



# Effects of corruption on efficiency of the European airports



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## ABSTRACT

The effect of corruption on airport productive efficiency is analyzed using an unbalanced panel data of major European airports from 2003 to 2009. We first compute the residual (or net) variable factor productivity using the multilateral index number method and then apply robust cluster random effects model in order to evaluate the importance of corruption. We find strong evidence that corruption has negative impacts on airport operating efficiency; and the effects depend on the ownership form of the airport. The results suggest that airports under mixed public–private ownership with private majority achieve lower levels of efficiency when located in more corrupt countries. They even operate less efficiently than fully and/or majority government owned airports in high corruption environment. We control for economic regulation, competition level and other airports' characteristics. Our empirical results survive several robustness checks including different control variables, three alternative corruption measures: International Country Risk Guide (ICRG) corruption index, Corruption Perception Index (CPI) and Control of Corruption Index (CCI). The empirical findings have important policy implications for management and ownership structuring of airports operating in countries that suffer from higher levels of corruption.

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## 1. Introduction

This paper investigates the relationship between airport efficiency and corruption in Europe. The determinants of airport efficiency have been largely analyzed in the literature. Studies found that ownership forms (Oum et al., 2006; Georges Assaf and Gillen, 2012; Adler and Liebert, 2014), the level of competition (Chi-Lok and Zhang, 2009; Malighetti et al., 2009), economic regulation (Georges Assaf and Gillen, 2012; Adler and Liebert, 2014) and institutional arrangements (Oum et al., 2008), among others, affect the performance and productivity of airports. The impacts of corruption on airport cost efficiency have received limited attention.

To our knowledge, the study by Yan and Oum (2014) appears to be the only one that investigates the effects of corruption on productivity and input allocation of airports. Using the case of major commercial US airports, their findings reveal that corruption negatively influences airport productivity: in more corrupt environments airports become less productive and tend to use more contracting-out to replace in-house labor. Nonetheless, their empirical analyses are limited to the US

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airports, which have limited forms of governance. US airports are owned and operated either by a branch of government (mostly municipal or metropolitan government) or through an airport or port authority set up by government. In this study, we extend the analysis of Yan and Oum (2014) to include different forms of airport management and ownership, including mixed public–private ownership with private minority, mixed public–private ownership with private majority and fully private ownership.

In recent years, the private-sector participation in airport management and/or ownership has become a worldwide trend. Starting from the seven major airports in UK including Heathrow, Gatwick and Stansted airports in 1987, many airports in Europe are fully or partially privatized and/or in the process of being privatized.<sup>1</sup> The main goal of airport privatization is to allow for easier access to private sector financing and investment, and to improve operating efficiency (Oum et al., 2006). We argue that privatized airports operating in corrupt environments may not achieve higher levels of efficiency because the incentives for managers to pursue efficiency goals are lower. Furthermore, private sector managers have more autonomy to change the allocation of inputs compared with bureaucrats, then they may focus on deriving personal benefits.

Our research is motivated by the literature on the effects of corruption on firm performance, and the empirical findings of Yan and Oum (2014)<sup>2</sup> and Dal Bó and Rossi (2007)<sup>3</sup> on the negative correlation between corrupt environments and firm productivity. Corruption, which is defined as the misuse of public resources for private gains (Svensson, 2005) is a major source of economic inefficiency, as it diverts scarce resources from their most productive use. Furthermore, corruption is found to divert firms' managerial efforts from productive activities to rent-seeking activities including political connection building (Fisman, 2001; Svensson, 2003; Clarke and Xu, 2004; Khwaja and Mian, 2005; Dal Bó and Rossi, 2007; Cai et al., 2011). This study attempts to contribute to both the literature on the influence of corruption on economic performance at the micro level and the literature on the efficiency of airports.

We use airports located in Europe to investigate our research question. The corruption levels of European organizations are relatively lower compared with the rest of the world; however evidence show that corruption remains a major concern in the European countries. Empirical findings of Hessami (2014) suggest that corruption in the broad sense of use of government office for private benefit is an issue in OECD countries and is not limited to low-income countries. Furthermore, the OECD (2014) reports that bribes are not just a problem for developing world: bribes are being paid to officials from countries at all stages of economic development. The report also reveals that bribes are usually paid to win public contracts from western organizations and most bribe payers and takers are from wealthy countries.

The airport industry in Europe is not free from corruption scandals; for instance, the *New York Times* reported that a \$183 million airport project in Spain has become a symbol of the “wasteful spending that has sunk Spain deep into the recession and the banking crisis”.<sup>4</sup> Corruption was also exposed in the reconstruction of Terminal 2 at Germany's Frankfurt Airport in 1996.<sup>5</sup> More recently in 2014, bribery scandals hit the airport of Berlin Brandenburg (BER); bribes were suspected to have been paid by firms wanting to secure airport contracts.<sup>6</sup>

We use an unbalanced panel data set consisting of 47 major airports from 27 European countries during the 2003–2009 period to empirically investigate the impacts of corruption on operating efficiency. Our main corruption measure is the country-level International Country Risk Guide (ICRG) corruption index.<sup>7</sup> The residual (or net) variable factor productivity purchased from the Air Transport Research Society (ATRS) is used as measure of airport operating efficiency. We find that corruption lowers airport managerial efficiency; and the impacts depend on the airport ownership form. Our results confirm the previous findings that privately owned airports, including majority and fully private ownership, are generally more efficient than majority and/or fully government owned airports. However, privately owned airports operate less efficiently than their publicly owned counterparts in high corruption environment. We control for the form of regulation prevalent across European airports, levels of competition, airport characteristics, and potential shocks that may affect airport efficiency during the 2003–2009 period. Our empirical results withstand several robustness checks including different control variables, three alternative corruption measures: International Country Risk Guide (ICRG) corruption index, Corruption Perception Index (CPI) and Control of Corruption Index (CCI) and change in the ownership categories.

The remainder of this paper is organized as follows: Section 2 summarizes the literature on corruption and airport efficiency. Section 3 presents the methodology for computing airport efficiency and assessing the impacts of corruption on the efficiency. Data sets are described in Section 4 and Section 5 defines the variables used in the analysis. The empirical results are presented in Section 6, followed by some robustness checks in Section 7. Finally, conclusions are given in Section 8.

<sup>1</sup> For example, majority stakes in Copenhagen Kastrup, Vienna International, and Rome's Leonardo Da Vinci Airports have been sold to private owners.

<sup>2</sup> Yan and Oum (2014) argue that in corrupt environments, bureaucrats have no strong incentives to pursue mandated tasks, leading to a loss of productivity for publicly owned airports.

<sup>3</sup> Dal Bó and Rossi (2007) argue that corrupt countries are strongly associated with more inefficient firms (public and private) in the sense that firms employ more inputs to produce a given level of output.

<sup>4</sup> The management of the airport of Castellón has been questioned since the airport has not received a single scheduled flight since its inauguration in 2011. See *The New York Times* (July 19, 2012): “In Spain, a symbol of ruin at an airport to Nowhere”.

<sup>5</sup> See *The Financial Times* (July 2, 1996): “German Airport Corruption Probe Deepens: Five Jailed and 20 Companies under Investigation” and *Reuters Business Report* (September 25, 1996): “German corruption wave prompts action”, reported in Rose-Ackerman (1999).

<sup>6</sup> For more information, see *The Local: Germany's news in English* (May 28, 2014): “Bribery probe hits Berlin's scandal airport”.

<sup>7</sup> Similar as in Dal Bó and Rossi (2007), we use the ICRG corruption index as our main measure of corruption. The index possesses the advantages of transitivity compared with other indices including World Bank corruption index and/or Transparency International corruption index.

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