



A quantitative cross-modal analysis of transportation firms' transaction costs – Are airlines any different?

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A B S T R A C T

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This paper applies a top-down approach to transaction cost measurement to identify the size of the transaction sector within types of transport firms in Britain, including rail and bus operating firms but also and importantly of airlines. Whilst this cross-sector analysis shows differences for a snapshot in time, it also reveals changes of transaction costs over time. Our results suggest that airlines employ a relatively large number of transaction staff. However, in contrast to the train and bus operators, airlines in Britain have managed to reduce the level of their transaction costs substantially over time both in relation to output and operating cost.

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1. Introduction

As a result of a number of factors, most notably the emergence of the low cost carrier business model, the global economic recession, and fuel price volatility, the focus of airlines has increasingly been on cost management. In particular Fuhr (2009) and others have argued that a better understanding transaction costs is important in this regard. Nevertheless, this is limited empirical evidence on the level of transaction costs of airlines, indeed, there is no accepted understanding of the term. Here we define them as the costs of the preparation, negotiation, enforcement and monitoring of contracts and internal relationships of firms.

The paper builds on recent work that applied a top-down approach to transaction cost measurement in rail firms in EU countries (Merkert, 2012). The key findings were that for a cross-country comparison of a number of European railways in 2006/07, the level of transaction costs were highest for British train operating companies. In addition, it was shown that the transaction costs of these British operators had increased substantially over time, much more than the increase in operating costs of these firms over same period (Merkert, 2010). It may, therefore, be useful to see whether it is also possible to measure the level of transaction costs for other transport modes in Britain.

According to the core concept of transaction cost economics, transaction costs are usually high if their associated asset

specificity, frequency, uncertainty and complexity are high (Williamson, 2005). If that is the case, it can be argued that airlines should be generally associated with high levels of transaction costs. The airline industry is usually perceived as very service oriented (although the level depends on the business model adopted) and negotiations between airlines, airports and other agents are (depending on the network structure) frequent and often very complex (Fuhr and Beckers, 2006). In the airline industry, similar to the British rail industry, a large number of organisations are involved in the production of transport services, thus we may expect the level of transaction costs to be higher in both of these industries in comparison to the bus industry, which has a far simpler mode of operation. Both airlines and airports are also seen as very capital intensive, which can result in relatively high asset specificity. Finally, airlines are often uncertain about a number of wider economic environmental factors as well as the behaviour of their customers and suppliers. In particular, these unpredictable factors, such as frequent changes in regulation and highly volatile fuel prices, may have resulted in increased uncertainty and thus the need for such risks to be managed.

All of these factors would suggest an increase in the level of transaction costs of airlines over time. A good indicator of such increased uncertainty is with respect to changes in fuel prices. Nowadays fuel is often hedged, which although protecting the airline against future price increases, introduces some uncertainty over whether the hedging strategy actually adopted is indeed the best strategy to adopt. Lower transaction and operating costs as a result of reduced fuel price risks may outweigh the higher management cost of buying/selling such commodities and hence

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there could be a reduction in the level of transaction and costs. However, our hypothesis is that the level of transaction costs of airlines is likely to be at least as high as that of railways and perhaps transaction costs are an important key driver of the escalating operating cost of the aviation industry.¹

2. The concept of transaction cost measurement

In addition to Williamson's (2005) concept of indirect transaction cost measurement, (the higher the asset specificity, frequency and uncertainty of a transaction, the more transaction costs will arise if this transaction is not appropriately governed), other methods of more direct transaction cost measurement have emerged. Although there is neither a universally accepted definition of the term 'transaction costs' nor a standard approach to estimating such costs, it is widely-accepted that transaction costs are not zero. As stated above, these costs are very often understood to be those associated with the preparing, negotiating, enforcing and monitoring of contracts (Coase, 1960). It could therefore perhaps be more clearly termed 'contract management costs', but these ultimately are transaction costs. It is also accepted now that their level changes over time. Langlois (1992), for instance, has revealed learning effects regarding probabilities of future events which make parametric uncertainty associated with the relevant transactions less important over time. If, for example, an airline starts a new route to a country that it had no business with before, it will initially have to invest time and staff to establish contacts in that country and a knowledge base about the relevant market. Initially, it might even enter into unbeneficial deals or find itself in conflict with local regulators or aviation authorities. Over time the airline will, however, establish the necessary relationships and learn from experience, so that the initially high transaction cost in the new environment will decrease over time. On the other hand, as markets and services become more complex, through for example the contracting out of functions such as the maintenance of vehicles etc, then as these functions become external to the organisation transaction costs with external bodies will almost certainly increase. If transaction services are outsourced, the internal transaction cost savings may however outweigh the increase in the higher transaction costs that result from the contracts with the external parties.

3. Methodology

As noted above, this paper aims to estimate the level of transaction costs by identifying the size of the transaction sector within transport firms. The model applied also seeks to examine the change in transaction costs over time and build on the methodology developed by Wallis and North (1986, 1988) and Merkert (2010). As with Dietrich's study (2003), it aims to separate production and transaction elements of firms' staff costs. In order to exclude external factors (e.g. political, cultural and institutional effects), this paper focuses entirely on the British passenger transport market. The aim of the paper is to measure and compare the transaction costs of British airlines, train operating companies and bus operating companies. Since the paper intends to measure the transaction costs of these firms over a number of years, the results will also indicate how these have changed, both absolutely and relatively, for each mode over time.

The methodology is similar to that adopted by Merkert (2012), in that the key variable for the rather macro top-down approach of

transaction cost measurement in this analysis is staff employed in transaction jobs, namely those in management and administrative positions in transport firms. In this paper, a firm is defined as the smallest entity of a group that produces an annual account (for example, we analyse Virgin Atlantic Airways Ltd. and West Coast Trains Ltd. (Virgin Trains) separately as opposed to the parent company Virgin Group Ltd.). External consultants, outsourced transaction staff and also transaction staff that work in parent companies are not captured with this approach. For example, for airlines that are owned by tour operators some transaction costs might be assumed by the parent company. However, since most bus operators and rail companies are also owned by multi-national parent companies, we argue that this limitation applies to all three modes to a small but similar extent.

To quantify the transaction sector/costs ($TSC_{a,year}$) of all passenger transport firms in a single mode (airlines, railways, buses) for a specific year, the following equation is used:

$$TSC_{a,year} = \sum_{i=1}^n (M_{i,a,year} \cdot w_{M_{i,a,year}}) \quad (1)$$

where $M_{i,a,year}$ represents the number of transaction staff per firm i in transport mode a at the end of the relevant financial year and $w_{M_{i,a,year}}$ their unit costs (wages, social security and pension costs per annum). To compute the size of these costs for all passenger transport firms within one transport mode in Britain in a specific year, the individual firm transaction costs ($TSC_{i,a,year}$) of all passenger operators in our sample (n) in that year are added together for each mode of transport.

Management and administrative staff (transaction staff) are defined as staff that are not directly involved in operations (e.g. train drivers or maintenance), which includes finance, marketing, human resources and other similar departments.

Methodologically, we need to treat railways and buses differently from airlines. Major differences occur between how railway and bus firms, which in many cases have the same owners, report staff numbers and their associated costs in their annual accounts to the way that airlines report such figures. Airline accounts in general are much easier to obtain and most airlines report detailed financial data to the International Civil Aviation Organization (ICAO). Using these two sources, particularly the latter, we collected data for the airlines in our sample on both staff numbers and staff costs split into staff categories.² While pilots/co-pilots, cabin crew, maintenance and overhaul personnel form the operational staff, sales personnel as well as all other management and administration staff form the transaction staff. In contrast to the pure definition of transaction cost (Coase, 1960) our approach uses a proxy to measure these costs as accurately as possible. One could argue that our proxy captures some staff that are not involved in any transaction services nor have a transaction occupation. As this applies to all three modes in a similar way and because we manage to separate the majority of production staff from the transaction staff in all three modes, the cross-modal results are still valuable.

Although the data on staff costs and the number of employees in two categories, management and non-managerial production staff, were collected the rail and bus firms, it proved to be impossible to obtain data on the relative costs of the two staff categories. These had to be estimated by regressing staff cost on the number of staff in each category and by using the ratio of the coefficients to

¹ According to data of the UK Civil Aviation Authority (CAA) the operating cost of the major UK airlines increased 10% above inflation between 2000 and 2008.

² Since the UK CAA only publishes data on 12 'major' airlines, we use in addition ICAO data that includes all UK passenger airlines. As the ICAO data is published in US\$, we converted the cost values into £ by using the relevant average annual US\$/£ exchange rates provided by the OANDA Corporation.

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