



## Measuring the efficiency of trade shows: A Spanish case study



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### HIGHLIGHTS

- The study examines trade shows efficiency for the exhibiting firm.
- The study uses a multi-stage DEA methodology and nonparametric test.
- The study introduces specific variables to investigate differences in efficiency.
- The results show that IFEMA could improve efficiency levels.
- The nonparametric tests reveal significant differences in efficiency.

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### ABSTRACT

Trade shows are an important industry in the Spanish economy which contribute positively to regional development. However, the cost of attending a trade show is very high for exhibiting firms and so knowledge of trade shows' efficiency is necessary in order to define the decision making process for the exhibiting firm. With the aim of evaluating the efficiency indexes of operating trade shows, this study applies a multi-stage methodology for oriented DEA models and a nonparametric test to analyze the differences in efficiency levels driven by specific variables and organizational forms. The sample is made up of 45 trade shows at IFEMA (Madrid's Fair Institution). The results show significant differences in efficiency across IFEMA. The nonparametric tests reveal differences in efficiency levels driven by the sector and the type of trade show. Moreover, the evidence allows provide managerial implications and future developments.

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### 1. Introduction

The growing number of visitors to the trade shows in the Spanish economy over the last few years requires an assessment of the performance in this sector. Originally trade shows were considered a tool for communication and promotion. However this view has been challenged and replaced by the idea that trade shows are mainly events that sell products and services or where contracts are signed (Bonoma, 1983). Trade and exchange opportunities are major motivating factors for both exhibitors and visitors (Jin, Weber, & Bauer, 2012).

The trade show concept has evolved over time in order to adapt to the business and economic needs of the moment, and has today become an important tool for communication and the development

of relationships with customers (Jiménez, Cazorla, & Linares, 2002). It is therefore a dynamic tool that can vary depending on socio-economic needs. With the current financial crisis, there are trade shows that have disappeared, others have redefined their approach and focus, and additionally, the number of trade shows offering bargain or outlet products has risen.

The trade show market is increasingly competitive and recent research has analyzed brand value for service providers in a trade show (Geigenmüller & Bettis-Outland, 2012) and the importance of attracting a significant number of exhibitors and visitors in order to obtain a high yield (Jin & Weber, 2013). Considering the cost of attending a trade show is very high, some previous studies have analyzed the effectiveness of trade shows as a promotional tool for small businesses (Evers & Knight, 2008).

The main reasons that exhibitors give for attending trade shows include the promotion of activities related to sales, information about sector variables (competitors, customers, products), improvement of image and development of relationships with current and potential customers (Hansen, 2004). However,

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participation in trade shows is expensive for exhibitors, so they need to know what factors influence their performance and efficiency. Therefore, developing tools that enable the performance evaluation is of critical importance, particularly in order to provide policy makers with guidelines, to correct inefficient management decisions and to promote positive effects from the competition (Barros et al., 2011; Botti, Briec, & Cliquet, 2009). Business results are related to the correct allocation of productive resources, with efficiency being an appropriate concept that shows the relationship between resources and results. The efficiency results obtained by trade shows provide great information for exhibitors who attend the trade shows for their decision making processes.

In the past, efficiency assessment was restricted to performance indicators; however, indicators are partial measures (Oliveira, Pedro, & Marques, 2013). To overcome this limitation, the recent literature has introduced more comprehensive methods such as Data Envelopment Analysis (DEA) and Stochastic Frontier Approach (SFA). Both these methods have the advantage of accounting for multiple inputs and outputs variables (Tsiionas & Assaf, 2014).

DEA is the method which applies nonlinear programming techniques to measure the efficiency of Decision Making Units (DMU). The methodology is a nonparametric, multi-factor and efficiency analysis tool that considers several input and output measurements in evaluating relative efficiencies. It allows the identification of appropriate benchmarks (Barros & Mascarenhas, 2005). DEA is used in the main area of research on frontier modeling alongside the stochastic frontier models, and both models are useful in analyzing efficiency. However, DEA is preferred when the researcher has doubts on the functional form to adopt (Barros & Dieke, 2008).

In line with the prior literature on efficiency (Barros & Dieke, 2008; Barros & Mascarenhas, 2005; Botti, Peypoch, Robinot, & Solonandrasana, 2009; Hwang & Chang, 2003), this study adopts output-oriented technical efficiency DEA measures to explore the efficiency of the IFEMA trade show.

The oriented DEA models are often solved in two steps. However, the maximization of the sum of slacks (in the second stage of the DEA model) may not always identify a representative projected DMU on the efficient frontier. To overcome this limitation, a multi-stage DEA methodology for oriented DEA models is applied (see Coelli, 1998). This method conducts a sequence of radial movements to identify the efficient projected DMU and hence may specify satisfactory peers and targets. By employing DEA as the analytical tool, this work attempts to answer the following questions: What is the efficiency of the IFEMA trade show? What is the efficiency of a particular trade show in order to define the decision making process for the exhibiting firm? These questions are unanswered in previous trade shows literature.

The IFEMA trade show was selected due to its importance and representativeness. IFEMA is a major economic force that contributes positively to regional development in Madrid (Spain). For three decades the IFEMA trade show has received over 80 million visitors, has been attended by about 550,000 firms and has organized more than 1500 trade shows. The economic impact of IFEMA is valued at 2 billion euros in revenue and provides 40,000 direct and indirect jobs (IFEMA, 2013).

The second objective of the paper is to evaluate whether the levels of efficiency reached by the IFEMA are conditioned to specific characteristics of trade shows. The nonparametric Mann Whitney *U* test and the Kruskal–Wallis test are used to analyze whether the sector, the type of the trade show (professional, public and mixed), the frequency of the trade show (annual, biannual and biennial), the number of countries represented and the free passes issued show statistical differences in efficiency levels. The Mann–Whitney *U* test is used to compare two groups of characteristics (e.g.

consumer sector and investment sector) and the Kruskal–Wallis test is used to compare more than two groups of characteristics (e.g. professional trade shows, public trade shows and mixed trade shows). Using a nonparametric test, the second study answers the question: ‘What specific characteristics influence the differences in efficiency scores of IFEMA trade shows?’.

In summary, the contribution of the paper is twofold. Firstly, the paper extends existing research (Hansen, 2004; Jin & Weber, 2013; Jin et al., 2012) evaluating the efficiency level and returns to scale of a major trade show, IFEMA. Secondly, the results offer an additional insight into the influence of specific variables in efficiency levels. As previous literature has mainly focused on the destination attractiveness, the convention image, location, etc. (see e.g. Jin & Weber, 2013; Jin et al., 2012) the specific factors included in this study represent potential avenues for future research. The main findings suggest that trade shows operate at a low level of efficiency and significant differences in efficiency levels.

The paper is organized as follows. First, the next section outlines the relevant theoretical framework and prior research. Second, the following section analyses Spanish trade shows and particularly the trend of the IFEMA. Third, the methodology framework is explained. Fourth, the sample and the data collection are presented. This is followed by the results section, where the results of the DEA analysis, the results of the efficiency determinants and the robustness tests are presented and discussed. Finally, the last section summarizes the contributions of this study, as well as the managerial implications and suggestions for future research.

## 2. Literature review

There has been very limited research into the efficiency of the exhibition industry. Most of the previous literature has evaluated the commercial aspects, the criteria used by potential visitors to rate trade shows they visit (Berné & García-Uceda, 2008; Lin, 2010), analysis of the factors influencing the performance of trade shows (Gopalakrishna & Lilien, 1995; Hansen, 2004; Kerin & Cron, 1987; Lee & Kim, 2008), the influence of the exhibitor's objectives in the results (Cavanaugh, 1976; Sicilia, 2008; Tanner & Chonko, 1995), analysis of the behavior of attendees during the trade show (Gopalakrishna, Roster, & Sridhar, 2010; Rinallo, Borghini, & Golfetto, 2010; Wong, Li, Peng, & Chen, 2014) and after the trade show (Gottlieb, Brown, & Drennan, 2011; Kim, Kim, & Seol, 2013), and the influence and use of internet in the performance of trade shows and in relationship value creation (Geigenmüller, 2010; Kalafsky & Gress, 2013; Ling-yee, 2010). Given the high cost of attending a trade shows, several studies have focused on analyzing the effectiveness of trade shows as a promotional tool for small businesses (Browning & Adams, 1988; Evers & Knight, 2008; Tanner, 2002).

The trade show market is increasingly competitive and recent studies have analyzed the brand value for service providers in a trade show (Geigenmüller & Bettis-Outland, 2012), the importance of achieving successful exhibition branding to ensure that the exhibition organizer can attract a significant number of both exhibitors and visitors, and so operate in the most profitable way (Jin & Weber, 2013) as well as the impact of clusters on exhibition destination attractiveness (where the clusters are considered to be concentrations of businesses on particular localities) (Jin et al., 2012). Evidence from firm-level surveys suggest that the amount of importance placed on trade show attendance as part of a firm's internationalization strategies is related to export growth (Kalafsky & Gress, 2013).

This study adds to some of the previous research in trade show literature concerning the performance, exhibition destination development and exhibition organizer (Hansen, 2004; Jin & Weber,

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