observations	235,072	235,072	235,072	235,072	235,072	235,072	235,072	235,072	235,072	235,072	235,072

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



VARIABLES	(1) Total trade	(2) S0	(3) S1	(4) S2	(5) S3	(6) S4	(7) S5	(8) S6	(9) S7	(10) S8	(11) S9
Inhddestination	0.704*** (0.00718)	0.620*** (0.00658)	0.677*** (0.00925)	0.835*** (0.0228)	0.710*** (0.0129)	0.607*** (0.0178)	0.682*** (0.00741)	0.662*** (0.00669)	0.726*** (0.0107)	0.756*** (0.0133)	0.651*** (0.0162)
Inhdpreporter	0.746*** (0.00825)	0.544*** (0.00670)	0.661*** (0.00938)	0.577*** (0.0122)	0.500*** (0.0125)	0.577*** (0.0105)	0.755*** (0.00801)	0.721*** (0.00746)	0.884*** (0.0122)	0.818*** (0.0160)	0.783*** (0.0140)
dist	-0.679*** (0.0219)	-0.625*** (0.0189)	-0.595*** (0.0246)	-0.509*** (0.0348)	-1.027*** (0.0306)	-0.627*** (0.0317)	-0.822*** (0.0212)	-0.710*** (0.0199)	-0.606*** (0.0310)	-0.563*** (0.0361)	-0.544*** (0.0431)
ppc1	-9.408*** (1.090)	3.022*** (0.938)	2.640* (1.372)	20.16*** (2.567)	-15.41*** (2.060)	-28.90*** (2.061)	12.47*** (0.988)	-18.02*** (1.005)	-10.68*** (1.486)	-31.12*** (1.900)	27.72*** (2.974)
ppc2	6.514*** (1.301)	-11.79*** (1.304)	6.153*** (2.095)	-21.38*** (2.565)	-5.039 (3.910)	41.50*** (3.256)	10.25*** (2.016)	-12.41*** (1.273)	20.14*** (2.042)	21.03*** (1.794)	17.14*** (3.435)
rpc1	13.34*** (1.188)	14.43*** (1.076)	28.22*** (1.696)	-25.82*** (3.025)	25.20*** (2.386)	-17.44*** (2.738)	10.70*** (1.225)	11.12*** (1.184)	13.02*** (1.685)	26.74*** (1.999)	11.65*** (3.192)
rpc2	7.568*** (1.359)	-7.319*** (1.081)	8.219*** (1.764)	-8.012*** (1.307)	-9.358*** (2.293)	-18.99*** (1.331)	-7.512*** (1.294)	5.373*** (1.278)	21.53*** (1.778)	9.749*** (1.923)	11.04*** (4.053)
plandlocked	5.455 (3.660)	-94.26*** (4.014)	3.350 (5.671)	-61.39*** (5.848)	-131.3*** (10.53)	-144.2*** (8.909)	41.51*** (5.753)	30.55*** (4.185)	36.13*** (5.109)	54.32*** (6.319)	-44.09*** (7.438)
rlandlocked	-18.04*** (4.772)	-65.61*** (4.616)	-49.12*** (4.910)	8.700 (8.689)	-31.05*** (8.281)	-120.4*** (7.437)	-24.59*** (4.311)	-16.25*** (5.009)	-33.72*** (6.241)	-0.902 (6.021)	114.8*** (14.80)
contig	0.370*** (0.0402)	0.743*** (0.0383)	0.305*** (0.0602)	0.564*** (0.0589)	0.256*** (0.0779)	0.184** (0.0880)	0.175*** (0.0364)	0.414*** (0.0355)	0.349*** (0.0607)	0.514*** (0.0571)	0.377*** (0.0908)
comlang_off	0.217*** (0.0321)	0.00646 (0.0319)	0.141*** (0.0526)	-0.0777 (0.0559)	0.129 (0.0695)	0.416*** (0.119)	0.013*** (0.0425)	0.294*** (0.0317)	0.154*** (0.0500)	0.422*** (0.0371)	0.0128 (0.0946)
colony	0.135*** (0.0316)	0.237*** (0.0409)	0.409*** (0.0557)	0.273*** (0.0456)	-0.0589 (0.0950)	0.432*** (0.115)	0.159*** (0.0366)	0.320*** (0.0331)	-0.00615 (0.0350)	0.0471 (0.0394)	0.869*** (0.143)
smctry	0.671*** (0.100)	0.407*** (0.0602)	0.861*** (0.0718)	0.409*** (0.118)	0.0866 (0.130)	-0.0945 (0.146)	0.187*** (0.0600)	0.400*** (0.0778)	1.013*** (0.134)	0.923*** (0.130)	0.109 (0.176)
rta	0.393*** (0.0350)	0.515*** (0.0301)	0.549*** (0.0452)	0.323*** (0.0597)	0.149*** (0.0576)	0.770*** (0.108)	0.144*** (0.0415)	0.532*** (0.0339)	0.526*** (0.0489)	0.263*** (0.0548)	0.619*** (0.105)
rCEE_picrg	0.128*** (0.0284)	-0.133*** (0.0332)	-0.369*** (0.0504)	0.510*** (0.0419)	-0.0209 (0.0432)	-0.0697 (0.0725)	-0.214*** (0.0314)	0.108*** (0.0293)	0.240*** (0.0351)	0.158*** (0.0341)	-0.0765 (0.0610)
rCEE_ricrg	19.19*** (1.746)	26.32*** (1.843)	22.23*** (3.127)	23.43*** (2.302)	26.86*** (4.684)	99.96*** (3.756)	25.73*** (2.066)	18.87*** (1.753)	7.780*** (2.417)	28.35*** (2.705)	79.67*** (4.892)
rWEC_picrg	-0.0462*** (0.0140)	-0.160*** (0.0175)	0.00125 (0.0227)	0.136*** (0.0284)	0.0564 (0.0378)	0.0856* (0.0503)	0.00288 (0.0166)	-0.128*** (0.0152)	-0.0578*** (0.0186)	-0.0676*** (0.0208)	0.0969 (0.0597)
rWEC_ricrg	-3.554*** (0.693)	6.763*** (0.863)	-11.17*** (1.011)	13.59*** (1.386)	-3.220 (1.997)	20.67*** (1.936)	-10.01*** (0.874)	1.453* (0.764)	-5.160*** (0.946)	-1.645 (1.057)	0.242 (3.217)
rMED_picrg	0.00373 (0.0194)	0.0896*** (0.0229)	0.209*** (0.0252)	0.0369 (0.0349)	-0.349*** (0.0482)	0.218*** (0.0435)	0.0560*** (0.0200)	0.0529** (0.0226)	-0.0290 (0.0251)	0.0139 (0.0299)	-0.0728 (0.0620)
rMED_ricrg	16.60*** (1.472)	25.02*** (1.777)	2.126 (2.167)	46.92*** (2.343)	10.29* (5.476)	32.94*** (3.580)	15.72*** (1.423)	14.13*** (1.653)	15.30*** (1.973)	7.247** (2.820)	51.28*** (4.000)
REST_picrg	-0.444*** (0.0786)	-0.932*** (0.0715)	-1.013*** (0.125)	-0.128 (0.0984)	-0.504*** (0.149)	-0.670*** (0.148)	-1.088*** (0.0861)	-0.676*** (0.0749)	-0.250** (0.103)	-0.382*** (0.109)	-0.0242 (0.160)
REST_ricrg	2.810*** (0.220)	2.695*** (0.209)	6.190*** (0.282)	-3.018*** (0.376)	-5.384*** (0.705)	7.707*** (0.547)	3.382*** (0.266)	3.973*** (0.213)	4.454*** (0.299)	5.653*** (0.379)	1.427** (0.684)
Constant	-16.71*** (0.361)	-9.670*** (0.309)	-19.77*** (0.497)	-13.54*** (0.740)	-12.87*** (0.740)	-16.55*** (0.682)	-17.93*** (0.379)	-13.81*** (0.305)	-24.47*** (0.517)	-22.95*** (0.573)	-23.16*** (0.985)
Observations	248,536	248,536	248,536	248,536	248,536	248,536	248,536	248,536	248,536	248,536	248,536

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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