



NON-STOP FLIGHTS AND EXPORTS: TURKISH EXPERIENCE

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ABSTRACT

The relationship between direct flights has attracted attention in the literature. Case in point Turkish Airlines opened many new routes between the years 1998 and 2015. In this paper, we investigated impact of airline flight on export. To achieve this, using 51 first time destinations of Turkish Airlines, which opened 145 new destinations between 1998 and 2015, impact of direct flight on exports is analyzed by controlling bilateral real exchange rates and GDP with a panel data method accounting for endogeneity (using Arnello Bond method) between direct international flights and exports. Results suggest each additional first time direct flight increases the exports to those destinations by 12.7 %.

Keywords: International Trade, Transportation, Exchange Rates, Foreign Demand.

Jel Classification: : F14, F18, R41.

DİREK UÇUŞLAR VE İHRACAT: TÜRKİYE DENEYİMİ

ÖZET

Direkt uçuşların dış ticarete ihracat etkisi yazında araştırılan bir konudur. THY 1998 -2015 yılları arasında hızlı bir şekilde büyürken Türk ekonomisi ihracatı da hızlı bir şekilde artmıştır. Bu çalışmada hava yolu taşımacılığının ihracat üzerindeki etkisi araştırılmıştır. Bu bağlamda THY'nin yeni direkt hatlarının Türk ekonomisinin ihracat artışına etkisini arařtırdık. Özetle, THY'nin 1998-2015 seneleri arasında açtığı 145 direkt uluslararası uçuş seferleri arasından 51 ülkeye olan ilk doğrudan seferlerin, o ülkeye olan ihracata etkisi, ülkelerin GSMH, ikili reel kur oranları kontrol edilmek suretiyle ve panel veri metodu kullanılarak incelenmiştir. Makalenin sonuçlar göre açılan her yeni hattın, ihracat ve uçak seferleri arasındaki muhtemel içsellikler (Arnello Bond yöntemi) kullanılarak dikkate alındığında o ülkeye olan ihracatı yüzde 12.7 artırmaktadır.

Keywords: Hava Yolu, Döviz Kurları, İhracat, Üretim, GSYH.

Jel Classification: F14, F18, R41.

1. INTRODUCTION

In this day and age of technology where business meetings between people in different geographies can be conducted in virtual reality, person to person interactions still play import role in

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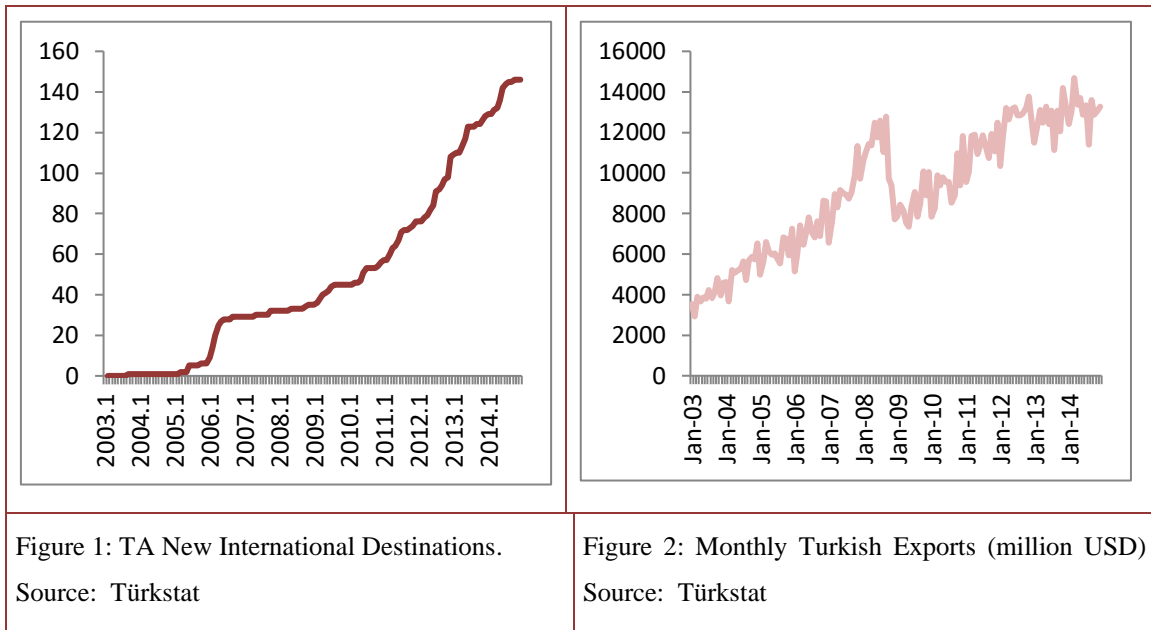
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facilitating international trade. Through person to person interaction; existing trade relations can be consolidated, new customers can be gained, mutual trust between trade partners can be strengthened and chances of successful trade deals are increased. Existence of international direct flights provides person to person interaction enhancing opportunities to business people in international trade. These opportunities manifest themselves in many ways, like reduction in the journey time, allowing face to face communication, first-hand and on-site knowledge of foreign markets and transfer of tacit knowledge between trade partners all of which proved to facilitate international trade (Frankel 1998; Rauch, 1999; Kulendran and Wilson, 2000; Poole, 2010).

Turkish Airlines (TA) has added 145 new international direct flight destinations between 2002 and 2014 (Figure I). Among these new destinations, 51 are to the countries, where TA did not directly fly before. During the same time period, Turkish exports have increased from below 4 billion USD per month to 13 billion USD per month and market composition of Turkish exports has also changed dramatically (Figure 1, Figure 2). Increasing exports has multiple positive results for the Turkish economy such as eliminating imbalances in the balance of payments, increase in total production level, economic growth and employment, and inflow of foreign exchange (Ayhan, 2019: 630). Thus, a possible positive relationship is direct flights and exports is a motivation for TA for proliferation of new non-stop direct flight routes.



While academic research suggests that international direct flights increases exports, it is challenging to establish an empirically acceptable relationship between ongoing international direct flights and exports due to the nature of dual causality between exports and direct flights. Some authors tried to deal with this issue by using instrumental variables (Alderighi and Gaggero, 2012). In this context, opening of large number of new international direct flights to the first time destinations within

a relatively limited time period provides a window of opportunity to examine the impact of flights on exports more precisely in terms of identification and endogeneity.

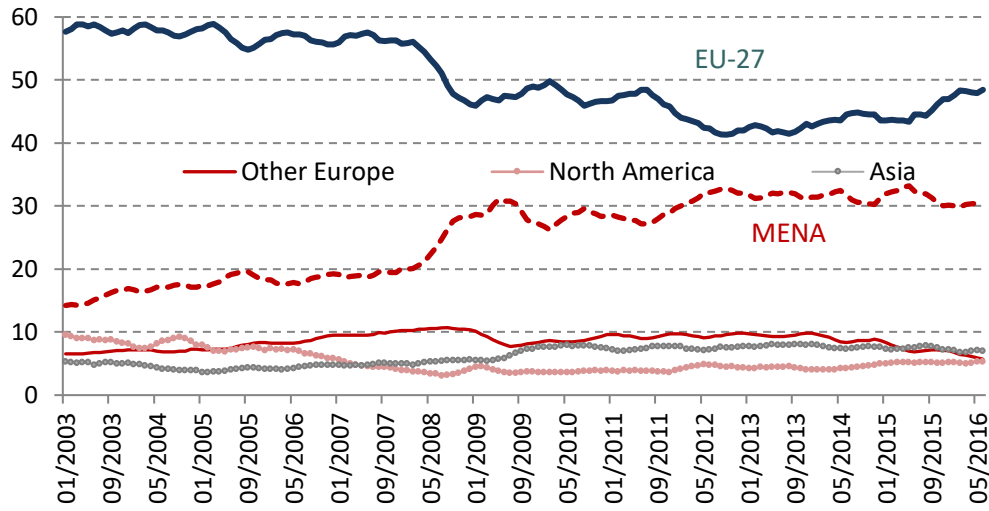


Figure 3: Turkish Exports by Region. Source Türkstat

In this paper, we employ a novel data set described above to empirically investigate the role of international direct flights in boosting exports by controlling the other factors. In line with the previous literature, our findings provide evidence that new international direct flight destinations affect exports positively.

Rest of paper is organized as follows: Section 2 briefly reviews the relevant literature; Section 3 explains the model and data. Results are presented and discussed in Section 4. Finally concluding remarks are made in Section 5.

2. LITERATURE REVIEW

The literature relates international trade to air travel through several channels. One is through reduction of informal trade barriers (Rauch, 1999). In this context, build and maintain networks is communication, and in particular, face-to-face communication (Cristea, 2011) is an important tool. For example, according to Saxenian (1999) personal interactions allow complex business relationships to be managed effectively and Poole (2010) argues the importance of the transfer of tacit knowledge.

Also, non-stop flights facilitate face-to-face contacts and help to expand the knowledge of foreign markets, it allows bringing potential trading partners closer together thus increase the augmentation of their reciprocal trust by trimming travel time. Thus, eventually establishing new trade relationship possibility increases (Frankel, 1997 Rauch, 1999; Kulendran and Wilson, 2000).

According to Grosche et al. (2007) the availability of a non-stop flight can facilitate a businessman's decision to visit a places sites among a set of possible destinations.

Frankel (1997), focusing on high tech capital goods, argued that international air travel positively affects exports.

Using data for Australia and four important travel and trading partners, the USA, the UK, NZ and Japan, Kulendran and Wilson (2000) found supporting evidence that business travel leads to international trade.

Poole (2010) investigated effects of face-to-face communication generated by business travel on international trade within the context of business and social networks. She found that higher share of business travelers among the total passengers positively affect international trade.

Cristea (2011), using U.S. state level data on international business-class air travel as a measure of in-person business meetings, she found robust evidence that the demand for business-class air travel is directly related to volume and composition of exports in differentiated products.

Alderighi and Gaggero (2012) studied the role of non-stop flights on Italian manufacturing sector. Their results show that non-stop flights of Full-Service Carriers have positive impact (about 10%) on the exports.

3. MODEL AND DATA

3.1 DATA and VARIABLES

To measure the impact of direct foreign flight on the exports, we follow the model used in the literature of international economics (Poza, 1992; Obstfeld and Rogoff, 1996; Klassen 2004; Alderighi and Gaggero, 2012). This model links annual exports to GDP's of the trading partners, bilateral real exchange rates. We added to this model a variable for first time direct flight routes opened during the sample period.

$$\log(EX_{it}) = \beta_0 + \beta_1 \log(EX_{it-1}) + \beta_2 \log(GDP_{it}) + \beta_3 \log(BRER)_{it} + \beta_4 FDF_{it} + \beta_{5-23} YEARD + \varepsilon_t \quad (1)$$

Annual data is used in this study.

Log (EX), denotes the natural logarithm of annual US Dollar export of Turkey to each of her 51 trading partners between 1998 and 2015; the data is acquired from World Bank web site.

Log (GDP) is the natural logarithm of the GDP of the respected trade partner for each trade partner of Turkey, this data is also taken from World Bank web site.

Log (BRER) is the natural logarithm of bilateral real exchange rates of Turkey with each of her trading partners. If the Turkish prices are higher relative to the trading partner, Turkish goods become more expensive ceteris paribus. The data is calculated using bilateral nominal exchange rates and GDP deflator of Turkey and GDP deflator of each country by the following formula:

$$BRER_{it} = \frac{NERUSD_{it}^h}{NERUSD_{it}^f} \times \frac{P_{it}^f}{P_{it}^h}$$

NERUSD is the USD exchange rate of Turkey and the foreign country, P is the GDP deflator for Turkey and foreign countries for each 51 countries.

The data is acquired from World Bank web site.

FDF denotes first time direct flight to first time destinations. This variable resembles to dummy variable. It takes 0 for the years during which there are no direct flights to that destinations and it takes 1 after direct flights began to that destination. FDF is a primary data, we did not get from a secondary source. This data is compiled from vast data resources including TA news bulletins, which announce new flights, newspaper and web news reporting new flight destinations for the years between 1998-2015.

YEARDM denotes year dummies to control the economic conditions which affect all the countries in each year.

3.2 Econometric Model: Arellano-Bond Dynamic Panel System

The total number of observations is 790 with 51 groups for 15 years. The time period is relatively small (small T) and the number of the observations is relatively large (large N).

The data set and model summarized above is short time period (t) and wide item panel data model. The causality between exports and flights is both directions; in other words, existence and number of direct flights may cause higher exports; as well as higher exports may lead airline companies open new direct flights routes or increase the number their flights to those destinations. In econometric terms, it is possible to have correlation between current and lagged error term direct flights. In addition, the dependent variable is dynamic, in other words it depends it previous terms realizations.

Due to its dynamic and endogenous structure and under the conditions dictated by the data and by the nature of the relationship between the dependent and the independent variables, we employed Arellano-Bond Dynamic Panel System GMM estimator, which designed for type of situations, to estimate this model.

4. DISCUSSION OF THE RESULTS

Using Arellano-Bond Dynamic Panel System GMM estimators, it's estimated two versions of the model explained above (Equation I). The first model is the baseline model without first time direct flight variable (FDF). The second model includes FDF variable with the assumption of endogeneity of FDF with respect to exports.

The estimated results of models are reported in Table 1. Column 1 presents baseline model without FDF variable. Column 2 presents the result of the model with FDF variable.

The bilateral real exchange rate variable, which has theoretically correct sign with statistical significance close to 10% for both of the models, indicates that higher prices in Turkey relative to trading partners reduces exports 6.75 % percent in Model II and 5.57% in Model I.

The GDP variable has also correct sign with high statistical significance for both of the models. According to this, higher GDP of the trading partners increase Turkish exports to those countries 16% in Model II and 17% in Model I.

First time flight variable, although not highly statistically significant, indicates that a new flight route opening to an international new destination increases exports to that destination around 13.5%. This result is in line with the literature.

Arellano-Bond tests for autocorrelation for the first differences and levels indicate that there are no first order and second order auto correlations for both of the models.

Over identification is strongly rejected for both of the models according to Hansen over identification test.

5. CONCLUSION

This paper empirically investigates whether international direct flights boost exports. To achieve this, we used first time international direct flights to 51 new destinations from Turkey and Turkish exports to those countries. Controlling GDP and bilateral real exchange rate of these countries in an Arellano-Bond Dynamic Panel System GMM estimator framework, we found that opening of a new flight route to a new international destination increases exports to that destination 12.7%.

These results are in line with the literature indicating the positive role of direct flight on international trade.

This paper contributes to the literature in several ways: First, this paper compiles and primary data for flights to new destinations for Turkish airlines, which is to highest number of destinations among world carriers, using vast a newspaper and web site news, TA bulletins. Second this paper uses, bilateral real exchange rate and different GDP numbers for each country. So, in this paper the results also show the impact of real exchange rate and GDP on for each country in a panel setting. Finally, this paper shows the impact of new direct flight on exports by employing the data of flights to first time destinations, which allow better identification for the relationship between flights and exports and second, by utilizing Arellano-Bond Dynamic Panel System GMM estimator to account for endogeneity between flights and exports. In our knowledge this is the only paper in the literature.

Policy implication of the results are important. Each new destination increases the exports more than 10 %. This partially explains the export success of Turkish economy last 15 years.

TABLE 1
Coefficients of the Estimated Model:

| Variables | Model I: No FDF | Model III: FDF |
|--------------------------|-----------------|----------------|
| | Variable | Variable |
| Constant | 2.801*** | 2.133*** |
| Lag I. Log Export | -0.418*** | -0.411*** |
| Lag II. Log Export | 1.048*** | 1.065*** |
| Log GDP | 0.171*** | 0.162*** |
| Log Bilateral RER | -0.0675 | -0.0557 |
| First time Direct Flight | | 0.127* |
| Year=2000 | -0.469*** | |
| Year=2001 | -0.198** | 0.00685 |
| Year=2002 | 0.0336 | 0.243** |
| Year=2003 | 0.149* | 0.480*** |
| Year=2004 | 0.250*** | 0.547*** |
| Year=2005 | 0.116** | 0.646*** |
| Year=2006 | 0.265*** | 0.489*** |
| Year=2007 | 0.437*** | 0.670*** |
| Year=2008 | -0.0609 | 0.837*** |
| Year=2009 | -0.198*** | 0.333** |
| Year=2010 | 0.366*** | 0.160 |
| Year=2011 | 0.334*** | 0.727*** |
| Year=2012 | 0.161*** | 0.703*** |
| Year=2013 | 0.150*** | 0.497*** |
| Year=2014 | -0.469*** | 0.429*** |
| Year=2015 | | 0.263** |

Model Test

| | | |
|---------------------|--------------------|--------------------|
| Observations | 790 | 790 |
| Number of Groups | 51 | 51 |
| Number of Instr. | 49 | 73 |
| F(20,53) | 2686.75 | 3090.74 |
| | Prob.>F = 0.000 | Prob.>F = 0.000 |
| R Square (%) | 83.073 | 83.54 |
| AR(1) | z = -2.23 | z = -2.07 |
| | Prob. > z = 0.026 | Prob. > z = 0.039 |
| AR(2) | z = -3.29 | z = -3.36 |
| | Prob. > z = 0.001 | Prob. > z = 0.000 |
| Hansen Test chi(29) | chi2(29) = 32.25 | chi2(53) = 31.98 |
| | Pr. > chi2 = 0.309 | Pr. > chi2 = 0.987 |

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