ECONOMICS OF SUSTAINABLE DEVELOPMENT
Vol. 8, july-december 2024, № 2
UDK 33+502/504
ISSN 2560-421X

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P. 1-19
SCIENTIFIC REVIEW PAPER
10.5937/ESD2402001M
Received: March 2, 2024
Accepted: April 29, 2024

# RELATIONS AMONG ENVIRONMENTAL AND FINANCIAL PERFORMANCE OF RESOURCE USAGE IN ENTERPRISES: LITERATURE REVIEW

**Abstract**

*The mutual influence and interdependence of financial performance (FP) of resource usage and environmental performance (EP) is an important research area, which has particularly occupied the attention of researchers in the last decade. Increasing requirements for environmental protection, principles of circular economy and regenerative economy create an obligation for the enterprise management regarding efficient and effective management of environmental aspects of business with the aim of sustainability and improvement of EP. In addition, stakeholders of the enterprise are interested in the economic effects of implemented environmental actions on FP. The results of the research dealing with the relations between different indicators of EP and FP of resource use are mixed. Bearing in mind the above, the purpose of this paper is to provide a summary of research on the impact of EP on the FP of resource use, FP of resource use on EP and the interdependence of FP of resource use and EP.*

***Keywords:*** *environmental performance, financial performance, impact, interdependence, enterprise*

***JEL classification:*** *Q5*

# РЕЛАЦИЈЕ ИЗМЕЂУ ЕКОЛОШКИХ И ФИНАНСИЈСКИХ ПЕРФОРМАНСИ УПОТРЕБЕ РЕСУРСА ПРЕДУЗЕЋА: ПРЕГЛЕД ЛИТЕРАТУРЕ

**Апстракт**

*Међусобни утицај и међузависност финансијских перформанси употребе ресурса, на једној страни и еколошких перформанси, на другој, представља важно истраживачко подручје, које посебно окупира пажњу истраживача у последњој деценији. Све већи захтеви за заштитом животне средине, принципи циркуларне економије и регенеративне економије, постављају пред менаџмен-*

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*том предузећа обавезу ефикасног и ефективног управљања еколошким аспектима пословања у циљу одрживости и унапређења еколошких перформанси. Осим тога, власници и остали стејкхолдери предузећа су заинтересовани за економске ефекте реализованих еколошких акција на финансијске перформансе. Резултати истраживања која се баве односима између различитих индикатора еколошких и финансијских перформанси употребе ресурса су различити. Имајући у виду наведено, сврха овог рада је да пружи сумарни приказ истраживања утицаја еколошких перфомански на финансијске перформансе употребе ресурса, финансијских перформанси употребе ресурса на еколошке перформансе и међузависности финансијских перформанси употребе ресурса и еколошких перформанси.*

***Кључне речи:*** *еколошке перформансе, финансијске перформансе, утицај, међузависност, предузеће*

## 1. Introduction

Business performance of an enterprise can be divided into three parts: resource performance, performance of resource usage and social responsibility performance (Krstić, 2022). Resource performance shows the characteristics and quality of resources in the enterprise, while performance of resource usage shows the economic success in using resources. While resource performance is mostly non-financial in nature, performance of resource usage is predominantly financial in nature, although it can also be non-financial (Bogićević et al, 2016). Social responsibility performance is related to the non-economic dimension of the enterprise's operations and includes: social responsibility performance, environmental performance (Krstić et al., 2021), performance of health and safety at work, and finally, ethical performance. They are mostly non-financial (Domanović et al., 2020).

Since the 1970s, the concept of circular economy has gained more and more importance. The initial development of the concept is attributed to Pearce and Turner, who in 1989 described how natural resources affect the economy. They focused on the importance of recycling, re-production, long-term design, repairs, maintenance, etc. (Geissdoerfer et al., 2017). The circular economy implies processes of production/consumption that maximize service based on the linear flow of materials and energy considering nature-society-nature relations. This is achieved by using cyclic flows of material and energy sources that can be characterized as renewable (Korhonen et al., 2018; Rakić et al, 2021). The principles on which the circular economy is based are: reciprocity, reduced use of resources, sustainability of design, innovative business models, transformation of consumption, inclusion of citizens in sustainability, coordination and participation in the process of change at multiple levels, promotion of different solutions used for the purpose implementing the principle of circularity, incorporating sustainability into political-economic systems and a holistic approach (Velenturf & Purnell, 2021).

Great social inequality, scarcity of resources, destruction of biodiversity, global warming and other climate changes have made the existing systems ineffective and have forced economic subjects to change. As a result, the development of regenerative systems and regenerative economy (BMW Foundation RESPOND, 2022), as a concept

that is related to the concept of circular economy, occurs. Regeneration is a process aimed at creating sustainable systems. Through the use of universal patterns and principles comes the creation of healthy and sustainable systems. Certain principles on which the regenerative economy is based are differentiated. The first principle emphasizes the existence of reciprocity, which implies a high degree of connection and conditioning of all actors and parts of the system. According to the second principle, the system is only as strong as the weakest part. The third one focuses on innovation and adaptation, as ways to survive concerning rivals. The fourth implies that the parts of the system must be connected, and that inclusiveness contributes to a better functioning of the system. The fifth emphasizes that a regenerative economy fosters healthy and resilient communities and regions, while maintaining uniqueness. The sixth talks about the limits of the system, according to which creativity is located at the edges of that system. Seventh, the focus directs to the importance of circularity, between all parts of the system. Finally, the eighth principle of the regenerative economy suggests the importance of the balance of the entire system (Capital Institute, 2023).

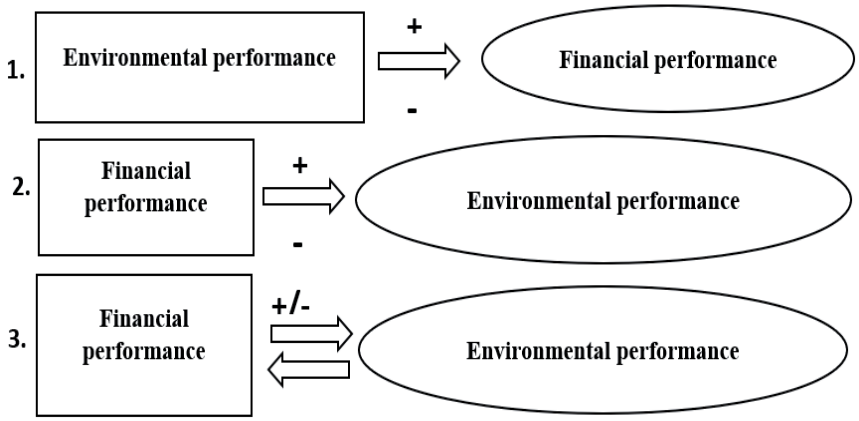
The concepts of circular and regenerative economy focus on monitoring and improving the EP of enterprises. EP represents measurable results in managing the environment. There are increasing demands on businesses to focus on improving this performance group. Requirements for standardization (ISO 9000 and ISO 14000) provide an opportunity to improve the market position and achieve competitiveness in relation to participants who do not respect the stated standards. Also, the regulations of certain countries, especially countries that belong to the European Union, require reporting on achieved EP, which encourages enterprises to manage them in the best possible way. Satisfying stakeholder interests is another reason for EP management (Purnomo & Widianingsih, 2012; Jovanović et al., 2013).

Environmental problems are becoming an increasingly topical issue. In addition to the demands for corporate social responsibility, consumer demand for the delivery of environmentally friendly products is also intensifying. Also, a large number of countries prescribe regulations in the field of managing the environmental aspect of business as well as the obligation to report on the achieved EP. Enterprises are faced with the dilemma of the impact of EP on FP (Miladiasari et al., 2021). The importance of EP management is also reflected when it comes to investment activity. In addition to considering financial results, investors often look at environmental practices and results, bearing in mind their impact on FP. In this way, they learn about the possibilities for development, but also possible problems and obstacles for the long-term business of the enterprise, on the basis of which they make the final investment decision (Sari & Sutopo, 2022).

In this paper, by reviewing and analysing the results (outcomes) of the relevant literature, it is examined the connection and influence of EP (emissions reduction, control of pollution, conservation of natural resources, publication of environmental data, environmental cost (EC), energy intensity, eco-efficiency, carbon emission (CE), sustainability reporting disclosure, corporate environmental reporting (CER), environmental accounting (EA), sustainability performance, sustainability performance disclosure, carbon intensity/emission, energy use, water/air/soil pollution, waste production) on FP of the use of resources (return on assets (ROA), return on equity (ROE), return on sales (ROS), return on investment (ROI), return on capital employed (ROCE), Tobin's Q, cash-flow/equity ratio (CF/E ratio), cash-flow/assets ratio (CF/A

ratio), earnings per share (EPS), profitability, earnings before interest and tax (EBIT), earnings before interest, tax and amortization (EBITA), liquidity, leverage, economic value added (EVA), market value/book value ratio (M/B ratio), sales growth, efficiency, income, cumulative return on shares). Then the influence of FP of the resource use on EP and finally the mutual influence of these performance groups are investigated. These relationships are presented in Figure 1.

Figure 1 Conceptual research framework of relationship between EP and FP of resource usage




*Source: Authors*

## 2. The impact of environmental performance on financial performance of resource usage

In the relevant literature, there is a group of researches that deal with indicators of the effects of reducing harmful emissions (environmental pollution) on the FP of resource usage (Table 1).

Accordingly, *Jaggi and Freedman (1992)* analysed the impact of pollution performance on FP - ROA, ROE, CF/E ratio and CF/A ratio. The pollution performance from 1978 and its effect on FP for the period 1975-1977 were analysed. The results showed that pollution performance has a weak negative relationship with ROE, then a medium negative relationship with ROA, as well as a strong negative relationship with CF/E ratio and CF/A ratio. A similar analysis was carried out by *Hart & Ahuja (1996)* on the example of Standard and Poor's 500 list of enterprises. A positive impact of emissions reduction (EMRED) on ROA, ROE and ROS was determined, except in the initial year of the research (1989). Also, *King & Lenox (2001)* proved a negative correlation between total emissions and Tobin's Q. They concluded that enterprises with reduced emissions improve financial results in the following year. *Ganda & Samson Milondzo (2018)* investigated the effect of CE on FP of enterprises (ROI, ROE, ROS) in South Africa, proving the negative impact of CE on the observed FP.

It can be concluded that all research from this group proved a negative relationship between the emissions of harmful gases of the enterprise (damage to the environment) and FP of resource usage (ROA, ROE, ROS, Tobin's Q).

The second group of studies deals with the analysis of various indicators of the EP of enterprises and their impact on the FP of resource usage.

*Salama (2005),* during the year 2000, showed that EP (waste management, good environmental reputation, implementation of environmental measures) has a positive impact on FPof resource usage (which leads to achieving a greater competitive advantage through maximizing shareholder's wealth, thereby achieving better financial results). Similarly, *Prayanthi & Mandagi (2015)* proved a positive impact of EP on ROA and ROE in a three-year period (2011-2013). The sample included only one enterprise in Indonesia. Also, *Haninun et al. (2018)* conducted research in the period 2009-2014. The analysis showed a significant positive relationship between environmental and FP of resource usage (ROA, ROE). In accordance with these researches are the following. *Kalash (2021)* conducted the research examining the impact of EP on ROA, ROE and operating profitability. A significant positive impact of environmental performance on all investigated FPs was determined. *Galant & Cvek (2021)* analysed the environmental impact on FP of the 150 largest enterprises in Croatia. The results of the research showed a positive and significant impact of EP on FP of the analysed enterprises. For research purposes, *Fauzi (2022)* proved that there is a positive influence of EP on FP (ROE and Tobin's Q), but also on the value of the enterprise. *Ramlawati et al. (2022)* suggested that there is a positive and significant impact of EP on ROE. Better quality in environmental management by enterprises, according to the research results, leads proportionally to an increase in ROE. And some recent research proved the positive impact of eco indicators on FP of enterprises. *Inalloa et al. (2023)* investigated the impact of EP indicators on FP. The environmental indicators used in the study included the following: control of pollution, environmental damage prevention, research, development and conservation of natural resources and the determinants of environmental policy. FP indicators used as dependent variables in the study included: ROA, ROE, ROS, book value, market value, residual profit and ROI. The research results showed a significant relationship between EP and FP, as well as a significant impact of environmental on FP of resource usage. *Naseer et al. (2023)* dealt with the analysis of the impact of EP on FP of resource usage (ROA, Tobin's Q, EPS). The research results implied the existence of a significant positive relationship.

*Angelia & Suryaningsih (2015)* analysed the influence of EP on ROA and ROE of enterprises divided into 5 groups (the best or first group includes enterprises that fully implement a sustainable business system and environmental management in the long term, while the worst group, i.e. the last one, does not respect the principles of environmental management, with the potential possibility of pollution and damage to the environment). They concluded that EP has a significant positive impact on ROA and ROE only for enterprises in the first group.

*Manrique & Martí-Ballester (2017)* investigated the influence of EP (reduction of emissions of harmful gases, hazardous waste, water use, impact on biodiversity, cooperation with environmental organizations) on FP of resource usage (ROA and Tobin's Q). They showed that there is a positive impact of EP on FP, with greater positive effects for enterprises from developing countries. The reason for this result is that enterprises located in developing

countries are most often in the initial stages of environmental activities, which allows them to achieve better results through the implementation of environmental activities. These activities are simple to implement, require a short period, achieving short-term profits while requiring low financial assets, and improving ROA.

Table 1 Systematization of research results on the influence of EP on FP of resource usage

| Research | Sample | Independent variable | Dependent variable | Correlation | Regression |
|---|---|---|---|---|---|
| | | | | Connection | Impact direction |
| *Jaggi & Freedman (1992)* | 13 enterprises in the USA (1975-1980) | *Pollution performance* | *ROA, ROE, CF/E ratio, CF/A ratio* | 1978 – No significant impact 1975-1977 - ROE (weak negative), ROA (medium negative), CF/E ratio (strong negative), CF/A ratio (strong negative) 1978-1980 – No significant impact | - |
| *Hart (1996)* | 127 enterprises in the USA (1989-1992) | *EMRED* | *ROA, ROE, ROS* | - | Positive |
| *King & Lenox (2001)* | 4483 manufacturing enterprises in the USA (1987-1996) | *Relative emissions, Industry emissions* | *Tobin's* Q | Relative (weak negative), Industry (No significant impact) | - |
| *Salama (2005)* | 201 enterprises in the UK (2000) | *CER* | *Cash-flow* | - | Positive |
| *Angelia & Suryaningsih (2015*) | 17 manufacturing, infrastructure and service enterprises in Indonesia (2012-2013) | *EP* | *ROA, ROE* | - | Positive |
| *Prayanthi & Mandagi (2015)* | 1 enterprise in Indonesia (2011-2013) | *EP* | *ROA, ROE* | - | Positive in 2012 and 2013; No significant impact in 2011 |
| *Md Nor et al. (2016*) | 100 enterprises in Malaysia (2011) | *Environmental disclosure* | *ROA, ROE, EPS, Profit margin* | ROA (strong negative), ROE (strong negative), EPS (weak positive), Profit margin (weak negative) | Positive |

| | | | | | |
|---|---|---|---|---|---|
| *Manrique & Martí-Ballester (2017)* | 2982 enterprises in developed and developing countries (2008-2015) | *CER* | *ROA, Tobin's Q* | - | Positive |
| *Maksum & Tamba (2017)* | 42 manufacturing enterprises in Indonesia (2012-2014) | *EP* | *ROA* | - | No significant impact |
| *Haninun et al. (2018)* | 108 enterprises from Indonesia stock exchange (2009-2014) | *EP* | *ROA, ROE* | - | Positive |
| *Ganda & Milondzo (2018)* | 63 enterprises in South Africa (2015) | *Effect of CE* | *ROI, ROE, ROS* | - | Negative |
| *Nuzulus (2019)* | 27 chemical enterprises in Japan (2012-2015) | *EC* | *ROA, ROE, NPM, Tobin's Q, PER* | - | ROA (negative) ROE (no significant impact) NPM (negative) Tobin's Q (negative) PER (no significant impact) |
| *Ermaya & Mashuri (2020)* | 23 enterprises in Indonesia (2016-2018) | *EP, EC, ISO 14001* | *FP* | - | EP (positive), EC (negative), ISO 14001 (no significant impact) |
| *Yjoti & Khanna (2020)* | 21 service enterprises in India (2014-2019) | *EP* | *ROI, ROE, ROCE* | ROI, ROE, ROCE (weak positive) | Negative |
| *Kalash (2021)* | 49 enterprises from Istanbul stock exchange (2014-2019) | *EP* | *ROA, ROE, OP* | - | Positive |
| *Galant & Cvek (2021)* | 150 enterprises in Croatia (2018) | *EP* | *FP* | - | Positive |
| *Fauzi (2022)* | 64 enterprises from chemical and manufacturing sector in Indonesia (2016-2018) | *EP* | *ROE, Tobin's* Q | - | Positive |
| *Ramlawati et al. (2022)* | 15 enterprises in Indonesia (2018-2020) | *EP* | *ROE* | - | Positive |
| *Naseer et al. (2023)* | 2711 enterprises in the USA (2001-2021) | *EP* | *ROA, Tobin's Q, EPS* | - | Positive |

| | | | | | |
|---|---|---|---|---|---|
| *Inalloa et al. (2023*) | 108 manufacturing enterprises in Iran (2013-2020) | *Control of pollution, Environmental damage prevention, Research, development and conservation of natural resources, Environmental policy* | *ROI, ROE, ROA, Book value, Market value, Residual profit* | - | Positive |

*Source: Authors*

*Maksum & Tamba (2017)* conducted research that examined the influence of EP on FP. The result suggested that EP has no significant effect on FP. Similarly, *Yjoti & Khanna (2020)* investigated the impact of EP on ROI, ROE and ROCE. The research was conducted in the period 2014-2019 in the UK. The results of the correlation analysis showed that there is a weak positive influence of EP on ROI, ROE and ROCE. Regression analysis showed the existence of a negative impact of EP on all observed FP indicators.

It can be concluded that previous research indicated that enterprises from developing countries, as well as enterprises that stand out as enterprises that respect environmental principles the most, have greater effects on FP due to the improvement of environmental indicators. However, not all research has proven the positive effects of improving environmental indicators on FP of resource use, which can be explained by considering the analysis of this impact in the short term.

Research that dealt with the influence of EC for the enterprise on FP of resource use is also highlighted.

*Firdausi Nuzulus (2019)* investigated the effects of EC on FP of resource usage. The independent variable in the research was the EC, while the dependent variables were: ROA, ROE, NPM, PER and Tobin's Q. The results showed a negative impact of EC on ROA, NPM and Tobin's Q, while no significant impact is observed for ROE and PER indicators.

*Laela Ermaya & Saputri Mashuri (2020)* came to the result that EP has a significant positive effect on FP of resource use, then EC has a negative effect on FP, while ISO 14001 standards have no significant effect on FP.

## 3. Impact of financial performance of resource use on environmental performance

In the relevant literature, some studies proved the positive influence of FP of resource use on EP of enterprises.

*Peter Osazuwa & Che-Ahmad (2016)* proved the existence of a positive impact of profitability on the relationship between eco-efficiency and enterprise value. Similarly, *Laguir et al. (2017)* conducted research in the period 2008-2011. The positive impact of all the mentioned indicators of FP (ROA, EBIT and EBITDA) on EP of the analyzed banks was observed. In addition, *Farhan et al. (2023)* showed a positive impact of ROA

on total sustainability expenditure (total sustainability costs - SUS). The same direction of correlation exists when it comes to the impact of ROA on environment and pollution control-related expenses (ENV). This study resulted in a positive effect of liquidity on the environment and a positive effect of liquidity on environmental consumption. *Efendi et al. (2020)* proved that there is a negative impact of profitability on CE by enterprises. The study by *Moshud (2020)* based on assessing the influence of profitability indicators on the publication of environmental data. The results showed that there is a significant positive impact of profitability on environmental disclosure. In contrast, *Ardi & Yulianto (2020)* conducted research where the results showed that the profitability of the enterprise does not affect the disclosure of data on the impact of the enterprise on the environment. Similar to this research, *Fatmawati & Trisnawati (2022)* analyzed the impact of enterprise profitability on reporting on EP and sustainability (Sustainability Reporting Disclosure - SRD). The results of the analysis showed that profitability does not have a significant impact on the disclosure of environmental data.

Also, some studies didn't prove the positive impact of FP of resource usage on EP of enterprises.

*Wihandoko et al. (2022)* dealt with the research of non-financial enterprises. This research proved that enterprise profitability has a negative impact on EP.

*Aigbedo (2019)* analyzed the impact of FP (ROA, ROE, ROS) on EP for 2012. The research focused on enterprises from different parts of the world (Europe, North America and Asia). The research found that enterprises based in Europe have slightly better EP and practices, however, overall, the research showed that there is no statistically significant relationship between the examined variables.

*Vinayagamoorthi et al. (2015)* investigated the influence of FP (ROA, ROE and ROCE) on EP (energy intensity). The results of the analysis showed that energy intensity has a negative impact on ROCE, while the impact on ROA, ROE and ROS is positive.

Table 2 Systematization of research results on the influence of FP of resource usage on EP

| Research | Sample | Independent variable | Dependent variable | Correlation | Regression |
|---|---|---|---|---|---|
| | | | | Connection | Impact direction |
| *Vinayagamoorthi et al. (2015)* | 191 enterprises from Bombay Stock Exchange (2004-2014) | *ROA, ROE, ROS, ROCE* | *Energy intensity* | ROA (weak negative) ROE (weak negative) ROS (weak positive) ROCE (weak negative) | ROCE (negative) ROA, ROE, ROS (positive) |
| *Osazuwa & Che-Ahmad (2016*) | 667 non-financial enterprises in Malaysia (2013) | *Profitability, Leverage* | *Eco-efficiency/ enterprise value* | - | Profitability (positive) Leverage (no significant impact) |
| *Laguir et al. (2017*) | 68 French banks (2008-2011) | *ROA, EBIT, EBITA* | *EP* | - | Positive |

| | | | | | |
|---|---|---|---|---|---|
| *Aigbedo (2019)* | 50 industrial enterprises (2012) | *ROA, ROE. ROS* | *EP* | - | No significant impact |
| *Ardi & Yulianto (2020)* | 9 enterprises from agricultural and mining sector in Indonesia (2014-2018) | *Profitability, Leverage* | *Publication of environmental data* | - | Profitability (no significant impact) Leverage (Negative) |
| *Efendi et al. (2020*) | 35 manufacturing enterprises in Indonesia (2020) | *Profitability, Leverage* | *CE* | - | Profitability (Negative) Leverage (Positive) |
| *Moshud (2020)* | 82 enterprises in Nigeria (2012-2016) | *Profitability* | *Publication of environmental data* | - | Positive |
| *Wihandoko et al. (2022*) | 13 enterprises from Indonesia stock exchange (2017-2020) | *Profitability, Leverage, EC* | *EP* | - | Negative |
| *Fatmawati & Trisnawati (2022*) | 39 enterprises from Indonesia stock exchange (2018-2020) | *Profitability, Leverage* | *Sustainability Reporting Disclosure* | - | No significant impact |
| *Farhan et al. (2023*) | 75 enterprises in India (2015-2021) | *ROA, Liquidity, Leverage* | *SUS, ENV* | Weak positive (ROA, SUS), Weak negative (Levage, SUS) Weak positive (ROA i ENV) | Liquidity, ENV (positive), Liquidity, SUS (positive) |

*Source: Authors*

## 4. Interdependence of environmental performance and financial performance of resource usage

There are relevant studies that suggested and proved the significant interdependence of financial and EP of enterprises.

Table 3 Systematization of the results of research on the mutual influence of FP and EP of enterprise

| **Research** | **Sample** | **Independent/ dependent variable** | **Independent/ dependent variable** | **Correlation** | **Regression** |
|---|---|---|---|---|---|
| | | | | **Connection** | **Impact direction** |
| *Sarumpaet (2005*) | 87 enterprises in Indonesia (1996-2000) | *ROA* | *EP* | - | No significant impact |
| *Montabon (2007*) | 45 enterprises in the USA | *Sales growth, ROI* | *Recycling, Reduction of waste, Remanufacturing, Ecological design* | Significant positive | - |

| | | | | | |
|---|---|---|---|---|---|
| *Smith et al. (2007)* | 40 enterprises in Malaysia on Kuala Lumpur Stock Exchange (2002) | *CER* | *ROA, ROE, EPS, Taxation, Market participation* | ROA (medium negative), ROE (medium negative), Other indicators – no significant | - |
| *Dusseldorp (2008)* | 100 enterprises from the food industry in the Netherlands (2005) | *Energy use, Water pollution, Noise, Waste production, Odor, Hazardous substances, Soil pollution, Air pollution* | *Efficiency, Profitability, Income* | Positive | - |
| *Vijfvinkel et al. (2011)* | 337 Dutch and Chinese enterprises | *Environmental sustainability* | *Profit growth, Income* | - | Positive |
| *Aguilera-Caracuel & Ortiz-de-Mandojana (2013)* | 140 enterprises in Europe (2007-2010) | *EP* | *ROA* | - | Positive |
| *Küçükbay & Küçükbay (2016)* | 30 enterprises in Turkey (2015) | *ROA, B/M ratio* | *EP* | Weak positive | - |
| *Tang & Wang (2017)* | 620 enterprises in the USA | *Tobin's* Q | *CE* | - | Positive |
| *Bartolacci et al. (2018)* | 45 enterprises in Italy (2012-2015) | *ROA* | *EP* | Weak positive | - |
| *Wahyuningrum & Budihardjo (2018)* | 200 enterprises in Australia (2014) | *ROA, ROE, ESP* | *EP* | - | Positive (ROE, ESP) ROA (No significant impact) |
| *Robaina & Madaleno (2019)* | 17 sectors in Portugal (2008-2016) | *ROA* | *CE intensity* | Weak positive | Positive |
| *Xinlu (2020)* | 29 manufacturing enterprises in China (2012-2018) | *ROE, Tobin's Q* | *EP* | - | Positive |
| *Setyawan (2020)* | 300 enterprises from Central Java Province (2019) | *ROA* | *EP* | - | No significant impact |
| *Matuszewska-Pierzynka (2021)* | 59 enterprises in the USA (2015-2020) | *Cash-flow* | *CER* | - | Negative |
| *Şimşek & Öztürk (2021)* | 214 enterprises in Turkey | *FP* | *EA* | - | Positive |
| *El-Mohr et al. (2021)* | 69 enterprises in Egypt (2007-2013) | *Cumulative return on shares* | *ISO 14001* | - | No significant impact |
| *Li et al. (2022)* | G7 enterprises (2004-2020) | *ROA, ROE* | *Sustainability performance* | Weak positive | - |

| | | | | | |
|---|---|---|---|---|---|
| *Jia & Li (2022)* | 1466 enterprises in Australia (2007-2015) | *Financial problems* | *EP* | - | Negative |
| *Dewi & Widyawati (2023)* | 63 enterprises in Indonesia (2020) | *ROA* | *Disclosure of sustainability performance* | - | No significant impact |
| *Rahi et al. (2023)* | 795 European enterprises (2015-2020) | *Tobin's Q, EVA* | *EP* | - | Positive |

*Source: Authors*

*Montabon (2007)* conducted research involving enterprises in the USA, which resulted in the existence of a significant positive relationship between the following EP indicators: recycling, proactive waste reduction policy, remanufacturing and environmental design of the product, on the one hand, and FP indicators (ROA, sales growth), on the other hand. Similarly, *Dusseldorp (2008)* surveyed 100 enterprises belonging to the food industry. The research examined the connection between environmental (energy use, water pollution, noise, waste production, waste materials, hazardous substances, soil pollution, air pollution) and FP (efficiency, profitability and income). The existence of a significant positive statistical relationship was established. Also, *Küçükbay & Küçükbay (2016)* determined the existence of a positive relationship between ROA and M/B ratio (Market Value/Book Value ratio) and EP. *Bartolacci et al. (2017),* looking at the four-year period from 2012 to 2015, investigated the interdependence of environmental (environmental practices implemented) and FP (ROA). The analysis showed a positive relationship between the analysed performance indicators. *Xinlu (2020)* concluded that EP indicators were correlated with FP indicators (ROE and Tobin's Q), confirming a significant positive relationship. *Rahi et al. (2023)* examined the interdependence of FP (Tobin's Q, EVA) and EP. The results of the analysis suggested the existence of a significant positive relationship.

*Smith et al. (2007)* analysed the interconnection between corporate environmental reporting (CER) and FP. The analysis established that there is statistical significance for the ROA and ROE indicators. Similarly, *Tang & Wang (2017)* investigated the influence of CE on FP (Tobin's Q). The results showed that enterprises with better FP have greater transparency in publishing data on CE. Also, reducing CE, according to research results, would lead to improved FP. *Şimşek & Öztürk (2021)* investigated the relationship between EA and FP. With the increase in environmental awareness, EA is introduced within the traditional accounting system. The analysis established the existence of a significant positive relationship between EA and FP. Similarly, *Dewi & Widyawati (2023)* examined the interdependence of FP (ROA) and sustainability performance disclosure. Research results, in contrast to previous studies, didn't show the existence of a significant relationship between the analyzed performances. *Li et al. (2022)* conducted research and concluded that in years without financial crises, enterprises that base their operations on sustainability have better financial results, as well as enterprises with better financial results, direct their operations towards ecological operations (a significant positive relationship between ROA and ROE, on the one hand, and sustainability performance, on the other hand). During the crisis, a significant negative relationship was noted. In general, for all observed years, a weak positive relationship was proved, on average, between ROA and ROE and sustainability performance.

*Aguilera-Caracuel and Ortiz-de-Mandojana (2013)* proved that the level of intensity of green innovations (GI) in the enterprise is in positive correlation with FP of resource use. The stricter the environmental regulations in a country, the weaker the positive relationship between the intensity of GI and the improvement of FP.

Contrary to the previous one, there is also a group of researches that proved that there is no statistically significant interdependence between FP and EP of enterprises.

*Sarumpaet (2005)* came to the conclusion that ROA has no significant interdependence with EP. Similarly, *Setyawan (2020)* investigates small and medium-sized enterprises. The analysis covered the influence of EP on FP of resource use, and vice versa, financial on EP of enterprises. It was concluded that there is no significant statistical relationship in both directions. ROA indicator was used as a measure of FP. Also, *Sri Wahyuningrum & Arief Budihardjo (2018)* investigated the relationship between EP and FP. The result implied that there is no significant statistical relationship between ROA and EP, while the relationship between EP and ROE, as well as EP and EPS indicators, is positive. The limitation of the study refers to the sample itself, which included enterprises from only one country that were analysed in one year. *El-Mohr et al. (2021)* examined the interdependence of environmental (existence of ISO 14001 certificate) and FP (cumulative stock returns). The results showed that there is no statistically significant relationship between the observed performance groups.

In addition, some studies pointed to the negative interdependence of EP and FP of resource use.

In their research, *Robaina & Madaleno (2019)* investigated the interdependence of environmental and FP in 17 sectors. The research was based on ROA (as FP indicator) and carbon intensity (as EP indicator) by sector. The analysis established the existence of a significant positive relationship between the variables. Also, in his research, *Matuszewska-Pierzynka (2021)* intended to determine the link between EP and FP. A negative relationship between these performance groups was established.

## 5. Conclusion

There is a trend of increasing interest in the preservation of the environment, due to the increase in the exploitation of natural resources and pollution caused by the human factor. The concept of social and, especially, environmental responsibility is being adopted by an increasing number of enterprises. Especially in developed countries, enterprises are adopting the principles of circular and regenerative economy, while enterprises in developing countries are also demanding the application of ecological practices and initiatives. Monitoring the success of incorporating these practices into the enterprise's operations requires measuring EP, but also assessing the impact of improving EP indicators on FP of the enterprise's resource use.

Research that examines the relationships and mutual influences of EP (emissions reduction, control of pollution, environmental damage prevention, conservation of natural resources, EC, publication of environmental data, environmental accounting, energy intensity, energy use, eco-efficiency, CE, sustainability reporting disclosure, water/air/soil pollution, waste production) and FP of resource use (ROA, ROE, ROS, ROI, ROCE, Tobin's Q, EVA, Profitability, EBIT, EBITA, Liquidity, Leverage, M/B ratio, Sales growth, Efficiency, Income) are mostly focused on the mutual influence of EP and indicators of profitability and market

performance of the enterprise. Research that examined the impact of environmental on FPof resource use presented different results. Nevertheless, it is noted that in most of the conducted analyses, the positive impact of the introduction of environmental measures and initiatives on FP, has been proven. Studies examining the impact of financial on EP also provided mixed results. Here, the existence of positive and negative influence is noted equally, as well as research where there is no statistically significant relationship between the analysed variables. The third group of researchers who examined the mutual influence of environmental and FP, in the largest percentage proved the existence of positive interdependence.

The number of researches and interest in the question of connection between environmental and FP is growing over time, as shown by the large number of published papers over the last 5 years. The most common limitations in published research are the number of enterprises included in the sample, a short period of observation and the number of included variables. Nevertheless, the existing research included enterprises from different countries, both developed and developing countries, and enterprises from different sectors.

***Acknowledgement:***
This research is part of the 101136834 – CROSS-REIS – HORIZON-WIDERA-2023-ACCESS-03 project, funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the European Research Executive Agency can be held responsible for them.

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