



Environmental Certification and Financial Performance in Road Passenger Transport Companies: A Comparative Analysis

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Abstract: This research examines the relationship between environmental certification and the financial performance of road passenger transport companies during the period from 2010 to 2019. Through a comparative analysis of certified and non-certified companies, key financial ratios including return on assets (ROA), asset turnover (AT), net operating income per employee (NOIPE), and revenue growth (RG) are evaluated. The findings indicate that certified companies consistently outperform their non-certified counterparts in terms of profitability, revenue growth, and employee productivity. These results suggest that the implementation of environmental certifications can enhance competitiveness and financial outcomes, supporting the notion that environmental regulations can benefit both companies and society. It is anticipated that these findings will guide policymakers and managers in the transport sector towards more sustainable practices.

1. INTRODUCTION

The mobility of people and goods is essential for global economic development, with road transport being the most utilised means (Eurostat, 2021). However, this mode of transport has a negative impact on the environment and public health, particularly in urban areas. For this reason, both public institutions and private organisations, as well as other stakeholders, are exerting increasing pressure on policymakers to establish stricter environmental regulations on road passenger transport companies to adopt more sustainable practices. Nevertheless, investment in more efficient and sustainable technology should not be viewed as an obstacle but as an opportunity to yield substantial benefits. As posited by the Porter hypothesis (Porter & van der Linde, 1995), environmental regulations can facilitate a “win-win” scenario whereby, in addition to societal and environmental improvements, companies can also achieve greater economic benefits by gaining competitive advantages through both differentiation and cost reduction (Hagmann et al., 2015; Phillips et al., 2019).

In this context, environmental management system certification is a widely adopted tool in RPTCs for managing their environmental responsibilities (Kovac et al., 2020). The effective adoption of certification could lead to an increase in financial profitability, stemming from internal operational improvements within the organisation, enhanced employee efficiency, investment in sustainable assets, and ultimately, savings in resources and costs (Abdallah, 2017; Phillips et al., 2019). Furthermore, certification would enhance the company’s image and reputation, as it is perceived by customers as an indicator of environmental commitment, attracting clientele and consequently leading to higher sales (Iatridis & Kesidou, 2016).

Despite the growing importance of environmental commitment in road passenger transport companies, the literature addressing its relationship with financial profitability remains limited (Fernández

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Vázquez-Noguerol et al., 2018). This study aims to contribute to the expansion of research in this area by comparing the financial performance of certified and non-certified private road passenger transport companies between 2010 and 2019. Through a descriptive analysis, differences in key profitability indicators will be examined, along with aspects such as users' environmental perception, sustainable asset management, and employees' ecological behaviour in both types of companies. The results will guide decision-making on environmental policies for both public officials and sector managers.

2. THEORETICAL FRAME

To be a developed country, it is essential to have an evolved transport system that meets the needs of businesses and individuals. Indeed, in economic terms, in 2021, the transport sector accounted for approximately 5% of GDP and 5.36% of employment in Europe (Eurostat, 2021). In this regard, among the various modes of transport, road transport plays a pivotal economic role, as it facilitates the movement of the largest number of goods and passengers (Fernández Vázquez-Noguerol et al., 2018). According to Eurostat, nearly half of all transport was conducted by road (Eurostat, 2021).

However, road transport is one of the sectors with the most significant negative impact on the environment (Osietrin et al., 2015). In addition to being one of the main CO₂ emitters, accounting for 23% in 2021 (World Bank, 2021), it is a source of air, noise, and thermal pollution, leading to environmental degradation (Huang et al., 2018). This situation is projected to deteriorate further with continued economic and population growth (World Bank, 2021).

In light of this scenario, it is essential, as recommended by the European Union and the United Nations General Assembly, to develop a public transport system that meets mobility needs while minimising negative environmental impacts. In this regard, as warned by the United Nations General Assembly, the sustainability of the sector must consider economic, social, and environmental aspects (United Nations, 2015).

Given its significance, the evaluation of sustainability performance in the transport sector, from social, economic, and environmental dimensions, has attracted the attention of researchers, particularly in the environmental domain (Kumar & Anbanandam, 2020). Studies have explored environmental actions and policies in regions such as Asia, the European Union, and OECD countries, as well as emissions from various modes of transport and strategies to mitigate their environmental impact. Measures such as vehicle energy efficiency, transport and distribution management, the use of alternative fuels, and the promotion of integrated and alternative transport modes have been analysed.

However, the attention given to the economic and social dimensions has been limited (Fernández Vázquez-Noguerol et al., 2018). From an economic perspective, studies have examined transport costs and prices, as well as the economic effects of environmental actions. With a focus on the social dimension, research has addressed issues such as risks and safety, equity, and the promotion of best practices.

The interconnection between the environmental, economic, and social dimensions is evident. According to Porter and van der Linde (1995), a mutually beneficial situation can be achieved across all three dimensions. In the social realm, efforts directed towards sustainable transport translate into improvements in public health and quality of life. Moreover, these efforts will not only contribute to reducing negative environmental impacts but will also enable institutional savings and enhance the profitability of transport companies, as highlighted by various studies (Oberhofer & Dieplinger, 2014).

Consequently, environmental management can serve as a valuable differentiation strategy in the road passenger transport sector. To this end, the certification of Environmental Management Systems (EMS) by international verification bodies is among the most widely adopted measures worldwide. According to [Abdallah \(2017\)](#), environmental certification ensures an effective environmental management system. The greater the ecological efficiency of a company, the higher the likelihood of adopting such certification. Many transport companies have successfully managed their environmental responsibilities through this certification, which allows them to improve their environmental management ([Kovac et al., 2020](#)).

Moreover, environmental certification aids transport companies in differentiating themselves from their competitors, achieving customer acceptance and social legitimacy, thereby enhancing their image and reputation. This can enhance customer satisfaction and loyalty, potentially influencing passenger attitudes and decisions, thereby driving increased demand and sales ([Hagmann et al., 2015](#)).

Environmental certification also leads to internal operational improvements and personnel enhancements, allowing for cost reductions and the attainment of competitive advantages ([Kovac et al., 2020](#)). This process fosters continuous improvement that positively affects operational efficiency. Environmental certification necessitates internal assessments regarding resource usage and the adoption of environmental management techniques aimed at reducing negative impacts. Environmental awareness among employees can enhance their performance, and investments in technology and sustainable management can optimise operations and reduce resource consumption ([Phillips et al., 2019](#)).

Despite the importance of these factors, studies analysing the effects of environmental management on the financial profitability of passenger transport companies are limited. Thus, this document aims to expand the research on the relationship between environmental management and financial profitability. In this analysis, environmental certification based on international standards and verified by external bodies is employed as an indicator of the environmental proactivity of transport companies. While various indicators can measure environmental proactivity, certification is widely recognised in the literature as a reliable tool for this purpose ([Cavero-Rubio & Amorós-Martínez, 2020](#)). This choice minimises bias associated with the lack of an objective, standardised variable, thereby improving the reliability and comparability of the study.

In addition to examining the relationship between environmental certification and financial performance, the study also addresses the analysis of variables such as the green image of passengers, sustainable asset management, and the ecological performance of employees. This approach provides a broader perspective on how environmental certification may influence various factors, which, in turn, can contribute to the financial performance of passenger transport companies.

It is important to note that the environmental behaviour of transport companies is also conditioned by their individual characteristics. For instance, internationally operating companies often exhibit greater ecological responsibility. Therefore, as indicated by [Oberhofer and Dieplinger \(2014\)](#), one variable that significantly influences the implementation of environmental measures is whether the company operates on international routes. Similarly, the formation of groups or alliances among transport companies appears to have a positive impact, as such collaborations tend to foster better environmental performance.

Lastly, it is pertinent to consider the type of service offered by transport companies. In Spain, tourism is the most significant sector of the economy ([World Travel & Tourism Council, 2021](#)),

and discretionary tourist transport is the service that mobilises the most passengers, far surpassing other types of transport, such as school or healthcare transport (KPMG, 2021). Given the economic significance of coastal tourism for PRPTCs, these companies are likely to prioritise environmental certifications and sustainable practices. Institutional pressures to protect the natural environment, critical for maintaining coastal tourism's appeal, further drive these efforts.

3. METHODOLOGY AND DATA

The study sample consists of private discretionary passenger road transport companies (PRPTCs) for the period 2009-2019. This period is sufficiently extensive for a longitudinal study, avoiding distortions caused by the COVID-19 pandemic. The selection of companies was conducted in two stages. First, the Iberian Balance Sheet Analysis System database was used to identify 297 PRPTCs that met the criteria of having complete financial data. Second, it was verified whether these companies were certified under the ISO 14001 standard. Records from certification bodies such as AENOR, Bureau Veritas, TÜV Rheinland Ibérica Inspection, Certification & Testing, S.A. and SGS ICS Ibérica, S.A. were consulted to confirm certification. In some cases, direct contact was also made with the PRPTCs in order to verify their certification status. The final sample was divided into two groups: 90 certified PRPTCs (990 observations) and 207 non-certified ones (2,277 observations).

In order to determine whether the effect of an EMS certification on an PRPTCs' financial performance is mediated by two pathways: firstly, on the efficiency with which assets and employees are utilised, and secondly, on the environmental image perceived by passengers.

Based on previous literature, the most indicative and stable indicator used by many researchers to measure companies' financial profitability is the Return on Assets (ROA). According to [Cave-ro-Rubio and Amorós-Martínez \(2020\)](#), ROA is the commonly used variable to measure financial performance in environmental management research.

In line with [Noh \(2019\)](#), Asset Turnover (AT) was selected as the most appropriate indicator for quantifying the impact of certification on sustainable asset management. Investment in sustainable assets would result in cost reductions and increased asset returns.

Research also suggests that environmental management can enhance employees' ecological behaviour, leading to improved performance. [Prajogo et al. \(2014\)](#) identified net operating income per employee (NOIPE) as a relevant ratio for quantifying employee performance.

Finally, it is reasonable to propose that obtaining environmental certification could improve passengers' environmental perception of PRPTCs, thereby increasing their preference for certified companies and, consequently, the sales revenue of these companies. For this reason, and in line with the approach taken by [Wang and Lin \(2022\)](#), revenue growth (RG) was chosen as the representative variable to quantify the effect of environmental certification on passengers' decision making when choosing PRPTCs.

Table 1 defines the four variables in question. It sets out ROA as the dependent variable and AT, NOIPE, and RG as independent or explanatory variables for ROA.

Table 2 presents the number of observations and certified and non-certified for classifications made according to defined individual characteristics: companies operating internationally, those belonging to a group or alliance (GROUP) and those operating in coastal areas (COAST).

Table 1. Variables Analysed

Variable	Description	Abbreviation
Return on assets	Earnings Before Interest and Taxes/Total assets	ROA
Revenue growth	$(\text{Revenues year}^t - \text{Revenues year}^{t-1})/(\text{Revenues year}^{t-1})$	RG
Asset turnover	Revenues/Total assets	AT
Net operating income per employee	Net operating income/Number of employees	NOIPE

Source: Own processing

Table 2. Distribution of road passenger transport companies in the sample

Variables		CERT		NoCERT		Total	
		Observations (PRPTC)	%	Observations (PRPTC)	%	Observations (PRPTC)	%
INT	Yes	429(39)	43.33%	803(73)	35.27%	1,232(112)	37.71%
	No	561(51)	56.67%	1,474(134)	64.73%	2,035(185)	62.29%
GROUP	Yes	539(49)	54.44%	979(89)	43.00%	1,518(138)	46.46%
	No	451(41)	45.56%	1,298(118)	57.00%	1,749(159)	53.54%
COAST	Yes	363(33)	36.67%	715(65)	31.40%	1,078(98)	33.00%
	No	627(57)	63.33%	1,562(142)	68.60%	2,189(199)	67.00%
POOLED SAMPLE		990(90)	100.00%	2,277(207)	100.00%	3,267(297)	100.00%

Source: Own processing

In order to calculate the ratios for each PRPTC, the financial statements from the Iberian Balance Sheet Analysis System database were employed. The statistical analysis of these ratios was conducted using the SPSS 28.0 software. A normality test (Kolmogorov-Smirnov) was performed to assess data distribution. As the results indicated that the data followed a normal distribution, a Student's t-test was employed to compare the means of selected variables between certified and non-certified PRPTCs, as well as across different groups defined by individual characteristics: companies operating internationally, companies belonging to groups or alliances, and those operating in coastal areas. This approach enabled the identification of significant differences in financial indicators, providing a solid basis for understanding the role of environmental certification in PRPTCs' performance over the analysed period.

4. RESULTS AND DISCUSSION

Table 3 presents the median, mean, and standard deviation values for all certified (CERT) and non-certified (NoCERT) PRPTCs, as well as for each grouping based on the individual characteristics of each company. Furthermore, it presents the differences in means and the statistical significance results from the Student's t-test.

As evidenced by the findings of the analysis of the grouped sample, PRPTCs certified with ISO 14001 demonstrate on average superior financial performance compared to non-certified PRPTCs over the analysed period. These findings support the proposition that environmental certification can be a significant determinant of enhanced business profitability, as suggested by previous literature (Phillips et al., 2019; Hagmann et al., 2015).

Table 3. Descriptive statistics. Mean Differences. Student-t test

			CERT			NoCERT			Difference Student-t test
Variables		Ratio	Mean	Median	Std. dev.	Mean	Median	Std. dev.	
		ROA	4.98%	4.30%	4.70%	4.37%	4.03%	4.03%	0.60%*
	Yes	RG	1.92%	1.25%	9.54%	1.22%	0.54%	9.25%	0.70%***
		NOIPE	4,879.28	3,406.31	5,695.93	4,019.29	3,350.12	4,415.17	859.99*
		AT	0.890	0.880	0.298	0.909	0.859	0.332	-0.019*
INT		ROA	5.07%	4.02%	4.71%	4.33%	3.68%	4.06%	0.74%*
	No	RG	2.74%	2.66%	9.42%	1.82%	1.35%	9.49%	0.92%**
		NOIPE	5,297.25	4,313.19	5,497.80	4,039.46	3,244.33	4,467.77	1,257.79*
		AT	0.793	0.745	0.259	0.867	0.840	0.325	-0.074
		ROA	5.29%	4.26%	4.68%	4.28%	3.73%	4.10%	1.01%*
	Yes	RG	2.13%	1.55%	8.89%	1.51%	1.05%	9.35%	0.62%***
		NOIPE	5,677.70	4,346.58	5,825.85	4,146.24	3,448.68	4,786.51	1,531.45*
		AT	0.803	0.755	0.279	0.885	0.849	0.356	-0.082*
GROUP		ROA	4.73%	3.93%	4.71%	4.40%	3.88%	4.01%	0.33%***
	No	RG	2.47%	2.29%	10.19%	1.73%	1.20%	9.45%	0.74%***
		NOIPE	4,499.83	3,283.82	5,257.97	3,950.08	3,163.53	4,187.19	549.75**
		AT	0.872	0.836	0.277	0.879	0.841	0.306	-0.007
		ROA	4.90%	4.27%	4.24%	4.09%	3.51%	4.13%	0.81%*
	Yes	RG	2.00%	2.33%	9.68%	1.36%	1.19%	9.58%	0.64%***
		NOIPE	5,017.93	4,332.61	5,075.12	3,839.36	2,933.92	4,591.96	1,178.57*
		AT	0.802	0.760	0.259	0.912	0.854	0.360	-0.110*
COAST		ROA	5.11%	4.05%	4.95%	4.47%	4.02%	4.01%	0.64%*
	No	RG	2.45%	1.48%	9.40%	1.76%	1.14%	9.33%	0.69%***
		NOIPE	5,166.93	3,748.03	5,879.98	4,120.08	3,461.14	4,379.46	1,046.85*
		AT	0.854	0.817	0.290	0.868	0.841	0.312	-0.015
		ROA	5.03%	4.10%	4.70%	4.35%	3.81%	4.05%	0.68%*
POOLED SAMPLE		RG	2.29%	1.90%	9.50%	1.64%	1.15%	9.41%	0.65%**
		NOIPE	5,110.77	3,923.70	5,587.84	4,032.20	3,274.58	4,447.88	1,078.57*
		AT	0.835	0.796	0.882	0.882	0.845	0.328	-0.047*

*p < 0.01; **p < 0.05; ***p < 0.1

Source: Own calculations

With regard to return on assets (ROA), certified companies demonstrate an average of 5.03%, which is markedly higher than the 4.35% exhibited by non-certified companies ($p < 0.01$). This result corroborates the assertion put forth by Porter and van der Linde (1995) that environmental regulations, rather than being a burden, can serve to enhance operational efficiency and thereby improve profitability. The implementation of environmental certification promotes more efficient utilisation of resources, which can subsequently enhance the profitability of certified companies (Abdallah, 2017).

Revenue Growth (RG) is another indicator in which certified companies significantly outperform non-certified ones. Certified PRPTCs show an average RG of 2.29%, compared to 1.64% for non-certified companies ($p < 0.05$). This outcome is consistent with the findings of Iatridis and Kesidou (2016), who posit that environmental certification can enhance a company's image and reputation, attracting a larger consumer base with heightened environmental awareness.

The Net Operating Income per Employee (NOIPE) also exhibits a higher and statistically significant mean for certified companies. This result, in line with [Prajogo et al. \(2014\)](#), suggests that sustainable practices, not only contribute to a company's financial profitability but also enhance individual employee productivity. ISO 14001 certification likely fosters greater employee awareness regarding environmental practices, leading to improved performance.

The Asset Turnover (AT) indicator is the only one slightly lower for certified companies, with an average of 0.835 compared to 0.882 for non-certified companies. Although the difference is slight, it is statistically significant ($p < 0.01$), indicating that certified companies, while exhibiting greater profitability, may be employing a more conservative approach to asset utilisation. This may be attributed to the fact that investment in sustainable assets may necessitate higher initial costs, which could ultimately yield long-term benefits ([Noh, 2019](#)).

Upon analysing subgroups of companies according to their individual characteristics, similar patterns to those in the grouped sample are observed, albeit with some interesting variations. PRPTCs operating internationally exhibit even more pronounced differences between certified and non-certified companies. The mean return on assets (ROA) for certified companies is 5.07%, while non-certified companies have a ROA of 4.33%, with a statistically significant difference ($p < 0.01$). This lends support to the assertion put forth by [Delmas and Toffel \(2004\)](#) that companies with international operations tend to demonstrate greater ecological responsibility as a result of heightened regulatory pressure and enhanced global visibility. Moreover, the NOIPE is markedly higher in certified companies, suggesting that these organisations, in addition to being more profitable, also manage their human capital more effectively.

For PRPTCs belonging to groups or alliances, the certified companies also exhibit a higher average ROA than their non-certified counterparts, with a notable difference of 1.01 percentage points ($p < 0.01$). It appears that group membership serves to enhance the benefits derived from certification. This may be attributed to the fact that alliances facilitate the exchange of optimal environmental practices ([Oberhofer & Fürst, 2012](#)). Similarly, NOIPE is markedly higher for certified companies, thereby reinforcing the significance of environmental practices in labour efficiency within grouped companies.

Finally, there are notable differences in the performance of PRPTCs operating in coastal areas. The mean ROA for certified companies is 5.11%, in comparison to 4.47% for non-certified companies ($p < 0.01$). Furthermore, RG is markedly higher for certified companies (2.45% compared to 1.76%), indicating that certification may assist in attracting a greater number of environmentally conscious tourists, thereby increasing sales and, ultimately, profitability.

5. FUTURE RESEARCH DIRECTIONS

This study opens various avenues for future research. One avenue for further research would be to conduct a more detailed analysis through regression studies, which would allow for a more precise identification of the key variables explaining the relationship between environmental certification and financial profitability. Using econometric models would facilitate the examination of the isolated impact of certification on companies' principal financial indicators.

Furthermore, additional research could investigate the role of environmental certification in attracting investors and its correlation with the cost of capital. Certification could influence investor perceptions, fostering greater confidence and more favourable financing conditions for certified companies.

Finally, it would be beneficial to examine the influence of public policies and government incentives on the adoption of environmental certifications. Future research could analyse how regulation and subsidies influence companies' decisions to obtain certification. Additionally, examining how these measures impact financial performance could provide valuable insights for policymakers promoting sustainability in the transport sector.

6. CONCLUSION

This study has examined the relationship between environmental certification and financial profitability in private passenger road transport companies, providing empirical evidence on the benefits of ISO 14001 certification. The results show that certified companies exhibit superior financial performance in terms of return on assets, revenue growth, and operational efficiency, as measured by net operating income per employee.

These findings support the hypothesis that environmental regulations, rather than being a burden, contribute to the financial success of companies, benefiting both organisations and society. Environmental certification has been shown to be an effective tool for enhancing a company's image and reputation, optimising efficiency, and attracting a more environmentally conscious audience. The results provide an evidence base for future strategic decision-making at both the business management and public policy levels.

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