Corruption and the Level of Trade Protectionism

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1. Introduction[1]

The impact of corruption on different aspects of economics has been studied widely in the literature. Corruption is one of the institutional qualities that have a negative effect on economic measures like growth and trade. Policy makers in corrupted governments and societies do not maximize total national welfare of the economy. In fact, they are selling their beneficial power to enhance the opportunities for special interest groups who are lobbying, in order to stay longer in power.

In this paper, I am using corruption as a measure of authorities' misuse of power for special interest groups, which leads to the government's policies alterations and can affect trade patterns of a country. The main hypothesis of this paper is that a higher level of corruption causes higher levels of trade protection. Similar studies have been done previously over other samples of data. Bandyopadhyay and Roy [2006] analyzed this effect for 88 countries over the period 1982–97. In this paper, I am presenting a relatively similar analysis over a more recent period. There are some differences between this paper and previous studies. Firstly, I am analyzing various models whose dependent variables are different from each other. Secondly, in this paper I want to figure out that which trade subgroup is mostly affected by corruption. In other words, I will check impacts of corruption on some import subgroups and conclude that some of them are more affected by corruption, which shows higher benefits of those types of imports for the special interest groups who are lobbying with corrupted governments. I will also address heterogeneity and endogeneity problems of regression and will provide a suitable approach in order to control them.

The rest of the paper is organized as follows: section 2 presents literature review. In section 3, hypotheses of the paper and the expected impacts of variables are elaborated. I specify the estimation in section 4. In section 5,

[1] With special thanks to Professor Jan Jakub Michałek for his comments and supports.

data specifications are presented. in section 6 I will discuss the results of the estimations and finally propose some conclusions in section 7.

2. Literature Review

The role of corruption on poor economic conditions has been studied widely in the literature. Dietz et al. [2007] analyzed the popular topic of the effects of institutional qualities on positive genuine saving (GS), which is a necessary condition for sustainable development. In fact, according to definitions, GS is a net saving rate in a national accounting framework encompassing resources depletion and environmental degradation. In their analysis, they have found that low corruption has a positive impact on genuine saving in interaction with resource abundance of countries. Corruption is an important factor in the alteration of both political and economic decision-making. While this institutional quality does not affect the growth of the economy directly, high levels of corruption lead to some biased and wrong decisions of officials in the governments that do not maximize national welfare of the society and finally, due to creating disorders in the economy, they lead to a lower growth.

Grossman and Helpman [1994] have constructed a model that shows that special interest groups seek for government's choice of trade policy by making political contributions. Politicians maximize their welfare that is strongly affected by the contributions they have received. Therefore, policies are influenced by the different lobbies that construct a protection for the government's voters and those special interest groups. In this manner, the fundamental role of the government that takes care of its own society will be bounded to some special limited groups of people.

Some researchers studied the effect of corruption on different aspects of economy and found endogeneity of corruption in their models. Brunnschweiler and Bulte [2007] have proved that resource abundance has a positive impact on growth and a negative impact on institutional qualities, which means resource abundance countries, can have higher rates of corruption. Besides that, high level of institutional quality has a positive impact on growth which both lead to endogeneity of corruption and other institutional qualities. In order to solve the endogeneity problem they used the 3SLS estimation method.

Dutt and Traca [2008] claimed that corruption could have two different effects on trade relating the level of protectionism. If the level of protectionism, taxes, and duties on trade are not high, corruption leads to extortion. This means that corrupt customs officials extort bribes from exporters and importers, which results in a lower level of trade (the extortion effect). Nevertheless, if we confront a very high tariff environment, the corrupt officials allow exporters and importers to avoid tariff barriers (the evasion effect). These findings suggested that in the empirical analysis of corruption and trade, causality of the variables should be carefully considered, as it might

cause endogeneity of corruption in the regression. Gatti [2004] studied whether barriers on international trade and capital flows are directly related to the higher level of corruption. He found evidence that collusive behavior between individuals and customs officials is the main reasons of corruption and incentives of corruption are not mainly those of trade restrictions.

Treisman [2000] analyzed several measures of perceived corruption and found out that some of the more developed countries with Protestant traditions, a history of British rule, and higher imports were less corrupted. His findings were useful for other scholars like Bandyopadhyay and Roy [2006] in finding good instruments of corruption in their empirical analyses. They studied the effects of corruption on trade. Their analysis focused on the impact of corruption on three different measures of import duty, trade tax, and total trade-GDP ratio in a simple gravity model. The analysis covered over 88 countries in a panel data over the period of 1982–1997. They controlled for unobserved heterogeneity among countries applying the Fixed Effect estimator. In addition, they used instrumental variable regression to control for the endogenous characteristics of corruption in their analysis. Eventually, they proved that corruption has a significant positive impact on protectionism and trade barriers, and has significant negative effect on trade openness.

Thede and Gustafson [2009] in a working paper studied multifaceted corruption impact on trade on a cross section estimation for 1999. The five different characteristics of corruption they analyzed were level, prevalence, customs location, function, and predictability of corruption. In corruption-augmented gravity equation, which was estimated by the Heckman version of a GMM instrumental variable method, they found evidence that these characteristics of corruption have a significant negative influence on bilateral trade. The literature on the issue is so abundant and previous studies are so numerous, that it would verge on the impossible to discuss all of them in this paper.

3. General Hypotheses of the paper

I am analyzing the impact of corruption on different dependent variables. Firstly, I will investigate this effect on two models with protectionism measures as dependent variable. "Customs and other import duties" holds one of the protectionism measures, and "taxes on international trade" is the other one. According to the World Development Indicators definitions, the first one is defined as

> **customs and other import duties are all levies collected on goods that are entering the country or services delivered by nonresidents to residents. They include levies imposed for revenue or protection purposes and determined on a specific or *ad valorem* basis as long as they are restricted to imported goods or services[2].**

[2] http://data.worldbank.org/indicator/GC.TAX.IMPT.CN

While the latter is described as follows:

> **Taxes on international trade include import duties, export duties, profits of export or import monopolies, exchange profits, and exchange taxes[3].**

Secondly, I will analyze the impact of corruption on trade openness measures, which are "total trade GDP ratio," "total imports," "goods imports," and "services imports" on four different models. Finally, I will estimate certain models whose dependent variables are different types of import subgroups to check which types of import are highly affected by corruption. This shows the beneficial aspects of those types of imports for special interest groups who are lobbying with corrupted government. Note that the selection of these import subgroups is mainly based on the availability of data. Six subgroups of imports are as follows: "computer and communications services", "food," "fuel," "information and communication technology goods (ICT)," "manufactures," and "ores and metals."

According to the existing literature, corruption is expected to increase the level of trade protectionism, and decrease the level of imports and in general trade openness. However, since higher corruption in a given country is represented by a lower value of corruption in the data, negative signs of coefficients are expected for trade protectionism models, and positive signs for trade openness and imports.

I am using some of the factors that were used previously in different studies as control variables. Real GDP per capita, real GDP, government expenditure, current account balance, and WTO membership are the control variables, which have different impacts on the dependent variable.

Countries with a higher real GDP per capita that are more developed, can afford policies that are more liberal. In other words, developing countries with a lower GDP per capita may impose higher level of tariffs and duties in order to protect domestic market and industries. GDP is a proxy for country size that can show the measure of market size in a country. Hence, a country with a higher GDP is willing to trade more. However, another hypothesis can be put forward, namely that bigger countries avoid openness of trade since they can supply their own domestic markets. Nevertheless, these two opposite hypotheses can be tested in the regressions.

Some authors claim that government expenditure has a positive relation with international trade, as does Rodrik [1998]. He has explained that, when the terms-of-trade risk is very high, government spending reduces the risk of exposure to international trade by the inclusion of some effective controls. Therefore, in line with his analysis, there is a positive correlation between openness and the government size. Meanwhile, we can assume that countries

[3] http://data.worldbank.org/indicator/GC.TAX.INTT.CN

with bigger governments might be less liberal, and consequently impose higher trade barriers. However, we can only provide conclusions as to the exact impact after obtaining the results of regressions.

Governments with higher current account deficits seem to impose higher trade tariffs and taxations on imports in order to generate revenues. However, they might impose export taxes when they encounter surplus. Therefore, current account balances seem to have a negative impact on import protectionism and a positive impact on imports, while the impact on total trade and taxes is unknown. On the other hand, current account balances are mainly the results of imports and exports. When the imports are increasing, current account balances decrease. This reverse causality will bring us closer to conclusions after the estimations have been done.

Members of World Trade Organization (WTO) have regulatory limitations in imposition of protection on imports. Hence, countries that became members of the WTO may impose high tariffs and taxes on trade less frequently. Given these hypotheses, I expect coefficient results for variables that are indicated in table 1.

Table 1.

Expected signs of coefficients according to hypotheses

Variable	Duties on import	Taxes on trade	Trade-GDP ratio	Other imports
Corruption	Negative	Negative	Positive	Positive
Real GDP	Unknown	Unknown	Unknown	Unknown
Government Expenditure	Unknown	Unknown	Unknown	Unknown
Current account balance	Unknown	Unknown	Unknown	Unknown
GDP per capita	Negative	Negative	Positive	Positive
WTO Membership	Negative	Negative	Positive	Positive

Note: Corruption is expected to increase trade protectionism and decrease the level of trade. However, signs of corruption coefficients in models are expected as in the table, because corruption indices show higher corruption with lower values. The next section describes the corruption indices.

4. Estimation specification

Since this study is based on panel data, OLS regression seems to be inconsistent as we might have country specifics and time fixed effects (FE). I control for fixed effects of time and country specifics in the regressions using fixed effect estimators. However, in this study, I apply the Haussmann test to check for significance of random effects (RE) in each equation; thus, some

equations are estimated via random effect estimator instead of fixed effects. A general model can be constructed as follows:

$$Y_{it} = \beta_0 + \beta_1 corruption + X_{it}\beta_2 + \gamma_t + \varphi_i + e_{it} \quad (1)$$

Y_{it} is the dependent variable for country i at time t, which will be different in the models of estimation. In fact, I estimate 12 equations whose dependent variables are different. β_0 is the constant term, X_{it} is a vector of control variables, γ_t indicates time specific effects and φ_i indicates country specific effects, and e_{it} is a vector of error terms.

In the simplest model, equation (1) is estimated using FE and RE estimators that can control for time and country specific effects. In order to control for the existing heteroskedasticity in the regressions, robust estimators are used.

As it was mentioned earlier, different studies observed endogeneity of corruption in trade and economic models [Treisman, 2000; Bandyopadhyay and Roy, 2006; Brunnschweiler and Bulte, 2007]. When there is an improvement of institutional qualities, there must be less bureaucracy in countries, which will increase the level of trade and decrease the level of corruption. Moreover, other explanatory variables in the model can also have endogeneity and reverse causalities with the dependent variables. Current account balance is highly affected by the trade flows, which seem to be the result rather than the cause of the dependent variables. Also, even though high government expenditures can stabilize the risk of trade by implementing various trade controls, they can be highly affected by the revenues gained on trade.

To reduce the endogeneity bias in the estimations one can use instrumental variables. According to Hausman tests, using FE and RE estimator with instruments for corruption was not consistent in comparison with FE and RE estimators without any instruments. Moreover, for complete control over the model various instruments are needed for each independent variable. Thus, I have used system GMM to achieve the most consistent unbiased outcomes. An augmented version of difference GMM proposed by Arellano and Bover [1995], which is an improved version of GMM proposed by Arellano-Bond [1991]. This augmented version was developed by Blundell and Bond [1998] and it is a system GMM that has a two-step standard error correction mechanism. This estimator provided by Roodman [2006] in Stata is suitable for panel datasets with short periods and many groups that contain fixed effects and heteroskedastic idiosyncratic errors, which are similar to the data presented in this paper. Lags of levels and lags of differences of variables are used in differenced and level versions of the system GMM such that the outcome is highly consistent and unbiased. The estimations are compatible with estimation tests as shown in tables 2.c and 3.c.

In addition to the lags and differences of variables, some instruments are included in the GMM estimation. OECD countries that are more developed have some anti-corruption legislation; therefore, they seem to be less corrupted. It was mentioned in the literature that countries with British colonial heritage are less corrupted. However, I add colonial heritage of some other developed countries that have significant correlation with corruption. It means that the countries with a colonial past are less corrupted. Colonies of the United States of America, the United Kingdom, France, Germany, Belgium, Portugal, Spain, and the Netherlands are included in one variable as an instrument. In the literature, countries with Protestant regulations have been proved to be less corrupted. However, there has been no official data for this variable. Year dummies are also included in the instrument covariates to decrease the heterogeneity problem in the data.

5. Data Specification

This analysis is over an unbalanced panel data consisting of around 200 countries in the period of 1996–2011. The main independent variable in this study has been obtained from two different sources. One is Control of Corruption (CC) from the Worldwide Governance Indicator (WGI) published on the World Bank website[4], which is defined as

> **perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests[5].**

In this dataset, lower scores of index, which can be also negative, shows the higher level of corruption. For example, in 2011, Somalia had the highest corruption with the score of –1.72 and Denmark had the lowest level of corruption with the score of 2.42. This indicator includes indexes of 212 countries in the period of 1996–2011 but it does not include any data for any country for the years1997, 1999, and 2001.

The second source of data for corruption is the Corruption Perceptions Index (CPI) of the Transparency International website[6], which provides data similar to the previous one but includes the indexes for about 182 countries in the period between 1998 and 2011. This index, just like the previous one, has been compiled from different surveys carried out by various organizations, but it is only positive. Similarly, the score with lower value shows higher level of corruption. For example, in 2011, Somalia and North Korea had the highest corruption with the score of "1" and New Zealand had the

[4] This data is available at: http://info.worldbank.org/governance/wgi/index.asp
[5] http://info.worldbank.org/governance/wgi/faq.htm
[6] This data is available at: http://transparency.org/policy_research/surveys_indices/cpi

lowest level of corruption with the score of 9.5. There is a significant positive correlation between variables in both sources.

The WTO variable is a dummy variable that gets the value of "1" if at the time "t" the country is a member of WTO and gets the value of "0" if at that time the country is not a member. This data was taken from the WTO website[7]. For corruption instruments, OECD is a dummy variable that gets the value of "1" if the country is an OECD member and gets the value of "0" if it is not[8]. The colonies variable is constructed in a way that receives the value of "1; 0.75; 0.5 and 0" respectively if the country is currently a colony, was a colony after 1945, had been a colony before 1945, and has never been a colony of the above mentioned countries. Giving a unique value to all colonies make them exactly similar to each other; while some countries with a long history of independency, like Egypt, do not have anything in common with Britain right now. Data on colonial heritage was compiled from the CEPII database[9] and was completed for those missing in CEPII data by own research.

The data for all other variables in the model are taken from the World Development Indicators (WDI) of the World Bank[10]. Dependent variables, current account balance, and general government final consumption expenditure variables are all described as percentages to GDP. If the raw data was not in terms of percentages of GDP, own calculations were done considering current and constant prices, local currency, and US Dollar units of both variables and GDP. Total GDP and GDP per capita that were in US Dollar units are logged in the estimations. Dummy variables and corruption indices are in the regressions as explained above without any changes.

6. Results

Two categories will be estimated, one with the CPI and the other with CC from WGI. In each of them, I will estimate 12 equations in two parts using two different estimation methods as explained before.

6.1. CPI category

6.1.1. Regression using FE and RE estimators

Table 2.a shows estimation results of the CPI category using FE and RE estimators. The Hausman test for consistency of FE suggests that the first column should be estimated using RE and the rest of the equations should be estimated using FE estimators. R-squared and Adjusted R-squared are very

[7] This data is available at: http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm

[8] This data is available at: http://www.oecd.org/general/listofoecdmembercountries-ratificationoftheconventionontheoecd.htm

[9] This data is available at: http://www.cepii.com/anglaisgraph/bdd/distances.htm

[10] This data is available at: http://data.worldbank.org/data-catalog/world-development-indicators

Table 2.a.

FE and RE estimation of CPI

	Customs and Import Duties	Tax on Trade	Trade-GDP ratio	Total Im.	Goods Im.	Services Im.	Computer Ser. Im.	Food Im.	Fuel Im.	ICT Goods Im.	Manufacture Im.	Metal Im.
CPI	*–0.00085*	–0.0037***	2.25*	0.013*	0.014**	–0.0050	–0.12	0.069	0.11	0.44*	1.36**	0.058
	(0.00082)	(0.0013)	(1.32)	(0.0066)	(0.0058)	(0.0059)	(0.22)	(0.10)	(0.29)	(0.25)	(0.66)	(0.053)
log of GDP per cap.	*–0.0021*	0.053***	–2.58	–0.034	0.027	0.031	13.8	–0.99	–4.70	7.11*	7.75	0.36
	(0.0022)	(0.017)	(15.2)	(0.082)	(0.080)	(0.052)	(8.82)	(1.58)	(5.07)	(4.07)	(7.46)	(0.88)
Gov. Exp.	*0.00081***	0.00038	–0.80**	–0.0019	–0.0013	0.00089	0.28	0.033	–0.072	–0.12**	–0.33**	–0.014
	(0.00031)	(0.00027)	(0.36)	(0.0016)	(0.0021)	(0.0012)	(0.20)	(0.029)	(0.073)	(0.053)	(0.16)	(0.013)
log of GDP	*–0.0063***	–0.049***	20.0	0.11*	0.076	–0.038	–9.82	1.25	9.67**	–5.50	–0.025	0.70
	(0.0018)	(0.012)	(12.4)	(0.063)	(0.067)	(0.051)	(8.57)	(1.16)	(4.25)	(3.51)	(5.81)	(0.65)
Cur. Acc.	*0.000084*	0.000049	0.020	–0.0037***	–0.0043***	–0.0009***	0.018	–0.035***	–0.058*	–0.029**	–0.27***	–0.0033
	(0.000096)	(0.00011)	(0.14)	(0.00095)	(0.00066)	(0.00034)	(0.12)	(0.0079)	(0.033)	(0.014)	(0.050)	(0.0086)
WTO mem.	*–0.0023*	–0.0075***	9.89*	0.067**	0.045	0.0098	–0.97	0.33	–0.54	0.22	3.10	0.23
	(0.0030)	(0.0021)	(5.22)	(0.028)	(0.027)	(0.0092)	(0.62)	(0.52)	(0.89)	(0.66)	(2.02)	(0.21)
Constant	*0.18***	0.79***	–380.7*	–1.93*	–1.79	0.77	128.9	–19.5	–191.6***	79.9	–40.4	–19.3**
	(0.038)	(0.17)	(199.1)	(0.99)	(1.08)	(0.85)	(141.0)	(16.2)	(65.1)	(55.6)	(90.3)	(9.51)
Observations	*900*	960	1599	1599	1606	1606	638	1467	1466	1219	1467	1467
R^2		0.108	0.099	0.148	0.195	0.028	0.075	0.058	0.184	0.033	0.136	0.149
Adjusted R^2		0.102	0.096	0.145	0.192	0.024	0.066	0.054	0.181	0.028	0.132	0.145
Hausman test Prob > chi2	*0.1098*	0.0000	0.0000	0.0000	0.0000	0.0018	0.0001	0.0000	0.0000	0.0004	0.0000	0.0000
Breusch Pagan Test Prob > chibar2	*0.0000*											
Wald Test of FE Prob > chi2		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Column in italic estimated with RE estimator due to the Hausman consistency test.
Due to statistics of Wald test for Heteroskedasticity in FE estimators, robust estimators were estimated for all models.

close to each other in all equations. However, they are very small and show the explanatory power of the independent variables.

Between two trade protectionism measures, only the second one shows a statistically significant negative coefficient for CPI. Corruption increases tax on trade as expected. CPI also gets expected significant positive signs for three of the openness measures. Corruption decreases trade GDP ratio, total imports, and goods imports. Among import subgroups, corruption decreases ICT goods and manufacture imports. These results conclude that CPI has a statistically significant impact on the imports of goods. Thus, tax on trade, total imports, and trade GDP ratio are mainly affected by corruption through imports of goods. It is observed that services imports and services import subgroups are not affected by corruption. Special interest groups are mainly interested in the import of goods and they put their efforts with the corrupted government to achieve their goals via these imports.

The GDP per capita coefficient is statistically significant only in two of the models. It shows positive impact on both taxes on trade and ICT goods imports. Developed countries with a higher GDP per capita seem to impose more taxes on trade, while they import higher levels of ICT goods. Government expenditure statistically significantly increases customs and import duties and decreases trade GDP ratio, ICT goods imports, and manufacturing goods imports. This is in opposition with one of the hypotheses that were mentioned earlier about this variable. However, if we think of the reverse causality of government expenditure and the dependent variables, these results seem to be appropriate. Thus, countries with bigger governments are less liberal in trade.

GDP coefficient is statistically significant for four models. GDP decreases trade protectionism measures, and increases total imports and fuel imports. It means that countries with bigger market and higher capacities put less restriction for trade. Big markets need big supply side or even more differentiated products from many suppliers. Moreover, bigger countries impose less tax on total trade, which can be also on exports. This can suggest that big domestic industries of such countries will be flown to foreign markets easily.

Current account balance shows statistically significant coefficients in seven equations. The results for this variable show again the reverse causality with the dependent variables. In other words, imports decrease current account balances effectively, while it can be incorrectly perceived in the table of estimations that this variable has a negative impact on imports. WTO coefficients show that being a WTO member would decrease taxes on trade and would increase trade GDP ratio and total imports for the members significantly, which seems in line with the hypotheses.

6.1.2. GMM regression

Table 2.b shows the estimation results of the system GMM over the data sample of CPI. Table 2.c represents the post estimation tests for autocor-

relation in differences, and Hansen over-identification tests for the instruments. According to these test statistics, best combinations of lags and lags of differences of variables were used for all models. Two lags of the dependent variable, all explanatory variables in levels, year dummies, and first lags of the explanatory variables except the WTO variable were included in each equation. As it was mentioned earlier, some instruments were also used as standard instruments of the regressions. Given Arellano-Bond Autoregressive tests approve the usage of differences and a lag of differences for all models. Instruments for total trade model are not exogenous in both GMM and IV equations according to the Difference-in-Hansen tests. In addition to that, these tests show similar issues for the GMM differences equations, and IV excluding groups in services import model. Other possibilities were checked for those models, but these combinations of variables are the most suitable ones. All other models have suitable test statistics of the post estimation.

As observed in table 2.b, the current value of CPI has a statistically significant coefficient only in the food import model. This shows that corruption decreases only the current level of food imports that seem to be very attractive to special interest groups lobbying with corrupted governments. However, the lag of this variable in this equation is negative, which might suggest that the previous level of corruption in a country might even increase the level of current food import. This result might lead to an interpretation that particular interest groups, especially in poor countries with a high level of corruption, try to change the pattern of trade in food according to their interests. The level of food import decreases and then, when they find a good chance to import, the food import in the following year (long run) will be increased through their channels. This can be a single factor interpretation, while other dependent variables, such as trade protectionism, are unaffected.

There are two other statistically significant coefficients for the lag of corruption in tax on trade and services imports models which are both positive. These two outcomes can be interpreted as a negative impact of past corruption on the current level of tax on trade and services imports. However, the p values of both coefficients are very close to a 10% level of significance, which might be negligible.

The log of GDP per capita has statistically significant positive coefficients for the two trade protectionism models and six other models. Thus, it means that more developed countries not only impose higher protectionism measures against trade, but also have more trade openness and imports. The lag of log of GDP per capita has very close coefficients to the current log of GDP per capita in all models, but with negative signs. Since this variable is in logs, the coefficients show impact on the dependent variables marginally. Because of the linear relation between them, the marginal effects are always similar but with reverse impacts, which prevents divergence of the model in the long run.

Table 2.b.

GMM regression of CPI

	Customs and Import Duties	Tax on Trade	Trade-GDP ratio	Total Im.	Goods Im.	Services Im.	Computer Ser. Im.	Food Im.	Fuel Im.	ICT Goods Im.	Manufacture Im.	Metal Im.
L. Dep. Var.	0.81***	0.73***	0.95***	0.91***	0.88***	0.91***	1.10***	0.68***	0.72***	1.00***	0.89***	0.81***
	(0.072)	(0.082)	(0.041)	(0.050)	(0.074)	(0.14)	(0.089)	(0.050)	(0.052)	(0.19)	(0.046)	(0.062)
L2. Dep. Var.	0.23**	0.29***	0.051	0.087*	0.13*	–0.042	–0.24***	0.17***	0.24***	0.020	0.11***	0.19***
	(0.094)	(0.097)	(0.041)	(0.046)	(0.073)	(0.098)	(0.070)	(0.049)	(0.075)	(0.17)	(0.036)	(0.057)
CPI	–0.0014	–0.0022	0.62	0.0026	–0.0046	–0.0054	–0.18	0.31**	0.060	0.15	–0.59	–0.039
	(0.0014)	(0.0014)	(1.41)	(0.0081)	(0.0064)	(0.0049)	(0.24)	(0.12)	(0.28)	(0.24)	(0.51)	(0.046)
L. CPI	0.0016	0.0023*	0.34	0.0024	0.0080	0.0088*	0.29	–0.26**	0.025	–0.18	0.81	0.069
	(0.0013)	(0.0014)	(1.31)	(0.0075)	(0.0063)	(0.0053)	(0.25)	(0.12)	(0.28)	(0.23)	(0.53)	(0.043)
log of GDP per cap.	0.054**	0.066*	136.3***	0.87***	0.49**	0.11	0.70	3.91	16.4*	15.5	53.2**	2.33**
	(0.027)	(0.034)	(35.1)	(0.22)	(0.22)	(0.13)	(8.35)	(4.13)	(9.54)	(11.3)	(21.3)	(1.10)
L. log of GDP per cap.	–0.055**	–0.067*	–136.5***	–0.87***	–0.49**	–0.10	–0.30	–3.87	–16.4*	–15.5	–53.4**	–2.40**
	(0.028)	(0.034)	(35.3)	(0.22)	(0.22)	(0.13)	(8.44)	(4.14)	(9.54)	(11.3)	(21.4)	(1.10)
log of GDP	–0.049	–0.060	–135.3***	–0.89***	–0.49**	–0.18	6.36	–8.18*	–24.7***	–15.1	–45.4**	–2.49**
	(0.030)	(0.038)	(38.4)	(0.25)	(0.21)	(0.14)	(11.1)	(4.18)	(9.17)	(11.2)	(20.7)	(1.19)
L. log of GDP	0.049	0.061	134.7***	0.89***	0.48**	0.18	–6.63	7.96*	24.6***	15.1	45.2**	2.50**
	(0.030)	(0.038)	(38.3)	(0.25)	(0.21)	(0.14)	(11.1)	(4.16)	(9.16)	(11.2)	(20.6)	(1.18)
Gov. Exp.	0.00081**	0.00031	–0.25	0.0015	–0.00030	0.0014	0.0090	0.013	0.080	0.0042	–0.14	–0.016
	(0.00039)	(0.00045)	(0.26)	(0.0018)	(0.0021)	(0.0012)	(0.057)	(0.052)	(0.075)	(0.028)	(0.19)	(0.014)
L. Gov. Exp.	–0.00067	–0.000033	0.0063	–0.0032	–0.0014	–0.0029*	–0.093	–0.035	–0.13*	–0.041	0.028	0.016
	(0.00044)	(0.00048)	(0.29)	(0.0021)	(0.0022)	(0.0016)	(0.069)	(0.052)	(0.079)	(0.031)	(0.20)	(0.014)
Cur. Acc.	0.00015	0.00013	–0.21**	–0.0046***	–0.0054***	–0.0016***	0.0082	–0.030***	–0.071***	–0.044***	–0.31***	–0.010***
	(0.00010)	(0.00013)	(0.10)	(0.00072)	(0.00088)	(0.00047)	(0.086)	(0.0086)	(0.024)	(0.015)	(0.033)	(0.0035)
L. Cur. Acc.	–0.000070	0.00000074	0.30***	0.0053***	0.0052***	0.0019***	–0.017	0.026***	0.075***	0.036***	0.34***	0.014***
	(0.000080)	(0.00012)	(0.11)	(0.00078)	(0.00068)	(0.00053)	(0.067)	(0.0093)	(0.028)	(0.0099)	(0.033)	(0.0039)
WTO mem.	0.00084	0.0011	–0.26	–0.00030	–0.0041	–0.012**	–0.87**	–0.30**	–0.32	0.074	–0.077	0.017
	(0.00099)	(0.0015)	(0.84)	(0.0049)	(0.0070)	(0.0056)	(0.39)	(0.15)	(0.25)	(0.12)	(0.40)	(0.034)

Table 2.b.

GMM regression of CPI (cont.)

	Customs and Import Duties	Tax on Trade	Trade-GDP ratio	Total Im.	Goods Im.	Services Im.	Computer Ser. Im.	Food Im.	Fuel Im.	ICT Goods Im.	Manufacture Im.	Metal Im.
yr 1999	–0.0024***	–0.0019**	–6.49***	–0.036***	–0.047***	–0.0056*	–0.0070	–0.73***	–1.65***		–1.71***	–0.32***
	(0.00091)	(0.00087)	(1.27)	(0.0069)	(0.0081)	(0.0029)	(0.13)	(0.12)	(0.25)		(0.55)	(0.084)
yr 2000	–0.0024***	–0.0021**	0.061	0.00075	–0.018**	0.0015	0.085	–0.46***	–0.16		0.15	–0.12
	(0.00086)	(0.00094)	(1.14)	(0.0063)	(0.0079)	(0.0026)	(0.16)	(0.11)	(0.24)		(0.45)	(0.084)
yr 2001	–0.0022**	–0.0024*	–8.03***	–0.040***	–0.051***	–0.0048*	0.19	–0.40***	–1.80***		–1.62***	–0.32***
	(0.00091)	(0.0013)	(1.07)	(0.0058)	(0.0079)	(0.0026)	(0.12)	(0.10)	(0.28)		(0.50)	(0.083)
yr 2002	–0.0033***	–0.0031**	–8.02***	–0.044***	–0.052***	–0.0062*	0.040	–0.47***	–2.13***	–0.58***	–1.74***	–0.33***
	(0.0011)	(0.0012)	(1.23)	(0.0069)	(0.0083)	(0.0034)	(0.21)	(0.095)	(0.28)	(0.18)	(0.54)	(0.084)
yr 2003	–0.0015	–0.0022*	–5.60***	–0.028***	–0.040***	–0.0075**	–0.060	–0.36***	–1.61***	–0.42***	–0.80*	–0.24***
	(0.0010)	(0.0011)	(1.13)	(0.0069)	(0.0080)	(0.0035)	(0.16)	(0.094)	(0.24)	(0.16)	(0.45)	(0.080)
yr 2004	–0.00032	–0.00040	–2.51**	–0.014**	–0.024***	0.0013		–0.26**	–0.82***	–0.15	0.11	–0.14*
	(0.00082)	(0.00085)	(1.03)	(0.0063)	(0.0074)	(0.0023)		(0.11)	(0.25)	(0.17)	(0.47)	(0.081)
yr 2005	–0.0020*	–0.00064	–4.43***	–0.020***	–0.027***	–0.0028		–0.41***	–0.28	–0.30	–1.01**	–0.19**
	(0.0011)	(0.0014)	(1.15)	(0.0063)	(0.0072)	(0.0020)		(0.090)	(0.26)	(0.23)	(0.45)	(0.080)
yr 2006	0.00052	–0.000057	–3.95***	–0.020***	–0.033***	–0.00094		–0.46***	–0.44*	–0.29	–1.44***	–0.024
	(0.0020)	(0.0019)	(1.07)	(0.0060)	(0.0079)	(0.0023)		(0.12)	(0.26)	(0.20)	(0.48)	(0.083)
yr 2007	–0.00091	–0.00057	–6.04***	–0.030***	–0.044***	–0.0024		–0.16*	–1.42***	–0.90***	–1.59***	–0.16**
	(0.00068)	(0.00090)	(1.08)	(0.0062)	(0.0088)	(0.0027)		(0.093)	(0.29)	(0.25)	(0.46)	(0.081)
yr 2008	–0.0014*	0.000040	–4.50***	–0.023***	–0.035***	–0.0032		–0.092	–0.67**	–0.79***	–1.82***	–0.19**
	(0.00078)	(0.0010)	(1.02)	(0.0053)	(0.0084)	(0.0021)		(0.079)	(0.29)	(0.23)	(0.44)	(0.089)
yr 2009	–0.0035***	–0.0029**	–18.1***	–0.098***	–0.10***	–0.013**		–0.66***	–3.89***	–0.87***	–4.62***	–0.64***
	(0.0012)	(0.0012)	(1.63)	(0.0095)	(0.011)	(0.0057)		(0.14)	(0.39)	(0.22)	(0.65)	(0.091)
yr 2010	–0.00067	–0.0014	–1.87	–0.015**	–0.024**	0.0014		–0.22***	–0.94**		–0.037	–0.084
	(0.00089)	(0.00089)	(1.27)	(0.0072)	(0.010)	(0.0020)		(0.062)	(0.37)		(0.48)	(0.093)
Constant	–0.0067*	–0.010**	23.9***	0.14***	0.11***	0.14***	5.08**	6.80***	6.30***	0.72	8.30***	0.40*
	(0.0036)	(0.0052)	(8.34)	(0.044)	(0.035)	(0.048)	(2.18)	(1.28)	(1.78)	(0.94)	(3.16)	(0.22)
Observations	706	778	1424	1424	1423	1423	497	1284	1281	975	1284	1284

Standard errors in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.c.

Tests of GMM regression of CPI

	Customs and Import Duties	Tax on Trade	Trade-GDP ratio	Total Im.	Goods Im.	Services Im.	Computer Ser. Im.	Food Im.	Fuel Im.	ICT Goods Im.	Manufactu re Im.	Metal Im.
Arellano-Bond AR(1) test in first differences Pr > z	0.078	0.004	0.000	0.000	0.001	0.000	0.010	0.000	0.001	0.062	0.000	0.000
Arellano-Bond AR(2) test in first differences Pr > z	0.293	0.211	0.104	0.101	0.648	0.387	0.195	0.221	0.342	0.229	0.569	0.718
Hansen overid. Test Prob > chi2	1.000	1.000	1.000	1.000	1.000	0.958	0.999	1.000	1.000	1.000	1.000	1.000
Difference-in-Hansen tests of exogeneity of Inst.												
GMM Inst.												
Excluding group	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.944	1.000	1.000	1.000	1.000
Difference	1.000	1.000	1.000	1.000	0.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000
IV Inst.												
Excluding group	1.000	1.000	1.000	1.000	1.000	0.000	0.994	1.000	1.000	1.000	1.000	1.000
Difference	1.000	0.999	1.000	0.000	1.000	1.000	1.000	0.999	1.000	1.000	1.000	0.552

A similar situation to the variable described above is observed for the log of GDP in all models. Except that this variable has no significant impact on trade protectionism models, and has a negative statistically significant impact on seven other models. Current values of GDP decrease trade openness and some imports, while the past values of it have the reverse impact with the same magnitudes.

Current value of government expenditure has statistically significant positive impact on only customs and import duties. Similarly to the results presented in table 2.a., this result also shows that countries with bigger government expenditures are less liberal and impose protectionism on trade to reduce trade openness and imports.

The current account balance variable has a significant negative impact on all dimensions of trade openness and imports, except for computer services imports. This result is similar to the outcomes shown in table 2.a. Even though the usage of first differences and instruments decrease the dual causalities of variables, it is observed that current account balances decrease the level of trade and imports. A country with a higher current account balances has excessive exports in the current period. It brings a situation in which next year imports increase and account balances decrease in the next period, since the lag of this variable has positive statistically significant coefficients.

WTO members seem to have less import of services, food, and computer services with respect to non-members according to the results of table 2.b, which is against the hypotheses.

6.2. CC Category

6.2.1. Regression using FE and RE estimators

Table 3.a shows estimation results of the CC category without application of instruments. The Hausman test proves that all equations should be estimated using FE estimators due to consistency and efficiency of the regressions. Robust estimators were estimated due to the existence of heteroskedasticity in error terms. R-squared and Adjusted R-squared has similar situations to the previously mentioned category. Corruption perceived as CC in this table decreases import of services and computer services significantly. The coefficient of this variable is not statistically significant for any other models.

Control variables have almost similar results and interpretations to the previous category estimated by FE and RE estimators. Statistically significant coefficients for log of GDP per capita show that more developed countries impose higher trade protectionism measures with respect to less developed countries. Besides, this variable increases computer services imports and decreases fuel imports significantly. Government expenditure increases the customs and import duties and food imports, and decreases the import of

Table 3.a.

FE and RE estimation of CC

	Customs and Import Duties	Tax on Trade	Trade-GDP ratio	Total Im.	Goods Im.	Services Im.	Computer Ser. Im.	Food Im.	Fuel Im.	ICT Goods Im.	Manufacture Im.	Metal Im.
CC	0.000008	0.0017	0.74	0.0027	0.00030	–0.0096*	–0.69*	–0.24	–0.69	0.92	1.62	–0.023
	(0.0021)	(0.0034)	(2.61)	(0.014)	(0.0076)	(0.0053)	(0.40)	(0.21)	(0.51)	(0.58)	(1.13)	(0.094)
log of GDP per cap.	0.018*	0.038**	–5.87	–0.048	–0.037	0.024	11.9***	–0.45	–6.10**	5.23	6.97	0.75
	(0.0095)	(0.017)	(11.2)	(0.066)	(0.031)	(0.032)	(3.70)	(1.39)	(2.58)	(3.29)	(5.56)	(0.54)
Gov. Exp.	0.0011***	0.00062	–0.50	–0.00067	–0.00049	0.00077	0.11	0.053*	–0.093	–0.083**	–0.038	–0.0056
	(0.00021)	(0.00092)	(0.35)	(0.0018)	(0.00068)	(0.0011)	(0.095)	(0.029)	(0.062)	(0.036)	(0.12)	(0.0071)
log of GDP	–0.025***	–0.035***	21.0**	0.11**	0.11***	–0.030	–7.33**	0.071	10.3***	–4.13	–0.45	0.16
	(0.0075)	(0.012)	(8.24)	(0.047)	(0.024)	(0.034)	(2.81)	(1.07)	(2.23)	(2.90)	(4.29)	(0.35)
Cur. Acc.	0.00014*	0.00018	0.069	–0.0035***	–0.0038***	–0.00052	–0.037	–0.036***	–0.075***	–0.029***	–0.24***	–0.0048
	(0.000077)	(0.00015)	(0.11)	(0.00072)	(0.00026)	(0.00041)	(0.046)	(0.0076)	(0.022)	(0.011)	(0.034)	(0.0056)
WTO mem.	–0.0024	–0.0059*	6.86*	0.049**	0.036***	0.014*	–0.79*	0.56	–0.46	0.45	3.70***	0.19
	(0.0025)	(0.0033)	(3.81)	(0.020)	(0.010)	(0.0080)	(0.46)	(0.36)	(0.70)	(0.41)	(1.30)	(0.14)
Constant	0.45***	0.55***	–358.3***	–1.76**	–1.89***	0.60	82.7*	5.30	–190.4***	61.1	–22.6	–8.96*
	(0.11)	(0.16)	(124.0)	(0.69)	(0.35)	(0.59)	(43.6)	(15.1)	(34.5)	(45.3)	(65.0)	(4.80)
Observations	980	1041	1878	1878	1885	1885	809	1646	1645	1319	1646	1646
R^2	0.075	0.045	0.089	0.128	0.168	0.014	0.079	0.047	0.183	0.029	0.115	0.118
Adjusted R^2	–0.066	0.040	0.086	0.125	0.085	0.010	0.072	0.043	0.180	0.025	0.112	0.115
Hausman test Prob > chi2	0.0021	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
Wald Test of FE Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Due to statistics of Wald test for Heteroskedasticity in FE estimators, robust estimators were estimated for all models.

ICT goods. In addition to similar results of log of GDP in this category with results of the CPI category, this variable increases trade GDP ratio and imports of goods, while it decreases the level of computer services imports. The coefficients of current account balances and WTO in this category are almost similar to the results of the CPI category and lend themselves to the same interpretations.

6.2.2. GMM regression

The specifications of the GMM regression of this category are chosen similarly to the CPI category. Table 3.b represents the outcomes of the GMM regressions of CC category and table 3.c shows their post-estimation tests. The latter suggests that the specifications and inclusion of instruments and lags for all models in the former table are appropriate. Except in the last column of table 3.b, all coefficients of corruption are statistically insignificant. What this result means is that corruption perceived by the WGI surveys increases the current level of metal imports, and decreases the next levels of this import subgroup. In other words, special interest groups are attracted to the import of metal and pursue a high level of metal imports for the current period. When they undertake imports through their own channels, in the next period the import of this product is decreased.

According to table 3.b, the following results are suggested while they have similar interpretations with the CPI category. Coefficients of log of GDP per capita are statistically significant in trade GDP ratio, total imports, fuel imports, and metal imports. Log of GDP has a statistically significant negative impact on total imports and fuel imports. Government expenditures increase customs and import duties significantly, while they decrease trade GDP ratio and metal imports. The current account balance variable has statistically significantly negative coefficients in the first protectionism measure. This variable has statistically significantly positive coefficients for all of trade openness and imports equations except for computer services imports. Being a WTO member does not statistically affect any of the dependent variables, except for a decrease in computer services imports.

7. Conclusion

In this paper, I have tried to study the impact of corruption on international trade and the level of trade protectionism. Two sets of data for corruption from two different sources were used. The impacts of corruption on two measures of trade protectionism, total trade, total imports, imports of goods, imports of services, and some subgroups of imports were analyzed. Because of endogeneity, country specifics effects, time fixed effects, and heteroskedasticity problems in the estimations, methods other than normal OLS were applied to achieve robust and consistent results. Fixed effect and random effect estimators were used in the first step neglecting the endogeneity

Table 3.b.

GMM regression of CC

	Customs and Import Duties	Tax on Trade	Trade-GDP ratio	Total Im.	Goods Im.	Services Im.	Computer Ser. Im.	Food Im.	Fuel Im.	ICT Goods Im.	Manufacture Im.	Metal Im.
L. Dep. Var.	0.85***	0.77***	0.96***	0.90***	0.92***	0.83***	0.54	0.68***	0.72***	1.01***	0.90***	0.80***
	(0.081)	(0.080)	(0.046)	(0.052)	(0.079)	(0.094)	(0.39)	(0.046)	(0.054)	(0.20)	(0.048)	(0.066)
L2. Dep. Var.	0.18*	0.26***	0.041	0.094**	0.091	0.080	0.070	0.16***	0.25***	0.012	0.10***	0.20***
	(0.10)	(0.088)	(0.045)	(0.046)	(0.076)	(0.086)	(0.25)	(0.054)	(0.077)	(0.17)	(0.037)	(0.061)
CC	–0.00016	0.0063	0.68	0.0076	–0.0025	0.027	2.16	0.093	–0.94	0.72	1.16	–0.18*
	(0.0021)	(0.0042)	(3.68)	(0.028)	(0.016)	(0.021)	(1.94)	(0.27)	(0.64)	(0.56)	(1.11)	(0.10)
L. CC	0.00076	–0.0056	–0.38	–0.0044	0.011	–0.023	0.46	–0.14	0.91	–0.72	–0.97	0.20**
	(0.0021)	(0.0038)	(3.76)	(0.029)	(0.015)	(0.021)	(1.10)	(0.26)	(0.63)	(0.50)	(1.18)	(0.10)
log of GDP per cap.	0.0057	0.012	60.6*	0.32*	0.36	0.076	61.5	1.01	16.1*	15.3	32.9	2.91*
	(0.024)	(0.042)	(35.7)	(0.19)	(0.23)	(0.15)	(59.9)	(4.83)	(9.05)	(12.3)	(21.3)	(1.71)
L. log of GDP per cap.	–0.0069	–0.013	–59.9*	–0.32*	–0.36	–0.072	–62.2	–0.86	–16.2*	–15.4	–32.8	–2.96*
	(0.024)	(0.042)	(35.9)	(0.19)	(0.23)	(0.15)	(60.6)	(4.87)	(9.02)	(12.3)	(21.4)	(1.72)
log of GDP	0.0032	–0.0053	–56.4	–0.33*	–0.33	–0.19	–53.3	–4.85	–25.0***	–14.4	–21.5	–2.67
	(0.024)	(0.039)	(38.5)	(0.20)	(0.23)	(0.20)	(58.7)	(5.08)	(8.72)	(11.6)	(21.5)	(1.72)
L. log of GDP	–0.0026	0.0057	56.2	0.33	0.33	0.18	52.9	4.62	25.0***	14.4	21.5	2.70
	(0.023)	(0.039)	(38.5)	(0.20)	(0.23)	(0.20)	(58.6)	(5.08)	(8.71)	(11.6)	(21.5)	(1.72)
Gov. Exp.	0.00083**	0.00023	–0.43*	–0.00031	–0.0013	–0.00057	–0.20	0.011	0.10	–0.033	–0.27	–0.026*
	(0.00038)	(0.00053)	(0.24)	(0.0017)	(0.0014)	(0.00053)	(0.22)	(0.051)	(0.087)	(0.040)	(0.16)	(0.014)
L. Gov. Exp.	–0.00057	0.00015	0.36	–0.00032	0.00032	–0.00088	–0.087	–0.028	–0.11	0.0080	0.20	0.025*
	(0.00050)	(0.00062)	(0.24)	(0.0016)	(0.0013)	(0.00057)	(0.17)	(0.045)	(0.082)	(0.041)	(0.17)	(0.014)
Cur. Acc.	0.00019*	0.00013	–0.25**	–0.0048***	–0.0053***	–0.0014***	0.065	–0.034***	–0.077***	–0.054***	–0.34***	–0.011***
	(0.00011)	(0.00016)	(0.11)	(0.00073)	(0.00079)	(0.00029)	(0.12)	(0.0084)	(0.026)	(0.016)	(0.037)	(0.0033)
L. Cur. Acc.	–0.000078	0.0000036	0.25**	0.0048***	0.0052***	0.0015***	–0.081	0.021***	0.081***	0.044***	0.31***	0.013***
	(0.000090)	(0.00015)	(0.11)	(0.00068)	(0.00077)	(0.00030)	(0.097)	(0.0077)	(0.030)	(0.011)	(0.035)	(0.0041)

Table 3.b.

GMM regression of CC (cont.)

	Customs and Import Duties	Tax on Trade	Trade-GDP ratio	Total Im.	Goods Im.	Services Im.	Computer Ser. Im.	Food Im.	Fuel Im.	ICT Goods Im.	Manufacture Im.	Metal Im.
WTO mem.	0.00082	0.00089	–0.21	–0.0011	–0.0056	–0.0064	–2.13*	–0.18	–0.11	–0.0065	–0.19	0.036
	(0.0010)	(0.0013)	(0.78)	(0.0051)	(0.0067)	(0.0043)	(1.09)	(0.15)	(0.20)	(0.12)	(0.31)	(0.033)
yr 2003	–0.0014	–0.0021*	–4.04***	–0.021***	–0.033***	–0.0035	–0.24	–0.48***	–1.39***	–0.32*	–0.69	–0.21***
	(0.00098)	(0.0013)	(1.02)	(0.0058)	(0.0077)	(0.0028)	(0.21)	(0.093)	(0.24)	(0.18)	(0.46)	(0.074)
yr 2004	–0.00052	0.00069	–1.87*	–0.0100*	–0.024***	0.0034		–0.23**	–0.88***	–0.18	–0.033	–0.14*
	(0.00099)	(0.0012)	(0.99)	(0.0060)	(0.0076)	(0.0024)		(0.096)	(0.25)	(0.18)	(0.48)	(0.074)
yr 2005	–0.0018	0.00037	–3.71***	–0.015**	–0.026***	0.00053		–0.39***	–0.28	–0.25	–0.87*	–0.18**
	(0.0012)	(0.0016)	(1.06)	(0.0062)	(0.0074)	(0.0024)		(0.083)	(0.26)	(0.21)	(0.45)	(0.076)
yr 2006	0.00075	0.00037	–3.04***	–0.012	–0.030***	0.0054		–0.42***	–0.41	–0.31	–1.38***	–0.023
	(0.0021)	(0.0021)	(1.11)	(0.0078)	(0.0071)	(0.0060)		(0.11)	(0.26)	(0.20)	(0.48)	(0.079)
yr 2007	–0.0014	–0.00032	–5.39***	–0.027***	–0.041***	–0.00061		–0.10	–1.47***	–0.82***	–1.39***	–0.16**
	(0.00088)	(0.00093)	(1.06)	(0.0057)	(0.0089)	(0.0021)		(0.087)	(0.28)	(0.23)	(0.46)	(0.077)
yr 2008	–0.0013	0.00062	–3.73***	–0.019***	–0.030***	–0.0017		–0.042	–0.61**	–0.74***	–1.66***	–0.18**
	(0.00083)	(0.0011)	(1.04)	(0.0054)	(0.0079)	(0.0018)		(0.080)	(0.28)	(0.22)	(0.45)	(0.084)
yr 2009	–0.0031***	–0.0018	–17.1***	–0.092***	–0.095***	–0.011*		–0.61***	–3.94***	–0.71***	–4.10***	–0.59***
	(0.0011)	(0.0013)	(1.61)	(0.0089)	(0.010)	(0.0061)		(0.14)	(0.35)	(0.19)	(0.62)	(0.085)
yr 2010	–0.00052	–0.00095	–1.22	–0.014**	–0.019*	0.00062		–0.19***	–0.97***		0.089	–0.087
	(0.00087)	(0.00088)	(1.33)	(0.0070)	(0.011)	(0.0019)		(0.060)	(0.37)		(0.49)	(0.093)
Constant	–0.0082	–0.0059	8.06	0.079**	0.11**	0.071***	21.2	5.78***	5.17***	–0.19	1.78	–0.058
	(0.0065)	(0.0080)	(7.49)	(0.040)	(0.048)	(0.027)	(14.1)	(1.34)	(1.59)	(1.29)	(3.41)	(0.31)
Observations	627	683	1282	1282	1278	1278	243	1099	1096	1006	1099	1099

Standard errors in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.c.

Tests of GMM regression of CC

	Customs and Import Duties	Tax on Trade	Trade-GDP ratio	Total Im.	Goods Im.	Services Im.	Computer Ser. Im.	Food Im.	Fuel Im.	ICT Goods Im.	Manufacture Im.	Metal Im.
Arellano-Bond AR(1) test in first differences Pr > z	0.082	0.079	0.000	0.006	0.000	0.058	0.000	0.000	0.001	0.059	0.000	0.000
Arellano-Bond AR(2) test in first differences Pr > z	0.986	0.609	0.249	0.318	0.389	0.262	.	0.631	0.192	0.242	0.620	0.643
Hansen overid. Test Prob > chi2	1.000	1.000	1.000	1.000	1.000	1.000	0.957	1.000	1.000	1.000	1.000	1.000
Difference-in-Hansen tests of exogeneity of Inst.												
GMM Inst.												
Excluding group	1.000	1.000	1.000	1.000	1.000	1.000	0.921	1.000	1.000	1.000	1.000	1.000
Difference	1.000	1.000	1.000	1.000	1.000	1.000	0.797	1.000	1.000	1.000	1.000	1.000
IV Inst.												
Excluding group	1.000	1.000	1.000	1.000	1.000	1.000	0.923	1.000	1.000	1.000	1.000	1.000
Difference	0.999	1.000	1.000	1.000	1.000	0.997	0.828	1.000	1.000	1.000	1.000	0.900

problems. In the second step, GMM was used to control for most of the regression problems. The endogeneity problem in the regressions of corruption seems to be very significant because of a huge difference between the outcomes of GMM and panel estimations of FE and RE. Therefore, the results of regressions with the usage of instrumental variables are preferred to the ones without instruments.

The results of GMM regressions of both categories of data show that corruption has no impact on trade protectionism. Corruption surveyed by the Transparency International website has a negative impact on current food imports. On the other hand, corruption measured by World Governance Indicators has a positive current effect on metal imports. Special interest groups are attracted to food according to CPI, and also to metal products according to CC.

Another interesting conclusion can be related to the trustworthiness of sources of corruption data. The data for corruption of the two sources has been compiled in surveys conducted by a number organizations globally. The most important outcome is that the estimation results over these two databases are not equivalent. This suggests mainly that corruption levels and rankings assigned to particular countries in the world have not been equivalently surveyed by the two sources. It can be even a matter of taste for those organizations measuring the data. Their accountabilities are not questioned with the results of this paper; nevertheless, they seem to observe corruption from different perspectives. Perhaps the aspects of WGI surveyors are different from those of Transparency International. Because of the differences in the results of the two sources, either both of the two sources are not showing the real levels of corruption or at least one of them is not. However, this paper is not aimed to judge the sources of corruption data, and the above observation is a result of a slight comparison of the two sources.

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Abstract **Corruption and the Level of Trade Protectionism**

In this paper, impacts of corruption on the level of trade protectionism, trade openness, and imports are analyzed. It is argued that special interest groups who are lobbying with corrupted governments might seek more benefits in some special subgroups of imports. Possible country and time specific fixed effects, endogeneity and some other problems in the regressions are controlled to achieve results that are more robust. Corruption measures from two different sources of Worldwide Governance Indicator and Transparency International website are analyzed in two separate similar approaches. It is finally concluded that both measures of corruption implicate negative influence on only one import subgroup, while there is no significant impact on protectionism measures.

Keywords: Corruption, Trade Policy, Protectionism
JEL Codes: F1, F13