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Empirical analysis of the impact of Turkish bilateral official development assistance on export

Arab Dahir Hassan[1*], Esra Dil[2]

[1]Ibnu Haldun University, Başakşehir, Turkey
[2]Sakarya University, Sakarya, Turkey
[*]Corresponding author: arab.hassan@ibnuhaldun.edu.tr

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Author's email:
esradil@sakarya.edu.tr

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Abstract

Purpose — The main objective of this study is to explore the relationship between bilateral official development assistance and the export of Turkey to 18 Turkish aid recipient countries between 1998 and 2019.

Methods — The study employs the gravity model of international trade to capture the effect of official development assistance on Turkish export to its aid recipient countries and utilizes Panel data econometric analysis.

Findings — The official development assistance (ODA) remains statistically significant across the models, indicating that ODA is one of the significant drivers of Turkish bilateral trade with the aid recipient countries.

Implications — The study argues that Turkey applied ODA as a foreign policy tool to access new markets in the Middle East, Balkans, Africa, and Asia. Turkish exports to developing countries increased due to the upsurged country's foreign aid donation to its recipients.

Originality — This study deviates from other studies in the literature by empirically examining the relationship between bilateral Official development assistance and the export of Turkey.

Keywords — Gravity model, official development assistance, export, Turkey.

Introduction

Developed countries frequently use foreign aid to further their foreign policy goals in developing and least-developed nations. Although each donor has a different foreign assistance policy, most give bilateral aid to nations with which they have colonial links, a common official language, and, most crucially, strong cultural and historical ties (Nilsson, 1998). Indisputably, economic and political interests have also shaped donors' foreign aid allocations. The strategic interests of a donor, such as security and political influence, also play a vital role in foreign aid allocations. These strategic interests are often associated with commercial objectives (Arvin & Baum, 1997).

Over the years, the relationship between foreign assistance and trade attracted substantial academic attention and has been studied in different dimensions and contexts. Generally, the existing literature highlights a positive association between foreign aid and trade; this association is robust to different restrictions in the case of donor exports but not recipient exports (Martínez-Zarzoso, Nowak-Lehmann, Parra, & Klasen, 2014; Martínez-Zarzoso, Nowak-Lehmann, & Klasen, 2017).

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Trade is impacted differently by various types of international aid. For instance, tied foreign aid has been perceived as a tool used by donors to increase their exports to aid recipient countries, whereas untied development aid, technical assistance, and humanitarian aid foster goodwill between donors and recipients, which in turn, spurs bilateral trade and investment. Generally, foreign aid can affect bilateral trade between donor and recipient through several channels. Firstly, donors can apply foreign assistance as a 'market entry policy' to create or fortify the official relationship and portray themselves as reliable donors. Secondly, a donor may provide aid for trade devoted to improving infrastructure, production capability, or easing bilateral trade. These methods decrease trade costs and boost bilateral trade. Thirdly, the idea that foreign assistance increases recipient countries' income and purchasing power raises the possibility that exports from donors to recipient countries will rise (Martinez-Zarzoso, 2019).

The paper investigates whether bilateral official development assistance encourages Turkey's export to aid recipients. Although Turkey is not a member of the DAC, it has been reporting to the OECD and providing official development assistance to developing countries since 1990. Over the past 20 years, Turkey's official development assistance has drastically expanded, from 85 million in 2002 to 8.121 billion in 2017. Moreover, according to Turkish Cooperation and Coordination Agency (TIKA), in 2015, Turkey was rated as the most generous country in the OECD. Similarly, according to the Global Humanitarian Report 2018, Turkey has the biggest expenditure on humanitarian aid, totaling $8.0 million.

Immense studies are devoted to the relationship between foreign aid and foreign trade in the literature (Martínez-Zarzoso, Nowak-Lehmann, Klasen, & Johannsen, 2016; Nowak-Lehmann, Martínez-Zarzoso, Herzer, Klasen, & Cardozo, 2013; Otor & Dornan, 2017; Skärvall, 2012). These studies examined the relationship between international trade and aid from various angles. The literature extensively discusses themes like donors providing foreign aid out of a sense of compassion to share their wealth with less fortunate countries (Gulrajani & Calleja, 2019). However, many empirical studies demonstrated that bilateral foreign aid had been applied to achieve foreign policy objectives; economic, trade, political, and strategic interest (Apodaca, 2017).

Different traditional and emerging donors have different foreign policy tools and endings; hence, they practice different foreign assistance compatible with their foreign policy. This heterogeneity among donors' political, economic, and strategic interests obstructs drawing clear distinctions between and within donors' foreign aid targets. For instance, according to Alesina and Dollar (2000), Norway and France have significant variations in their foreign aid motives. In contrast to France, Norway strongly emphasizes recipient needs such as income level, recipient merit, openness, and institution quality. Instead, France favors providing aid to its former colonies, regardless of how poor the destination country is.

Martinez-Zarzoso (2019) argues that foreign assistance can promote exports from donor countries to recipient countries at the bilateral level in several ways. Firstly, donors can implement foreign assistance as a policy instrument for exploring new trade partners to create or strengthen official relations and to improve the country's international image by representing themselves as a trustworthy and humanistic donor. Secondly, a donor country may offer foreign assistance for trade purposes devoted to improving trade infrastructure, and it may minimize trade costs and enhance exports. Thirdly, assuming foreign assistance stimulates trade, it increases demand for imported products from donors.

Arvin and Baum (1997) developed a foreign assistance model and endeavored to explain how different forms of foreign aid enhance donor's export to recipient countries. The study analyzed a sample of seventeen OECD countries from 1972-1990. It shed light on donors persistently offering substantial untied foreign aid to create a stock of goodwill, improving their export to aid recipient countries. Donors usually politicize the development of foreign assistance, particularly tied aid to accomplish their political, strategic, and economic interests. Bilateral official development assistance (ODA) has been employed to boost the export volume to aid recipient countries. It is where the two broad concepts of foreign aid and trade intersect. Hence, Inmaculada Martínez-Zarzoso et al. (2014), using advanced panel data methods, examined whether bilateral aid was effective in fostering bilateral exports to recipient countries during 1988–2007 and to what

degree adjustments in aid policies have influenced this relationship. The findings indicated that donors' bilateral foreign assistance has positively affected their exports to developing states. The study also highlighted the effects of bilateral foreign assistance on export changes over time and across donors. Martínez-Zarzoso et al. (2017), using a dynamic gravity model, also estimated the impact of Dutch development aid on the aggregate export of Dutch in different periods across aid recipient nations. The findings revealed that $1 of development aid expenditure created a range of returns from $0.26 to $0.40 from 1964 to 1999. The study's estimates also revealed that aid is not statistically significant across periods and countries.

Martínez-Zarzoso, Nowak-Lehmann, and Klasen (2010), using the gravity model of international trade, investigated how multilateral and bilateral foreign aid affects donor's exports to recipient states and compared estimates across donors. The results indicated an overall positive relationship between multilateral aid and exports of all donors. Notably, findings also revealed that a multilateral form of foreign aid only positively affects export in the short run. However, bilateral foreign aid has a positive effect on export both in the short & long term.

Noh and Heshmati (2017) examined the link between Korean bilateral official development assistance (ODA) and its export to aid recipient countries from 1996 to 2014. Using the traditional gravity model, the results disclosed that humanitarian assistance and loan forms of ODA positively affect export. Likewise, Martínez-Zarzoso et al. (2016) applied an augmented gravity trade model to explore the linkage between German development assistance and sectoral-level exports from Germany to aid recipient countries with data from 1978–2011. The results suggested that in the long run, each dollar of German foreign aid leads to an average upsurge of $ 0.83 in German goods exports. On the other hand, Skärvall (2012) endeavored to investigate the association between bilateral trade and official development assistance (ODA) and the aid for trade (AFT) of Sweden. The study used a gravity model of international trade to analyze data which comprises 126 aid recipient countries from 1996 to 2009. The estimates indicated that bilateral trade between Sweden and its aid recipients improves as the official development assistance increases. In contrast, Zarin-Nejadan, Monteiro, and Noormamode (2008) indicated that the impact of Swiss official development assistance on its export is ambiguous, and it takes time to materialize it.

One way to understand the effect of foreign assistance on recipient economies is to examine the indirect impact of ODA on income through international trade and the transformation of local production. The literature on the impact of official development assistance on developing countries' economies shows abstruse conclusions. Estimates of a cross-section study covering 33 donors and 125 recipient countries showed that developmental aid substantially directly affects donors' exports to recipient countries. However, the effect on recipient export to the donor is not robust (Martinez-Zarzoso, 2019). These findings align with existing literature that repeatedly reported a negative association between aid and recipient export to the donor (Nowak-Lehmann, et al., 2013).

Most studies on developmental aid conducted in the Turkish context have focused on foreign aid's political implications and drivers. For instance, Güngör (2021), Korkmaz and Zengin (2020), and Mehmetcik and Pekel (2020) showed that Turkish foreign assistance is primarily determined by historical linkages, foreign policy goals, religious solidarity, and, most crucially, economic interest.

We reviewed the literature about the linkage between foreign aid and bilateral trade in the above section. However, only some articles addressed the potential link between the Turkish economy and bilateral foreign aid. In the early 2000s, Turkey's foreign aid policy changed dramatically from co-ethnic to global or Muslim Ummah oriented. It was only 85 million in 2002 but jumped to 8,121 billion in 2017. During the Post-2000 era, Turkey applied foreign aid as an effective diplomatic instrument to influence countries and make strategic allies in developing countries, particularly in the Muslim world (Kavakli, 2018). The political implications of Turkish foreign aid have been tremendously discussed in the literature, but its economic and trade implications have yet to get substantial attention from academia. Therefore, this study aims to fill this gap and examine the link between bilateral Turkish official development assistance and export from Turkey to aid recipient countries.

Methods

The gravity equation is a simple econometric model for studying bilateral trade flows between countries. The model describes the trade flow between two countries or a group of countries as directly proportional to their economic mass (GDP) and inversely proportional to the distance. The gravity model of international trade is comparable to the Newtonian physics equation that describes the force of gravity. Pöyhönen (1963) and Tinbergen (1962) are the prior scholars who stipulated the gravity model equation as follows:

$$\mathrm{Exp_{ijt}} = \frac{\mathrm{GDP_{it}} * \mathrm{GDP_{jt}}}{D_{ij}} \quad (1)$$

In multiplicative form, equation (1) can be rewritten as follows;

$$\mathrm{Exp_{it}} = \mathrm{GDP_{it}}^{\beta_1} * \mathrm{GDP_{jt}}^{\beta_2}{}_{\mathrm{jt}} * \mathrm{D_{ij}}^{-\alpha} \quad (2)$$

where (Exp_{ij}) stands for the export value between countries i and j, GDP_i, and GDP_j are the national incomes of countries i and j, respectively. The distance variable ij is used to capture the physical distance between country i and j and is a constant of proportionality.
The logarithm form of the gravity model equation (1), the linear form of the model, and the equivalent estimable equation become:

$$\mathrm{Ln}\big(\mathrm{Exp_{ijt}}\big) = \alpha_0 + \beta_1 \mathrm{Ln}(\mathrm{GDP_{it}}) + \beta_2 Ln\big(\mathrm{GDP_{jt}}\big) + \alpha_1 \mathrm{Ln}(\mathrm{D_{ij}}) + \varepsilon_{\mathrm{ij}} \quad (3)$$

α_1, β1, and β2 stand for coefficients of the parameters to be estimated. The error term $\varepsilon_{\mathrm{ij}}$ captures another determinant of bilateral trade between countries. Equation (3) is the main gravity model equation where export is expected to be a positive function of income and a negative function of distance.

The Model

The above-elaborated literature review summary shows that studies related to drivers of bilateral trade usually apply the gravity model. Similarly, this study applies a gravity model of international trade to comprehend the possible relationship between export and bilateral Turkish official development assistance. The gravity model in our case is constructed; export from Turkey as a country (i) to trade partner as a country (j) is a function of GDPs, and the geographic distance and hence can be written as:

$$\begin{aligned}\mathrm{Ln}\big(\mathrm{Exp_{ijt}}\big) = {} & \beta_0 + \beta_1 \ln(\mathrm{Tur\_GDP_{it}}) + \beta_2 \ln(\mathrm{Re\_GDP_{Jt}}) + \beta_3 \ln\big(\mathrm{TC_{ij}}\big) + \beta_4 \ln(\mathrm{ODA_{ijt}}) + \\ & \beta_5 \ln(\mathrm{Tur\_Pop_{it}}) + \beta_6(\mathrm{Rec\_Pop_{jt}}) + \beta_7 \ln(\mathrm{Tur\_Infl_{it}}) + \beta_8(\mathrm{Rec\_Infl_{jt}}) + \\ & \beta_9 \mathrm{Ottm_{ij}} + \beta_{10} \mathrm{Relg_{ij}} + \varepsilon_{ijt}\end{aligned} \quad (4)$$

where Ln (Exp_{ijt}) is the log of export from country i to country j in a particular year t. LnGDP_i represents the gross income of Turkey, and GDP_J is the gross income of the trade partner of Turkey or aid recipient. Ln (TC_{ij}) is the geographical distance between Turkey and the aid recipient country. Ln (ODA_{ij}) represents the Turkish Official Development Assistance from Turkey to the aid recipient country. The Ln $Infl_{it}$ is Turkey's natural log of Inflation in year t, and $Infl_{Jt}$ is the natural log of Inflation of the aid recipient country in year t. The ln $(Pop_{it}\ and\ Pop_{Jt})$ represents the population of Turkey and the aid recipient country in year t, respectively. The $Ottm_{ij}$ represents Ottoman members; it is a dummy variable that takes a value of 1 if the recipient country was a member of countries under Ottoman Empire leadership or 0 otherwise. $\mathrm{Relg_{ij}}$ is also a dummy variable which takes a value of 1 if 60% of the aid recipient country's population believes in the Islamic religion and otherwise 0.

The reason for including GDP and distance (trade cost) variables in the equation is that these variables are parts of the standard gravity model specification. The GDP of Turkey and its aid recipients in time t are used as a measure of economic size. The GDP is expected to be positively

correlated with export in line with the gravity model hypothesis. Trade cost or distance variable is employed in the analysis as a proxy for transportation cost between Turkey and the aid recipients. The trade cost variable is expected to be negatively related to export. The longer the distance between countries, the higher the trade cost, other things being constant.

To check the effect of Inflation on export from Turkey to her aid recipients, we used Inflation as a proxy for the GDP deflator in our model. Inflation is anticipated to have a negative effect on export. Official Development Assistance (ODA) is the amount of foreign aid given to aid recipient countries for economic development purposes annually. The official development assistance is generally divided into tied and untied to trade, but we are not studying separately in this study. Since official development assistance improves the goodwill and diplomatic relationship between the country, official development will positively affect the export of donors.

The impact of population on bilateral has been viewed differently. For instance, Brada and Méndez (1985) demonstrated how the population might be considered a bilateral export booster. Inançli and Mahamat Addi (2019) argued that greater populations represent larger domestic markets, so the population may correlate negatively with trade flows. A larger population implies larger import and demand. We also included the population of Turkey and the aid recipient country of year t. The population is employed as a proxy for the market size and is expected to impact bilateral trade positively.

We utilized two dummy variables in our regression: Ottoman empire membership and religion. Religion is a dummy or binary variable; if 60% of the aid recipient population believes in Muslim as a religion, it takes the value of "1" and otherwise "0". The shared Islamic religion promotes mutual trust and lower export sunk costs (Lo Turco & Maggioni, 2018). We used Ottoman membership instead of common colonial ties to capture the effects of the historical relationship on the export of Turkey to aid recipient countries. The hypothesis is that countries with similar historical ties tend to trade more and vice versa.

Sample Size and Data Source

We selected those countries that consistently received official development assistance from Turkey. The dataset is a balanced panel comprising annual export, GDP, distance, Inflation, population, official development assistance, and dummies of Turkey and 18 of its aid recipients (see Appendix 2). The data is collected for the period ranging from 1998 to 2019.

Panel Cross-Section Dependence (CD) test

Before estimating the gravity model, the Cross-section dependent test (CD) should be tested to check whether the data is cross-sectionally dependent. If not, depending on the assumptions (Breusch & Pagan, 1980; M Hashem Pesaran, 2021), the estimates of our gravity equation would be biased and contradictory. In harmony with the time and cross-sections in our gravity equation, Pesaran's (2004) residual CD test is calculated as the following;

$$cd = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{I=1}^{N-1}\sum_{J=I+1}^{N}\hat{\rho}_{IJ}\right) \underset{\sim}{\overset{ASY}{}} N(1,0) \quad \text{i,j=1,2….N} \tag{5}$$

The bias-adjusted version of the above is;

$$LM = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{I=1}^{N-1}\sum_{J=I+1}^{N}\hat{\rho}_{IJ}\right)\frac{(T-K)\hat{\rho}^2{}_{ij} - E(T-K)\hat{\rho}^2{}_{ij}}{Var(T-K)\hat{\rho}^2{}_{ij}} \tag{6}$$

Where ρ_{ij} is the sample estimate of the pair-wise correlation of the residuals obtained by OLS.

Since the CD test cannot define time-invariant variables (Nasre Esfahani & Rasoulinezhad, 2017), we computed the CD test only for time-variant variables in our gravity equation. Using the result of Pesaran's (2004) CD test in Appendix 1, the null hypothesis of no CD can be rejected at the 5% level. It indicates that all the panel time series have solid evidence for cross-sectional dependence. Appendix 1 shows that we failed to accept the null hypothesis of no cross-section dependence

(CSD). Therefore, we can apply the Second-Generation Unit root test, the Cross-section Augmented Dickey-Fuller test (CADF), and Hadri Kurozumi.

Second Generation Panel root test

First, we tested the hypothesis of no cross-section based on two basic criteria; first, if the null hypothesis of cross-section dependence is not rejected, the first-generation unit root test is applicable. Second, if the null hypothesis of no cross-section dependence is rejected, then the second-generation unit root test is appropriate. We rejected the null hypothesis of no cross-section dependence, as Appendix 1 shows, so we applied the second-generation unit root test. The main panel unit root tests are the Cross-section Augmented Dickey fuller test, Hadri Kurozumi, and Bias adjusted CD. The null hypothesis of the Cross-section Augmented Dickey-Fuller test is that sample data has a unit root, while the null hypothesis of Hadri Kurozumi is stationary. Hadri Kurozumi test was calculated as follows;

$$Z_A{}^{SPC} = \sqrt{\frac{N(\overline{ST_1} - \xi)}{\varsigma}} \tag{7}$$

and

$$Z_A{}^{LA} = \sqrt{\frac{N(\overline{ST_2} - \xi)}{\varsigma}} \tag{8}$$

Where

$$\overline{ST}_1 = N^{-1} \sum_{I=1}^{N} ST_i{}^{SPC} \qquad ST_i{}^{SPC} = \frac{1}{\sigma_{iSPC}{}^{T^2}} \sum_{i=1}^{t} S^*{}_{it} \sum_{j=1}^{t} \hat{\varepsilon}_{ij} \tag{10}$$

$$\overline{ST}_2 = N^{-1} \sum_{I=1}^{N} ST_i{}^{LA} \qquad ST_i{}^{LA} = \frac{1}{\sigma_{iLA}{}^{T^2}} \sum_{i=1}^{t} S^*{}_{it} \sum_{j=1}^{t} \hat{\varepsilon}_{ij}$$

$$\xi = {}^{1}/_{6} \quad \text{and} \quad \varsigma = {}^{1}/_{45}$$

For CIPS test

$$CIPS^*(N,T) = N^{-1} \sum_{i=1}^{N} S^*{}_{it}(N,T)$$

Since all moments of $S^*{}_{it}(N,T)$ exist by construction, it follows that conditional on W_F.

$$CIPS^*(N,T) = N^{-1} \sum_{i=1}^{N} CAD\, F^*{}_{it} + 0_\rho \text{ (1)}$$

Where $CADF^*{}_{if}$ is given

$$\begin{cases} CADF^*{}_{if} = CADF_{if,} & if - K_1 < CADF_{if} < K_2 \\ CADF^*{}_{if} = -K_1, & if\ CADF_{if} \le -K_1 \\ CADF^*{}_{if} = K_2, & if\ CADF_{if} \ge K_2 \end{cases}$$

The Cross-section Augmented Dickey fuller test (CADF) is two parts: CADF and CIPS.

The CIPS test null hypothesis is the unit root, and ZA^{la} and ZA^{spc} tests null hypothesis is stationary. The critical values for the CIPS tests are found in Pesaran (2007). The basic criteria are; to reject H0 of stationarity if ZA^{la} and ZA^{spc} are greater than 1.645 (obtained from the Pesaran table), and the opposite is true (see Appendix (2)).

Result and Discussion

Model selection method

As demonstrated in the model specification section, we have ten variables – about both donor and aid recipients. We employed General to Specific modeling estimation to choose the appropriate model.

Table 1. Model Selection

Variables	(1) Robust-OLS	(2) OLS	(3) PPML	(4) fe	(5) two-way fixed	(6) Genspec
lnTurGDP	0.407**	0.407**	0.0324	0.741***	5.793**	0.495***
	(0.160)	(0.189)	(0.020)	(0.132)	(2.545)	(0.090)
lnGDP_Reci	0.974***	0.974***	0.083***	0.627***	0.580***	0.963***
	(0.164)	(0.047)	(0.004)	(0.080)	(0.083)	(0.046)
lnDistant	-1.039***	-1.039***	-0.087***			-1.042***
	(0.250)	(0.054)	(0.006)			(0.054)
LnRe_pop	-0.391**	-0.391***	-0.033***	1.159***	1.168***	-0.378***
	(0.169)	(0.056)	(0.004)	(0.232)	(0.228)	(0.055)
LnTurPop	0.027	0.027	0.018	-1.485***	-1.226	
	(1.002)	(0.783)	(0.08)	(0.554)	(8.279)	
LnTurInfl	-0.098*	-0.098	-0.011	-0.126***	0.328	
	(0.050)	(0.072)	(0.008)	(0.045)	(0.697)	
LnRinfl	-0.088	-0.088	-0.010	0.113	0.108	
	(0.300)	(0.114)	(0.011)	(0.078)	(0.077)	
LnODA	0.097**	0.097***	0.007***	0.044***	0.038**	0.101***
	(0.043)	(0.018)	(0.001)	(0.016)	(0.016)	(0.018)
Ott	0.351	0.351***	0.031***			0.358***
	(0.296)	(0.085)	(0.008)			(0.084)
Reli	0.948***	0.948***	0.074***			0.955***
	(0.227)	(0.067)	(0.006)			(0.067)
Constant	-8.552	-8.552	0.503	-15.416**	-158.809	-11.008***
	(17.193)	(11.301)	(1.09)	(7.471)	(131.823)	(2.158)
Observations	393	393	393	393	393	393
R-squared	0.892	0.892	0.863	0.873	0.883	0.891
Time-effect					yes	

Note: Robust standard errors in parentheses. ***, **, and * indicate significant at the 1%, 5%, and 10% level.

Table 1 shows six models: Robust OLS, OLS, Poisson pseudo-maximum likelihood (PPML), One-way Fixed effect, Two-way Fixed effect, and General to Specific Modelling. The General to Specific modeling in column (6) shows which variables significantly affect export from Turkey to aid recipient countries. Turkey's GDP and recipient countries' GDP positively affect export, and distance negatively affects export, which is in line with the main hypothesis of the traditional gravity model. The recipient population is also significant, but it carries ambiguous signs. The Official development assistance is significant in all models, specifically General to Specific modeling. Historical ties (Ott) and shared religion between Turkey and aid recipient countries are also significant determinants of the export of Turkey.

In the Table 2, we will execute a model consisting of only variables which General to Specific modeling indicated as significant. We executed six different models to check if the variables selected by using the General to Specific modeling remain significant across the models.

In the Table 3, we implemented Robust OLS, OLS, PPML, One-way fixed effect, Two-way fixed effect, and least-squares dummy variables (LSDV). In the LSDV, we want to capture the effect of historical ties on export using the membership of the Ottoman empire as a proxy variable of historical linkage between the donor (Turkey) and recipient countries. We also controlled the effect of Islamic religion since Turkey's ruling party is Islamist and propagates global cooperation of the Muslim Ummah agenda. Both religion and Ottoman membership are significant in LSDV. This is in line with previous studies such as Korkmaz and Zengin (2020), which explained that Ottomanism plays a crucial role in Turkey's foreign aid distribution.

Our models of interest – the LSDV and PMML show a significant positive relationship between ODA and export. The coefficient of ODA ranges from 0.0078 in PPML model to 0.049 in LSDV models. This implies that a 1 % increase in ODA increases the export of Turkey to aid recipient countries by 0.01 – 0.05%.

Table 2. Robust Output

Variables	(1) Robust-OLS	(2) OLS	(3) PPML	(4) Fe	(5) Two-way fixed	(6) LSDV
lnTurkGDP	0.495**	0.495***	0.044***	0.844***	4.717***	0.853***
	(0.225)	(0.090)	(0.008)	(0.100)	(1.187)	(0.100)
lnGDPReci	0.963***	0.963***	0.082***	0.586***	0.622***	0.579***
	(0.149)	(0.046)	(0.004)	(0.071)	(0.078)	(0.071)
lndistan	-1.042***	-1.042***	-0.087***			8.996***
	(0.246)	(0.054)	(0.006)			(1.765)
Lnrecip_pop	-0.378**	-0.378***	-0.032***	0.789***	1.153***	0.803***
	(0.153)	(0.055)	(0.004)	(0.212)	(0.228)	(0.212)
lnODA	0.101**	0.101***	0.007***	0.049***	0.036**	0.049***
	(0.045)	(0.018)	(0.001)	(0.016)	(0.016)	(0.016)
Ott	0.358	0.358***	0.032***			17.517***
	(0.295)	(0.084)	(0.008)			(2.974)
Reli	0.955***	0.955***	0.075***			0.374
	(0.222)	(0.067)	(0.006)			(0.275)
Constant	-11.008**	-11.008***	0.460**	-37.796***	-151.012***	-119.602***
	(4.772)	(2.158)	(0.190)	(3.348)	(32.972)	(18.501)
Observations	393	393	393	393	393	393
R-squared	0.891	0.891	0.861	0.866	0.883	0.884
Country						yes
Time effect					yes	

Note: Robust standard errors in parentheses. ***, **, and * indicate significant at the 1%, 5%, and 10% level.

Table 3. Final Robust Output

Variables	(1) Robust-OLS	(2) OLS	(3) PPML	(4) One-way fixed	(5) Two-way fixed	(6) LSDV
lnTur_GDP	0.804***	0.804***	0.070***	0.853***	4.614***	0.861***
	(0.203)	(0.083)	(0.007)	(0.102)	(1.227)	(0.102)
lnGDP_Reci	0.672***	0.672***	0.056***	0.658***	0.653***	0.653***
	(0.090)	(0.021)	(0.002)	(0.070)	(0.080)	(0.070)
lnDist	-1.221***	-1.221***	-0.103***			2.790***
	(0.210)	(0.050)	(0.005)			(0.655)
lnODA	0.085	0.085***	0.006***	0.064***	0.058***	0.064***
	(0.051)	(0.019)	(0.002)	(0.016)	(0.016)	(0.016)
ott	0.704**	0.704***	0.060***			6.925***
	(0.311)	(0.072)	(0.007)			(1.009)
Reli	0.840***	0.840***	0.066***			0.321
	(0.238)	(0.069)	(0.006)			(0.280)
Constant	-17.412***	-17.412***	-0.078	-26.787***	-129.846***	-52.958***
	(4.327)	(2.061)	(0.189)	(1.576)	(33.822)	(5.658)
Observations	393	393	393	393	393	393
R-squared	0.877	0.877	0.846	0.861	0.874	0.861
Country						yes
year					yes	

Note: Robust standard errors in parentheses. ***, **, and * indicate significant at the 1%, 5%, and 10% level.

Turkey has been implementing foreign aid as an instrument of foreign policy. Turkey applied state-based foreign aid, which intends to improve the country's international image – representing herself as a responsible and generous actor in resolving international burdens. There

is tremendous literature on Turkey's foreign aid as a foreign policy tool and instrument. For instance, Akpınar (2013), Baird (2016), Çevik, (2014), Çevik (2018), and Davutoğlu (2013). The post-2000 Turkish foreign policy on international development can be understood from the volume of aid to various developing countries, particularly new regions such as Latin America, Sub-Saharan Africa, and the Far east.

From the positive relationship between Turkish official development assistance and its export to aid recipient countries above, it signifies that increased Turkish official development over the years is followed by increased export volume to aid recipient countries. The positive and significant relationship between Turkish official development assistance (ODA) and export to aid recipient countries shows that ODA is a good strategy for export promotion and international market entry. The findings of this study are consistent with those from the traditional donors (Endo & Murashkin, 2022; Felicitas Nowak-Lehmann, Martínez-Zarzoso, Klasen, & Herzer, 2009)

Conclusion

This study aims to complement earlier studies that primarily focused on the political ramifications of Turkish foreign aid by capturing the relationship between official development assistance and export. The empirical framework of the study is based on an augmented gravity model of international trade in which foreign assistance is mainly stipulated in two ways in the literature. Firstly, foreign assistance is depicted as a part of the trade cost. Secondly, official development assistance is modeled as a transfer that positively contributes to the income of the recipient country. However, this study considers official development assistance as a foreign policy tool that improves the goodwill between the donor and recipient countries and that goodwill reflects in bilateral relationships such as bilateral trade.

Turkey applied for Official Development Assistance as a foreign policy tool to access new markets in the Middle East, Balkans, Africa, and Latin America. Following Turkey's foreign assistance to aid recipients, the volume of Turkish export to recipient countries also increased. The influence of Turkish foreign aid policy can be understood from the extreme flourishment of specific sectors in Turkey, such as health tourism, educational tourism, and merchandise business. Turkish foreign assistance diplomacy has established new bilateral trade friends with Turkey. In the long run, this may shrink Turkey's long lasted trade deficit.

The paper contends that Turkey used ODA as a foreign policy tool to access to new markets in the Middle East, Balkans, Africa, and Asia. Following Turkey's foreign aid to aid recipients, the volume of Turkish exports to those countries considerably increased. The prosperity of Turkey's economy, which was appreciated locally and globally, coincided with its reputation as an emerging global donor. The Turkish Lira has lost its value against other international currencies since 2018, and Inflation is at its highest point. Thus, the economic success that made it possible for Turkey to participate globally in international development stages is now a thing of the past.

This study should have covered the sectoral effects of Turkish foreign aid due to time constraints and data availability. Therefore, future researchers are advised to contribute to this topic by examining the effects of official development assistance on various export industries to determine which sectors substantially benefited from the country's involvement with international development affairs.

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Appendix

Appendix 1. Cross section dependence test

	Constant		Trend and intercept	
	test statis	Prob.	test statis	Prob.
CDLM1	383.981	0.000	418.092	0.000
CDLM2	13.204	0.000	15.154	0.000
CD	10.179	0.000	11.138	0.000
Bias-adjusted LM test	74.022	0.000	71.341	0.000

Appendix 2. Panel unit root tests results (Series in level)

	CIPS intercept	CIPS intercept+ Trend	ZA^{SPc} intercept	ZA^{la} intercept	ZA^{SPc} intercept+ trend	ZA^{la} intercept +trend	LM_D intercept	LM_AD Intercept+ trend
lnexprt	-2.153***	-2.7590***	-2.732	-2.658	-1.719	-1.052	3.583**	3.583**
Lngdp_Tur	-1.452***	-1.7803***	-2.541	-2.415	10.484	14.214*	3.583**	3.583**
lngdp_recip	-2.306	-1.7132	-0.062	2.414**	-2.238	13.163***	31.646***	22.824***
Lnds	-1.9881	-1.9775	0.726	1.232	4.88	26.52***	31.041***	24.010**
lnoda	-2.234**	-2.323***	-1.40	-2.263	3.924	2.752*	3.583**	3.583**
lnTu_p	-1.44**	-1.0824*	94.95	222.16	56.397	283.511	3.583**	3.583**
lnR_p	-1.2354	-1.7132	2.387**	22.89***	20.365***	94.381***	25.563***	22.824***
lnRfl	-0.2988**	-2.1335***	16.425	7.419	-2.298	-1.288	3.583**	3.583**
lnTurInf	-1.2101*	-1.6242***	-0.358	0.743	14.951	26.783	3.583**	3.583**

* Shows that statistics are significant at the 10% level of significance.
** Shows that statistics are significant at the 5% level of significance.
*** Shows that statistics are significant at the 1% level of significance.