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The effects of the Morocco-European Union open skies agreement: A difference-in-differences analysis

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ABSTRACT

In this paper, we examine the effects of the open skies agreement signed between the EU and Morocco in December 2006. Specifically, we exploit the fact that Morocco was the only country in North Africa to sign such an agreement and that the pre-liberalization traffic in all North African countries presented a common trend. We use data at the route level for the period 2003–2010 to run difference-in-differences regressions and to test for heterogeneous responses. We find a 20–35% increase in the number of seats offered on pre-existing routes and a notable increase in the number of new routes offered.

1. Introduction

Air traffic relations between countries are typically regulated by bilateral agreements. Such agreements usually regulate the number of carriers a country is allowed to designate and the number of flights and routes flown, while they place restrictions on both fares and on carriers continuing flights to third-country markets. However, air services within the European Union (EU) have been fully liberalized since 1997, following the introduction of several legislation packages promoted by the European Commission aimed at increasing competition in the EU airline market.

Additionally, various open skies agreements have been promoted by the European Commission over the last decade with several non-EU countries within the framework of the European Neighbourhood Policy (ENP). The main goal of the ENP is to increase economic integration between the EU and its southern and eastern neighbours, all of which are considered by the World Bank as middle-income developing countries (with the exception of Israel).

In this paper we use the open skies agreement (OSA) signed between the EU and Morocco in December 2006 to identify the effects of the liberalization of the air transport market in a middle-income developing country. We identify two specific aspects of the impact of the Morocco-EU OSA on Morocco's air traffic. First, we identify the effect of the agreement on the number of seats offered on pre-existing routes. Second, we identify the effect of the deregulation on the probability of new routes being opened up between the participant countries.

We use data at the route level for the period 2003–2010 between North African and European countries. We exploit the fact that Morocco was the only country in North Africa to sign such an agreement and that the pre-liberalization traffic of all North African countries presented a common trend. Our empirical assessment of the effects of the Morocco-EU OSA is made

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by comparing changes in traffic volume and changes in the number of routes operated between Morocco and European countries with the corresponding changes for the rest of the North African countries and the EU.

Several econometric papers have examined the liberalization of international passenger aviation services.[1] Most focus on the United States, which has signed several OSAs with countries from around the world since the early nineties. Micco and Serebrisky (2006) found that OSAs reduce air transport costs by 9% and increase the share of imports arriving by air by 7%. However, these results only hold for developed and upper middle-income developing countries. Whalen (2007) found a modest increase in fares on routes between the United States and Europe affected by the OSAs, while all the capacity expansion was undertaken by carriers on routes between their hubs. Using data from Northeast Asia to the United States, Zou et al. (2012) found that the lower airfares associated with an open-skies agreement may be counterbalanced by the mutual forbearance strategy promoted by airlines competing in multiple markets. Finally, Cristea et al. (2014) found air traffic to be 17% higher in liberalized markets than in still-regulated markets, while OSAs led to an aggregate decline of 14.4% in quality-adjusted prices.

Evidence of the impact of OSAs outside the US is scarce, given data availability restrictions, especially regarding fares.[2] Previous studies have generally used cross-sectional data and their main variable of interest has been the Air Liberalization Index (ALI) scores computed by the World Trade Organization (WTO). Piermartini and Rousová (2013) found that OSAs increased passenger traffic by 5%, using worldwide data from nearly 2300 country-pairs for 2005. Cristea et al. (2015) performed a similar analysis with data for 2010 by combining country-pair data and city-pair data. Their results suggest that a one-unit increase in the ALI leads to a 1.8% increase in the number of air passengers and that more liberal agreements are associated with more city-pairs being served by direct flights. Ismaila et al. (2014) also found a positive and statistically significant effect of liberalization on passenger flows using a sample that included 112 country-pairs with Nigeria for 2010. Specifically, a one-unit increase in the ALI raised the level of traffic demand by 8.76%. Finally, some studies have found a substantial positive impact on traffic flows in Canada due to more liberal bilateral agreements using country-pair panel data (Dresner and Oum, 1998; Clougherty et al., 2001).

We add to this literature by examining the impact of a specific multilateral OSA with a middle-income developing country. Furthermore, we employ a methodology in a treatment evaluation framework that compares changes between comparable treated and control routes. We check the robustness of our results to differences in the pre-existing characteristics of the treated and control groups by applying a matching procedure.

Previous studies of US international routes have either focused on bilateral agreements while mixing data for developed and developing countries (Micco and Serebrisky, 2006; Cristea et al., 2014) or they have focused on high-income countries or dense routes (Whalen, 2007). Studies providing wide coverage use data for just one year so that they are only able to identity traffic differences between country-pairs or city-pairs subject to different degrees of liberalization (Cristea et al., 2015; Piermartini and Rousová, 2013).

In contrast, we are able to examine the change *per se* in the regulation regime using the logic of the difference-in-differences approach as we work with data before and after the OSA was signed between Morocco and the EU, and we conduct our comparison by focusing on similar routes operated by neighbouring countries that were not affected by the liberalization agreement. Furthermore, we do not only analyse changes in existing routes but also, in line with Cristea et al. (2014, 2015), changes in the probability of new routes being opened up.

Finally, the impact of the OSA between the European Union and Morocco may be strongly influenced by the entry of low-cost airlines or by the shift of charter airlines to scheduled flights. In contrast to previous studies, our analysis focuses on short-haul or medium-haul routes and many of these routes have a high proportion of passengers for tourism. Some few works have analyzed the impact of low-cost airlines on traffic at the route level with contradictory results (Bettini and Oliveira, 2008; Goldsbee and Syverson, 2008; Fageda, 2014). Here, we may provide new insights about the impact of low-cost airlines on route traffic as their entry in the Morocco market was restricted in the pre-liberalization period.

To this point, Dobruszkes et al. (2016) use aggregate data to compare the evolution of seats and the total number of routes offered between the European Union and Morocco and Tunisia. Their data show a higher increase of traffic and a higher increase in the number of routes offered in Morocco after the liberalization took place. At the same time, their data show an increasing presence of low-cost airlines. While the study of Dobruszkes et al. (2016) provides interesting insights on the effects of the OSA agreement between Morocco and the European Union, we can identify the causal relationship between liberalization and air traffic. Indeed, we are able to quantify the magnitude of the additional increase of seats in routes from Morocco in relation to routes from other North African countries due to the OSA agreement, after controlling for the main determinants of seats at the route level (distance, population, income and so on) and for the presence of observable and unobservable differences in the pre-existing characteristics of Morocco and the rest of North African countries. Furthermore, as we have access to data on the market structure at the route level, we are able to determine whether the change in the

[1] Some studies use analytical or computational models to examine the welfare effects of air transport liberalization policies (Adler et al., 2014; Gillen et al., 2002). Here we focus the attention on studies that follow an econometric approach as it is the one used in this paper.

[2] Various papers have examined the impact of deregulation within the European airline market. Marin (1995) investigated the impact of liberal bilateral agreements on a set of 35 European routes for the period 1982–1989 and found that bilateral agreements lead to greater competition both in terms of prices and frequencies. Schipper et al. (2002) used a sample of 34 European routes with varying degrees of liberalization for the period 1988–1992 and found that fares are lower and frequencies are higher on fully liberalized routes. However, the high level of economic integration between the countries of the EU mean these studies were conducted in a very different context to the one examined here.