



Accounting challenges for sustainability and innovations

Marzena Remlein
Editor



eISBN 978-83-8211-055-5

<https://doi.org/10.18559/978-83-8211-055-5>

PUEB PRESS



POZNAŃ UNIVERSITY
OF ECONOMICS
AND BUSINESS

© Copyright by Poznań University of Economics and Business
Poznań 2021



This textbook is available under the Creative Commons 4.0 license – Attribution-Noncommercial-No Derivative Works

7.

EXTERNAL COSTS— ACCOUNTING PERSPECTIVE



Ewelina Kuberska

Poznań University of Economics and Business

Abstract: Nowadays, shareholders would like to receive more information about companies' activities. They would like to know how the company treats their local community, how their activities influence the environment or even if the company's activities are harmful for society. This information is needed and has to do with costs for society. Tracking these costs, called external costs, more precisely seems to be becoming more important in accounting and is starting to become a new research area. The need for treating external costs like a part of research in accounting is indicated by a trend of the accounting of social responsibility, the theory of legitimacy in accounting, the concept of full cost accounting and the directive on disclosure of non-financial information. The use of the environment isn't free of charge for companies. According to national laws, companies are obligated to pay environmental fees or taxes when using the environment. Existing fees and taxes for using the environment don't resolve the problems of measuring and evaluating the external costs in companies. What is important to note is that external costs are connected with using goods such as air, soil, water, silence or the aesthetics of the surroundings. They all are non-marketable goods; they don't have prices on the market. Therefore, one of the non-market valuation methods could be used to evaluate them. One of the biggest problems for accounting in the future will be measuring the volume of using these goods or measuring the size of reduction in the quality of public goods suffered and assigning the decrease to particular companies.

Keywords: accounting for externalities, corporate reporting, directive on disclosure of non-financial information, evaluation in accounting, external costs, full cost accounting, sustainability accounting.

7.1. Why should external costs be a part of research in accounting?

The theory of accounting has a lot of research areas. The development of trends and companies around the world inspires new concepts, methods and theories. Sustainable development and everything which is connected with it creates new paths of research in accounting. Nowadays, companies, usually the biggest ones, publish not only financial information, but also non-financial information. The term “non-financial information” is defined in different ways. Mostly, we could define it as information which isn’t presented in financial statements. More specifically, we can define it as information which concerns a company’s activities which affect the environment, society, workers, human rights, etc. around it and how those activities influence them. Sustainable accounting is a new research area in accounting, that is seeing an increasing amount of research. For example, we noticed an article about the content of a CSR report, the challenges and needs for sustainable reporting, the level of companies’ involvement in sustainable reporting, and the guidelines used most frequently in sustainability reports. Nowadays, shareholders would like to receive more information about companies’ activities. They would like to know how the company treats their local community, how their activities influence the environment or even if the company’s activities are harmful for society. The activities which have a positive influence on society and could have potential positive effects are also crucial for shareholders. This information is needed and has to do with the benefits and costs for society. Neither these benefits nor these costs are a part of financial performance. They haven’t even been an area of research in accounting until recently. These costs, called external costs, are a part of the theory of economics. Nowadays it seems to be important to begin tracking external costs more precisely in accounting and start treating it as with a new research area. This is indicated by:

1. **A trend of accounting of social responsibility:** accounting which aim to account for the social burdens and benefits resulting from the activity of an economic operator, presented descriptively or in the form of value (Gabrusewicz, 2010, p. 60). Such consideration of social responsibility requires identifying, measuring and presenting social and environmental issues connected to the operations of an enterprise (Macuda, 2015, p. 1).
2. **The theory of legitimacy in accounting:** maintaining and growth of economic operators relies not only on high levels of economic prosperity, but also on the acceptance of the surroundings (Szadziewska, 2014, p. 262). Due to this, enterprises, as an element of social structure, will aim to obtain social acceptance (legitimacy) of the conducted operations (Matuszak, 2015, p. 114). Accounting in this case will be used as a means of obtaining, maintaining or regaining said

acceptance (Matuszak, 2015, p. 114). Acceptance will be granted on the basis of the available information. To grant acceptance, the society will require the enterprise to disclose information regarding the generated influence on the society and the environment. The trends in social development show that, for the society, information regarding the influence of the operations conducted by enterprises on the environment and the society will be crucial during its evaluation of the enterprise.

3. **The concept of full cost accounting:** aims to aid in identifying the internal and external costs (D’Onza, Greco, & Allergini, 2016, p. 60) of an enterprise. Moreover, this concept is aimed at evaluating the external influence generated by an enterprise (of both negative and positive nature), visible in the form of external effects of social and environmental nature (Bebbington & Gray, 2001, p. 11). The concept takes account for external costs, defined as the costs of external effects, as part of the overall costs in the science of accounting. The costs of external effects is the negative influence of the operations of enterprises on their surroundings: the society and the environment. To assess a complete cost account, it is crucial to present all costs in a universal measure: currency. It is thus important to constantly widen the practice of evaluation in the science of accounting.
4. **The directive on disclosure of non-financial information:** obliges certain operators to disclose non-financial information. The word ‘non-financial’ should not be understood literally as information that is not connected to finance or not expressed in currency. According to Krasodomska (2014, p. 26), non-financial information should be defined as information which has not so far been published as part of a financial report. The disclosed non-financial information should concern social and environmental issues. Among them, there should be a description of the operator’s policies regarding these issues, along with the results of these policies.

7.2. Definition of external costs

External costs is a new research area in accounting. Therefore there isn’t one single definition of this term. Mostly, the definition of external costs is connected with the definition presented in economics. External cost means the harmful and negative influence of a company’s activities which are neither taken into account when assessing a company’s performance nor in financial reports. External costs are borne by others such as the rest of the country, the continent, the world or the coming generations. Moreover, fixating on one definition for the term appears difficult. In literature, terms such as the following have been used: *externalities* (Dahlman, 1979, s. 141), *external effects* (Killinger, 2000, p. 25), *external economies*

(Scitovsky, 1954, p. 143), *third party-effects* (Lin, 1976, p. 1) or *spillover effects* (Lin, 1976, p. 1). These terms refer to not only the negative influence of a company's activity, but overall to the influence of a company's activity: both negative and positive on the environment and society, i.e. people not involved in a particular transaction. Different kinds of a company's activity could contribute to different externalities. For example, one of the most controversial types of business which is popular in the Polish news because of their harmful effects on society and its communities is the mink industry. One of the most visible negative externalities for society connected with this business is strong odour. Other external costs observed are environmental pollution, depletion of the aesthetic value of landscapes, depletion of biodiversity, noise pollution, etc. Even though the business activity creates new jobs and gives people the opportunity to earn money, get experience and develop themselves, it could also contribute to a decrease in human quality of life. Due to the limited nature of this text, in the next section, we will cover a few of the most popular industries which could have some of the highest external costs from their activities.

7.3. External costs of company's activities

The highest-priority financial goal for companies is to earn the highest possible profit in the short-term and increase company value in long-term. These goals can be achieved by employing a strategy appropriate for the business, good company organization and management, hiring experienced and educated workers, etc. All of a company's decisions have an influence on the extent of their costs. The costs of running a business are crucial for earning a profit as well as for increasing or maintaining company value. Such costs are diverse and could be divided into ones which are incurred by the company and those ones that exist but aren't taken into account by the company. The latter are external costs and they are incurred by society. This means that companies run their businesses using societal resources like the environment, peace and quiet, and the aesthetic of the surroundings without any payment or compensation to society. Due to the short length of this article, we will focus on the external costs of a few industries: transport, mining and agriculture.

7.3.1. External costs of the transport business

The transport business is divided into road transport, air transport and water transport. Each of these activities uses public goods such as roads and their surroundings, waterways, seas and/or rivers, peace and quiet in different places and clean air. The main external costs of the transport business are air pollution, climate change

and noise. The external costs of the transport business also include the time loss of all other road users due to a decrease in speed caused by additional vehicles on roadways (Mayere, Ochelen, & Proost, 1996, p. 112).

7.3.2. External costs of the mining business

The mining business is based on exploiting natural resources to convert them into ready-to-use products or to sell them as-is for further processing. The industry uses energy resources such as natural gas, crude oil, and coal whilst exploiting other natural resources such as stone, cupric, lead, zinc, iron, rock salt, bauxite, gypsum, etc. The environmental impacts of mining activity can have local, regional, and even global effects directly and indirectly. The impacts include erosion, loss of biodiversity, the contamination of soil, groundwater, and surface water by the chemicals emitted from mining processes, noise, nuisance and a decrease in the aesthetics of surroundings (Bebbington, Brown, & Frame, 2007, p. 229; Bebbington & Frame, 2003, pp. 12–13).

7.3.3. External costs of agricultural production

Agricultural production refers to the production of (Ritchie, 2020):

- crops (including cereals, roots and tubers, legumes and nuts, fruits and vegetables, sugar crops, oil crops, cocoa, coffee, tea and tobacco, etc.),
- meat (poultry, pork, beef, buffalo, sheep, goat, goose, guinea fowl, camel, horse, duck, wild game),
- dairy (milk and eggs),
- fish and seafood (freshwater fish, pelagic fish, demersal fish, marine fish, crustaceans, molluscs)—the world now produces more seafood from fish farms than wild catch.

Agricultural production affects the environment and human health. A literature review revealed data on such externalities in three broad damage categories: natural resources (comprised of water, soil and air subcategories), wildlife and ecosystem biodiversity and human health (comprised of pathogen and pesticide subcategories). The external costs of agricultural production could be presented in detail as per Tegtmeier and Duffy (2004, p.4):

- 1) damage to water resources: treatment of surface water for microbial pathogens, facility infrastructure needs for nitrate treatment, facility infrastructure needs for pesticide treatment,
- 2) damage to soil resources: cost of water industry, cost to replace lost capacity of reservoirs, water conveyance costs, flood damages, damages for recreational

- activities, cost of navigation: shipping damages and dredging, instream impacts: commercial fisheries, preservation values, off-stream impacts: industrial users, steam power plants,
- 3) damage to air resources: cost of greenhouse gas emissions from cropland, cost of greenhouse gas emissions from livestock production,
 - 4) damage to wildlife and ecosystem biodiversity: honeybee and pollination losses from pesticide use, loss of beneficial predators by pesticide applications, fish deaths due to pesticides, fish deaths due to manure spills, bird deaths due to pesticides,
 - 5) damage to human health: cost of illnesses caused by common foodborne pathogens, pesticide poisonings and related illnesses.

7.4. Environmental fees versus external costs

Company activities are not free of charge when they must use the environment. According to national laws, companies are obligated to pay environmental fees or taxes when using the environment. The rules for charging environmental fees (charges or taxes) and the scope of entities and activities concerned with the environment differ among nations. For example, environmental fees and taxes are imposed in Poland in the areas of (Rogulski, 2015):

- emission of gases or dust into air,
- consumption of water,
- emission of wastewater into water and soil,
- storage of water.

Besides the fees for using the environment there also exist penalties and additional fees for inconsistent use of the environment. This means that additional fees and taxes from using the environment not as agreed are incurred by companies and this adds to the companies' costs. Those costs are taken into account when calculating a company's performance and it shows that companies bear the consequences of their influence on the environment and society. With this consideration the following questions come up:

1. Does the existence of environmental fees and taxes mean companies bear all consequences of their influence on the environment and society?
2. Should the environmental fees be equal to external costs?
3. Does the existence of environmental fees mean that external costs are taken into account to calculate a company's performance?
4. Does the existence of environmental fees and taxes mean new research in accounting around external costs are non-essential?

At the beginning of consideration of environmental fees, the aforementioned questions could undermine the importance of research in external costs. To

understand why environmental fees aren't external costs, wider consideration should be made. First of all, the existence of fees for using the environment doesn't mean that society isn't burdened by the company's activity. Those fees are usually given to repair damage to the environment. It means that society incurs the external costs such as air pollution. Even if the negative consequences of a company's activities are minimised by governments, there is some period of time when society is burdened by them. Moreover, we should notice the following differences between environmental fees and external costs:

- the scope of external costs could be wider than environmental fees,
- some of environmental fees could reflect the value of external costs,
- environmental fees and taxes are a payment to repair damage to the environment which means that a company's activity negatively influenced society and the environment for some period of time,
- environmental fees are only fiscal payment, the value of influence of company's activity could be different using market prices to evaluate,
- even though some environmental fees could be treated as external costs, not all external costs are taken into account to calculate performance in this way and the value of environmental fees probably doesn't reflect the true cost for society.

The following arguments show that existing fees and taxes for using the environment does not resolve the problems of measuring and evaluating the external costs in companies. According to full cost accounting, one must take into account external costs to calculate a company's performance.

7.5. Evaluation of external costs

Evaluations are an area of research in accounting. This is confirmed by the substantial amount of research regarding evaluations presented in literature concerning accounting. Evaluations in regard to accounting have, so far, been focused on the evaluation of phenomena, events or resources within an enterprise. However, the issue of evaluation in itself was boiled down to the choice of the right concepts and evaluation parameters in regard to the evaluated item, with the aim of determining its value for a certain purpose. The conducted research about evaluations in regard to accounting concerned areas, where evaluations are determined in monetary units. Aside from elements, which undoubtedly can be, and are, evaluated through accounting, there are also such, which have, so far, not been considered in terms of accounting, and which also require evaluation. Good examples of such elements are goods, such as air, silence, the environment or the aesthetics of the surroundings. The current direction of progress in accounting points to a need of including elements which have, so far, not been subject to evaluation in regard to the subject of evaluation in accounting. One of these subjects is external cost. What

is important, external cost is connected with using goods such as air, soil, water, silence or the aesthetics of the surroundings. They all are public goods. Based on the fundamental definition of the costs in accounting, it is seen that these costs are connected with using material or services which were the object of transaction on the market. The next approach to the cost in accounting is based on the decrease the value of assets. The influence of a company's activity on the environment and society (external costs) is connected with using or decreasing the quality of goods such as air, silence, soil and water. Thus, the approach to evaluation of external costs could be based on:

- the evaluation of the public goods (air, silent, soil and water) and measuring of the usage,
- the evaluation of the public goods (air, silent, soil and water) and measuring of the reduction in the quality of the public goods.

Goods like air, silence, soil, water and the aesthetics of the surroundings are non-marketable goods. They don't have prices on the market. Therefore, one of the non-market valuation methods could be used to evaluate them. The non-market valuation methods are divided into: contingent valuation, choice experiment method, avoided cost method, replacement cost method, travel cost method and hedonic pricing method. The most important information which describes these methods are presented below (Baker & Ruting, 2014; Zandersen, Bartczak, Czajkowski, Giergiczny, & Termansen, 2012):

- Contingent valuation involves asking people to make choices about environmental outcomes and payments that can be used to estimate how much they are willing to pay for a non-market outcome to be provided. This outcome, or 'good', is valued as a whole (e.g. the amount of money people would be willing to forgo through additional taxes for improvements in vegetation along a river). Typically, people are asked whether or not they would be willing to pay a set amount of money for the environmental outcome to occur.
- Choice experiment method involves offering people choices between different options that are made up of sets of attributes or characteristics that describe a policy outcome. For example, attributes might indicate numbers of birds and fish, an area of vegetation, and the cost to the individual or their household. 'Implicit prices' are then estimated for each attribute, reflecting average willingness to pay for an additional unit. The value placed on a particular policy option is the sum of the value of its attributes.
- Avoided cost method infers the value that people place on non-market outcomes by examining what they pay to avoid or mitigate negative impacts. For example, the amount of money that people spend on double glazing windows could proxy for the costs of traffic noise, but this may not be a reliable proxy if the double glazing does not fully mitigate the noise or if people also double glaze to save on heating costs.

- Replacement cost method strongly suggests that all goods can be replaced without loss of functions or values—in physical and biological terms and in the eyes of people. The more unique and complex a ‘good’ is, the harder it is to justify the use of this valuation method, as it would be almost impossible to copy and replace these goods. For example, if a forest is cleared, the value of that forest can be approximated with what it would cost to plant and maintain a similar forest somewhere else.
- Travel-cost method imputes the value that people place on visiting a recreation site by examining how much they spend to visit (including costs of transport, accommodation and park entry) and the cost of their time. These data are used to estimate the value of non-market goods like forests, nature parks, landscape parks etc.
- Hedonic pricing method deconstructs the price of market goods that are influenced by non-market outcomes. It involves estimating implicit prices for a number of characteristics that make up the good (in the case of housing, these could be the number of rooms, bushland views or proximity to a landfill). The method has often been used to estimate environmental amenity values by analysing house prices. It has also been used to estimate the value of a statistical life by analysing wages across jobs with different levels of risk.

Those methods aren’t a quick and easy process. One of the biggest problems for accounting in the future will be measuring the volume of using them or measuring the size of reduction in the quality of the public goods and assigning it to particular companies.

Tasks

Check your knowledge about external costs in accounting and answer the following questions.

1. Define external cost.
2. Give examples of external costs.
3. Explain why external costs are a crucial and important research area in accounting.
4. Describe the differences between external costs and environmental fees.
5. Explain the problem of evaluating external costs in accounting.

References

Baker, R., & Ruting, B. (2014). *Environmental policy analysis: A guide to non-market valuation*. (Productivity Commission Staff Working Paper, Canberra).

- Bebbington, J., Brown, J., & Frame, B. (2007). Accounting technologies and sustainability assessment models. *Ecological Economics*, 61, 224-236.
- Bebbington, J., & Frame, B. (2003). Moving from SD reporting to evaluation: The sustainability assessment model. *Chartered Accountants Journal*, 82(7).
- Bebbington, J., & Gray, R. H. (2001). An account of sustainability: Failure, success and a reconceptualization. *Critical Perspectives on Accounting*, 12(5), 557-588.
- Dahlman, C. J. (1979). The problem of externality. *Journal of Law and Economics*, 22(1), 141-162.
- D'Onza, G., Greco, G., & Allergini, M. (2016). Full cost accounting in the analysis of separated waste collection efficiency: A methodological proposal. *Journal of Environmental Management*, 167(2016), 59-65.
- Gabusewicz, T. (2010). *Rachunkowość odpowiedzialności społecznej w kształtowaniu zasad nadzoru korporacyjnego*. Warszawa: Wydawnictwo C.H. Beck.
- Killinger, S. (2000). *International environmental externalities and the double divided*. London: Edward Elgar Publishing.
- Krasodomska, J. (2014). *Informacje niefinansowe w sprawozdawczości spółek*. Kraków: Wydawnictwo Uniwersytetu Ekonomicznego w Krakowie.
- Lin, S. A. Y. (1976). *Theory and measurement of economic externalities*. New York, San Francisco, London: Academic Press.
- Macuda, M. (2015). Rachunkowość odpowiedzialności społecznej – raportowanie zagadnień środowiskowych. *Studia Oeconomica Posnaniensia*, 3(1), 97-111.
- Matuszak, M. (2015). Raportowanie o społecznej odpowiedzialności przedsiębiorstw (CSR) za pomocą narzędzia legitymizacji przedsiębiorstw. *Studia Oeconomica Posnaniensia*, 3(1), 112-134.
- Mayere, I., Ochelen, S., & Proost, S. (1996). The marginal external costs of urban transport. *Transportation Research D*, 1(2), 111-130.
- Ritchie, H. (2020). *Environmental impacts of food production*. Retrieved from <https://ourworldindata.org/environmental-impacts-of-food>
- Rogulski, M. (2015). Environmental fees. Polish case study. *Environment Protection Engineering*, 41(2), 81-97.
- Scitovsky, T. (1954). Two concepts of external economies. *The Journal of Political Economy*, 63(2), 143-151.
- Szadziewska, A. (2014). Rachunkowość jako źródło informacji na temat realizacji strategii społecznej odpowiedzialności biznesu. *Zeszyty Teoretyczne Rachunkowości*, 75(131), 95-123.
- Tegtmeier, E. M., & Duffy, M. D. (2004). External costs of agricultural production in the United States. *International Journal of Agricultural Sustainability*, 2(1), 1-20.
- Zandersen, M., Bartczak, A., Czajkowski, M., Giergiczny, M., & Termansen, M. (2012). *Guide on economic instruments & non-market valuation methods*. Warsaw: Warsaw Ecological Economic Center.