

## EFFICIENCY OF THE EXHIBITORS AT ART TRADE SHOW

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### **Abstract**

*Trade shows are a valuable, but expensive, promotion tool that requires measuring its efficiency. The purpose of this research is to develop a model of trade show efficiency. It supports strategic decision making, both for exhibitors as well as organizers of art trade show. For this, we apply a DEA model (Data Envelopment Analysis), which includes inputs and outputs. The input indicators are experience, price, depth of product line and number of stand member. And the outputs indicators are sales, information, relations and image. DEA Model is tested empirically against a 54 Spanish exhibitors at Arco International Art Trade Show. The results confirm that more than half the exhibitors at ARCO show a poor assignment of resources, with much lower efficiency results (90%). Finally, this research determines that it is necessary to increase information, sales and image outputs.*

**Keywords:** ARCO, Art sector, Data Envelopment Analysis, Efficiency, Trade show.

### **1. Introduction**

Trade shows are one of the most profitable means of promotion in the business market (Blythe, 2002; Gopalakrishna & Lilien, 1995; Lee & Kim, 2008; Ling-ye, 2007). Over the last years, the number of trade shows in Spain has increased more than 50% and the visitor attendance has tripled (Jiménez et al., 2002). Art trade shows are a relevant sector of the exhibition sector (Blanco-González et al., 2012). These trade shows are considered to be of social and cultural value (Coca, 2001; Prado et al., 2012; Prado-Román et al., 2012). In 2009, world-wide sales in the art sector were over 31 billion euros (McAndrew, 2010). Trade shows and auctions are the principal channels of distribution for this sector (McAndrew, 2010).

There are a lot of theoretical and empirical research analyzing the trade show sector and its problems. Recently, the interest in trade shows has grown in line with the growth in their importance as a marketing tool. Research has been done into the objectives sought by exhibitors, the way to plan attendance, or strategic planning of trade shows (Gopalakrishna et al., 1995; Gopalakrishna & Lilien, 1995; Herbing et al., 1994; Lee & Kim, 2008; Smith et al., 2004, among others).

The present study develop a model which helps to measure the efficiency of exhibitors at art trade shows, and contrast it empirically by identifying the input and output which have greater impact on the efficiency of this type of exhibitors. Any organization must be based on control systems in order to optimize results (Bowlin et al., 1985). An organization is considered efficient when it achieves the set targets, using the fewest possible resources (Hao et al., 2000).

The objective here is to set up a model which, when applied, allows us to establish varying degrees of efficiency shown by the exhibitors at art trade show and which may be used to obtain relevant information for decision making. Analyzing efficiency is of use in orienting and guiding decision making and reveals aspects about organizations and their decisions which contribute to the act of reflection and taking decisions (Bowlin et al., 1985; Hao et al., 2000). The aim is not to show organizations a single way to act, but rather to provide useful diagnosis and help individuals to take decisions. In this case, analyzing exhibitors' efficiency at art trade shows is taken as an initial approach which could be of use not only to exhibitors but also to the organization of art trade shows in directing decision making.

The study is structured in four basic parts. Firstly, the pertinence of studying trade shows as a marketing tool is considered, and in particular the case of art trade shows. Secondly, the methodology used by DEA (Data Envelopment Analysis) and the proposed model of art exhibitors' efficiency is analyzed. The model is empirically applied to the exhibitors at ARCO International Art Trade Show (Madrid, 2009). In conclusion, the results obtained are analyzed in order to establish which exhibitors are more efficient, how they manage resources and what improvements may be applied to less efficient exhibitors to achieve maximum efficiency.

## **2. Theoretical framework**

From a marketing viewpoint, trade shows are an important tool for exhibiting and communicating what is offered as well as a means of building contacts and business with customers and many deals are struck (Ling-yee, 2007). This is all due to the presence of a public that is objective, attends in high numbers and of is high quality with a highly positive predisposition to the products exhibited. Communication is easily established and these customers often visit the exhibitor's different stands looking for information. These visitors are also extremely useful as a tool for market research, assessing competition and guiding future production lines (Kijewski et al., 1993; Kim, 2005; Munuera et al., 1995; Navarro, 2001; Sicilia, 2008; Shipley et al., 1993).

The companies, who wish to exhibit their products or services to real or potential customers, are homogeneous units with similar resources. They comply with the regulations imposed by the fair organizers, and have similar objectives such as direct sales, attracting new customers and contacts or to develop the company's brand image or prestige, among others (Munuera et al., 1995).

The extent to which exhibitors achieve their objectives must be measured (Kijewski et al., 1993; Ling-yee, 2007; Smith et al., 2004; or Tanner, 2002). The results may then be used in decision making. To do this it is necessary to find out how available resources may be reassigned from less to more efficient units; specific efficiency variations for each unit; monitor efficiency variations obtained over time; and identify units which may be rewarded for achieving good results. Measuring the efficiency at trade shows is not an easy task. For example, Stevens (2005) suggests measuring the number of new clients in relation to

goals, budget constraints, and booth attendance. Siskind (1997) observed that 57% of booth visitors make purchase decisions within the twelve months following the trade show.

This research selects the art sector because the art trade shows in Spain are very important around the world. Fairs such as ARCO or Feriarte have become important international events at the level of TEFAF (Maastricht) or the Basilea Fair (Switzerland). We must only consider the growth in the number of foreign exhibitors (Arco 2011: 122 International exhibitors and 75 Spanish exhibitors; 26 countries represented); and the toughening of requirements for exhibitors in compliance with international UFI standards focusing on six main areas: exhibitor quality, annual artistic programming, artistic standards, international recognition of the galleries, administrative and financial solvency, and assessment of their presence at international art trade shows.

### 3. Methodology

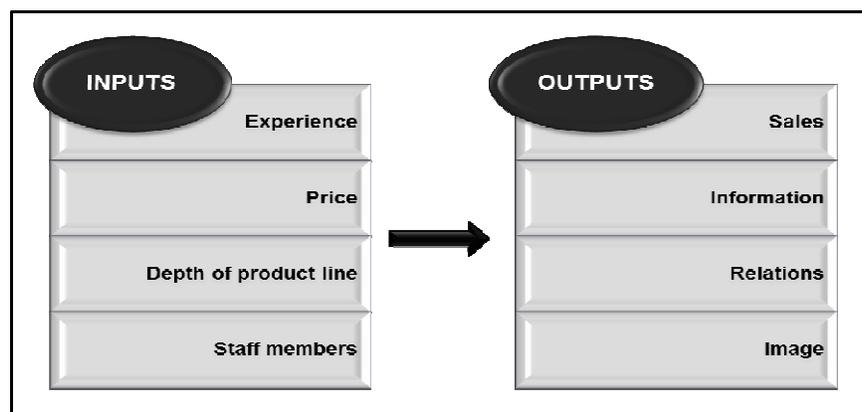
The main source of information (exhibitors), were consulted to gather their perception. The methodology used to obtain information was a structured questionnaire, divided in seven parts with questions regarding the achievement of set objectives.

ARCO 2009 was the trade show chosen to empirically apply the proposed theoretical model for several reasons. Besides international art fairs such as ARCO, it is one of the most important art trade show in Spain and Europe. Contemporary Art is garnering more widespread recognition and diffusion, largely thanks to the cultural programme ARCO has organised over the last twenty years. ARCO is a meeting place for the art world, a place for exchanging views, popularising contemporary art, consolidating art collecting and reinforcing the contemporary art market in Spain.

In order to study the efficiency of the exhibitors at art fairs, we have developed an efficiency model based on DEA (Data Envelopment Analysis). This is a technique for measuring efficiency based on lineal programming, and is specialized in measuring efficiency in productive units or decision making units (Alonso et al., 2009).

The model developed proposes using four indicators to measure inputs and four indicators for outputs. The input indicators measure the resources used by the exhibitors to obtain the results or outputs. The input indicators are the following: experience, price (cheap or expensive with relation their budget), depth of product line and number of stand members. Four indicators are used to measure outputs: sales, information, relations and image. In this way the exhibitors may be considered a homogeneous group despite differences in the products offered. In order to establish a suitable dimension the rules by Golany and Roll (1989), Charnes et al. (1994) were used, obtaining sufficient dimensionality in the models for the three rules.

Figure 1. Efficiency model for ARCO exhibitors



Source: Own design

The initial sample was made up of all the exhibitors who responded correctly to the survey on inputs and outputs obtained during the trade show. It consisted in a total of 59 selected units. Of these, 4 units were excluded as they presented atypical data or because they had not responded correctly. Efficiency was also analyzed in 54 exhibitors belonging to the same sector, i.e. art of different types (painting, photography or sculpture).

#### 4. Results

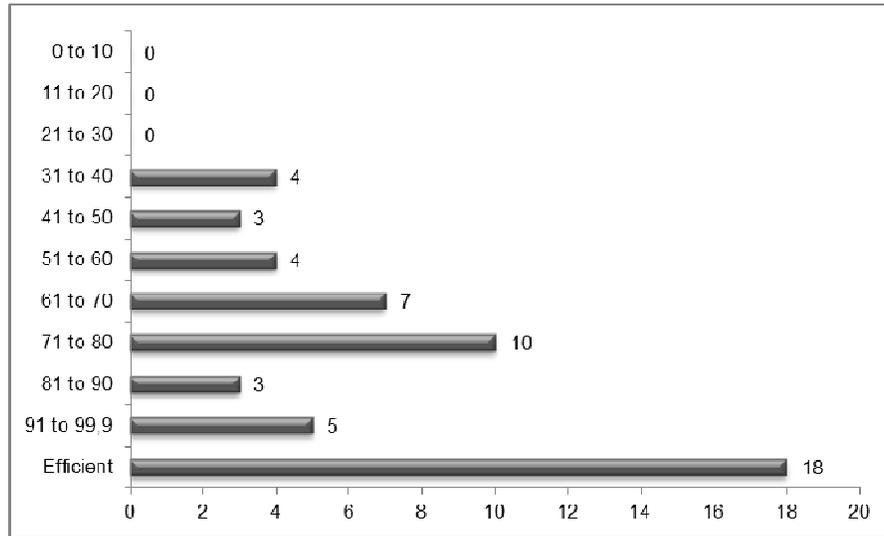
When the proposed methodology was applied, a degree of efficiency was obtained for each of the exhibitors, according to the input and output proposed in the model. The results obtained are from an output aspect and the final aim is to maximize output. This Table 1 shows the efficiency results for ARCO exhibitors.

Table 1. Efficiency Results for ARCO exhibitors

No.	Unit	Degree of Efficiency	No.	Unit	Degree of Efficiency	No.	Unit	Degree of Efficiency
1	Exhibitor 22	100,00%	19	Exhibitor 26	99,47%	37	Exhibitor 55	67,48%
2	Exhibitor 37	100,00%	20	Exhibitor 34	96,15%	38	Exhibitor 31	67,04%
3	Exhibitor 12	100,00%	21	Exhibitor 24	93,27%	39	Exhibitor 51	66,67%
4	Exhibitor 11	100,00%	22	Exhibitor 45	91,41%	40	Exhibitor 56	63,12%
5	Exhibitor 21	100,00%	23	Exhibitor 6	91,16%	41	Exhibitor 39	62,25%
6	Exhibitor 23	100,00%	24	Exhibitor 29	89,92%	42	Exhibitor 40	62,23%
7	Exhibitor 25	100,00%	25	Exhibitor 38	86,42%	43	Exhibitor 28	61,59%
8	Exhibitor 59	100,00%	26	Exhibitor 27	84,06%	44	Exhibitor 50	58,95%
9	Exhibitor 35	100,00%	27	Exhibitor 18	77,78%	45	Exhibitor 4	58,89%
10	Exhibitor 14	100,00%	28	Exhibitor 05	77,78%	46	Exhibitor 53	57,10%
11	Exhibitor 03	100,00%	29	Exhibitor 33	77,30%	47	Exhibitor 47	56,46%
12	Exhibitor 57	100,00%	30	Exhibitor 19	75,66%	48	Exhibitor 52	50,00%
13	Exhibitor 01	100,00%	31	Exhibitor 15	75,00%	49	Exhibitor 60	42,92%
14	Exhibitor 08	100,00%	32	Exhibitor 07	75,00%	50	Exhibitor 43	40,47%
15	Exhibitor 20	100,00%	33	Exhibitor 32	73,38%	51	Exhibitor 36	38,03%
16	Exhibitor 02	100,00%	34	Exhibitor 42	72,58%	52	Exhibitor 48	36,91%
17	Exhibitor 17	100,00%	35	Exhibitor 30	72,16%	53	Exhibitor 44	33,82%
18	Exhibitor 54	100,00%	36	Exhibitor 16	71,87%	54	Exhibitor 13	30,56%

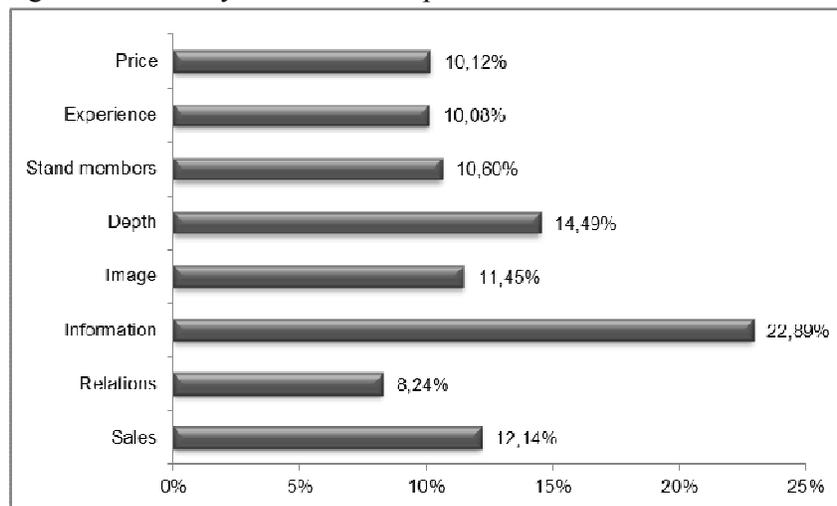
Figure 2, we may see the distribution of the efficiency results of the exhibitors studied. Results show that 18 units were 100% efficient and 36 units have a varying degree of efficiency between 11% and 99%, giving rise to great disparity, while among the most efficient exhibitors 10 had a degree of efficiency between 71 and 80% and there are 7 units with an efficiency level of less than 50%. Once the exhibitors had been classified into efficient and non-efficient, it was attempted to establish what action should be taken by each of the lesser efficient units to reach the efficiency barrier and become 100% efficient.

Figure 2. Distribution of results for exhibitors at ARCO



From an output aspect, the less efficient units could improve their efficiency by increasing their outputs while maintaining the number of resources used to generate them. The summary of potential improvements which may be implemented is shown in Figure 3, and reflects an overall need for the exhibitors to increase information output by 22%, sales turnover by 12,14%, image by 11,45% and relations by 8,24%. Exhibitors should not overlook the fact that some resources should be reduced compared with more efficient exhibitors, such as depth of product line.

Figure 3. Summary of Potential Improvements for Exhibitors at ARCO



## 5. Conclusions and implications for future research

The present study develop a model which helps to measure the efficiency of exhibitors at art trade shows, and contrast it empirically by identifying the input and output which have greater impact on the efficiency of this type of exhibitors. Any organization must be based on control systems in order to optimize results (Bowlin et al., 1985; Hao et al., 2000). In this research an efficiency analysis has been developed for exhibitors at ARCO art trade show, based on the non-parametric technique of DEA following Golany and Roll's systematization (1989).

It has been attempted to reflect the complex reality of art exhibitors by building indicators, which are basic in order to give an explanation of the reality where they apply. However, they may also be used in a model with great demands, so that by reading each one of the indicators explains the real meaning of each of the results obtained. Eight indicators have been used in the model proposed, four in reference to inputs and four in reference to outputs. The input indicators are: experience, price (cheap or expensive with relation their budget), depth of product line and number of stand member. The output indicators are: sales, information, relations and image.

The results confirmed, firstly, a great disparity has been shown to exist in the efficiency reached by exhibitors, and improvements may be introduced in this respect. Although some exhibitors obtain high efficiency results, more than half the exhibitors at ARCO show a poor assignment of resources, with much lower efficiency results (90%) than the most efficient exhibitors. Secondly, the results obtained show that, with the resources available, and compared with the way more efficient exhibitors utilize them. It is necessary to increase information (22%), sales (12,14%), image (11,45%) and relations (8,24%).

It seems that decisions about resource assignment and production by the exhibitors at art trade shows should not be based only on efficiency analysis, as this type of analysis is a guide that aids decision making but is never to be forcefully implemented (Hao et al., 2000). Even when a margin of error is applied, the results of the analysis are solid and lead to the inclusion of great improvements especially in winning clients (Bowlin et al., 1985).

This study may be considered a guide. Although the analysis has a mathematical base, no exact conclusions can be drawn as the data lacks sufficient rigour and the information was obtained at a specific moment in time. Although these methods provide useful diagnostic information, it would be unsuitable to entirely base business decisions regarding capital and resources exclusively on these results. Efficiency analysis may be used as a guide for decision making but never as irrefutable value judgements.

Future lines of research will have to study larger groups of exhibitors, preferably at different art trade shows. The use of a different methodology will illuminate other aspects of efficiency. It would be interesting to observe the results produced by qualitative techniques such as in-depth interviews or case studies. The model itself could and should be modified to include different inputs-outputs. Finally, these studies should be put in context by performing cross-sector comparisons.

## References

- Alonso, M.I.; Fernández, M.; & González, M. (2009). •Análisis de Eficiencia en el Sistema Hotelero Español: una Aplicación al Caso de Sol Meliá, *Investigaciones Europeas de Dirección y Economía de la Empresa*, 15(3), 83–99.
- Blanco-González, A.; Martín-Armario, E.; & Mercado-Idoeta, C. (2012). Collectors' Buying Behavior: A Model Based On Attitudes and Market Heterogeneity, *American International Journal of Contemporary Research*, 2(6), 164-175.
- Blythe, J. (2002). Using Trade Fairs in Key Account Management. *Industrial Marketing Management*, 31 (7), 627-635.

- Bowlin, W.F.; Charnes, A.; Cooper, W. W.; & Sherman, H.D. (1985). Data Envelopment Analysis and Regression Approaches to Efficiency Estimation and Evaluation, *Annals of Operations Research*, 2, 113-118.
- Charnes, A., Cooper, W., & Rhodes, E. (1978). Measuring the Efficiency of Decision Making Units”, *European Journal of Operational Research*, 2, 429 – 444.
- Coca, J.L. (2001). La Inversión en Filatelia: Organización del Mercado y Agentes Participantes. *Revista Europea de Dirección y Economía de la Empresa*, 10 (4), 21-28.
- Golany, R.; & Roll, Y. (1989). An Application Procedure for DEA, *International Journal of Management Science*, 17 (3), 237-250.
- Gopalakrishna, S., & Lilien, G. L (1995). A Three-Stage Model of Industrial Trade Show Performance. *Marketing Science*, 14 (1), 22-43.
- Gopalakrishna, S., Lilien, G. L., Williams, J. D., & Sequeira, I. K. (1995). Do Trade Shows Pay Off? *Journal of Marketing*, 59 (3), 75–83.
- Hao, G.; Wei, Q. L.; & Yan, H. (2000). A Game Theoretical Model of DEA Efficiency, *Journal of the Operational Research Society*, 51, pp. 1319-1329.
- Herbing, P., O'Hara, B. & Palumbo, F. (1994). Measuring Trade Show Effectiveness: An Effective Exercise? *Industrial Marketing Management*, 23 (2), 165-170.
- Jimenez, J.F.; Cazorla, I.M., & Linares, E. (2002). Ferias Comerciales en España. Un análisis sectorial, *Distribución y Consumo*, 61, 61-71.
- Kijewski, V., Yoon, E., & Young, G. (1993). How Exhibitors Select Trade Shows. *Industrial Marketing Management*, 22 (4), 287-298.
- Kim, Y.K. (2005). Korean Exhibitor's Behaviour in Overseas Exhibitions. *UNLV Journal of Hospitality, Tourism, & Leisure Science*, 1, 1-18.
- Lee, C.H., & Kim, S.Y. (2008). Differential Effects of Determinants on Multi-Dimensions of Trade Show Performance by Three Stages of Pre-Show, At-Show, and Post-Show activities. *Industrial Marketing Management*, 37 (7), 784-796.
- Ling-Yee, Li (2007). Marketing Resources and Performance of Exhibitor Firms in Trade Shows: A Contingent Resource Perspective. *Industrial Marketing Management*, 36 (3), 360–370.
- McAndrew, C. (2010). *The International Art Market, a Survey of Europe in a Global Context*. Maastricht: The European Fine Art Foundation.
- Munuera, J.L., Hernández, M., & Ruiz, M. (1995). Planificación de las Ferias como Actividades de Marketing, *ESIC Market*, 87, 9-30.
- Navarro (2001). *Estrategias de Marketing ferial*. Madrid: ESIC Editorial.
- Prado, C.; Coca, J.L.; & García, P. (2012). Aplicación de la Teoría de Carteras con Activos Numismáticos y Metales Preciosos, *Cuadernos de Gestión*, 12(1), 123-143.
- Prado-Román, C.; Blanco-González, A.; & Díez-Martín, F. (2012). Goal-Setting and Satisfaction among Exhibitors at Art and Collectibles International Trade Shows, *International Network of Business & Management Journals Conference Annual Meeting*, Valencia, Spain.
- Shipley, D., Egan, C., & Wong, K. S. (1993). Exhibiting Strategy and Implementation. *International Journal of Advertising*, 12 (2), 117-130.
- Sicilia, M. (2008). Análisis de las Decisiones del Expositor Ferial e Influencia en los Resultados Obtenidos. *Información Comercial Española: Revista de Economía*, 840, 73-92.
- Siskind, B (1997). *The Power of Exhibit Marketing* (4th ed.). Bellingham, WA: Self-Counsel Press.
- Smith, T. M., Gopalakrishna, S., & Smith, P.M. (2004). The Complementary Effect of Trade Show Attendance on Personal Selling. *International journal of research in Marketing*, 21 (1), 61-76.

- Stevens, R. P. (2005). *Trade Show and Event Marketing: Plan, Promote and Profit*. Toronto, Canada: Thompson/SouthWestern.
- Tanner, J. F., Jr. (2002). Levelling the Playing Field: Factors Influencing Trade Show Success for Small Companies. *Industrial Marketing Management*, 31 (3), 229-239.