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Oleh Sokil
D.Sc. (Economics), Associate Professor,
Head, Accounting and Taxation Department,
Dmytro Motornyi Tavria State
Agrotechnological University
18 B. Khmelnytskyi Ave., Melitopol, 72310, Ukraine
oleh.sokil@tsatu.edu.ua
ORCID ID:
https://orcid.org/0000-0002-3121-826X

Dimitar Zvezdov
D.Sc. (Economics), Academic Councillor,
Research Associate,
Chair for Corporate Sustainability Management,
Friedrich-Alexander-Universität Erlangen-Nürnberg
7/9 Findelgasse, Nürnberg, 90402, Germany
dimitar.zvezdov@fau.de
ORCID ID:
https://orcid.org/0000-0002-7847-1158

Valerii Zhuk
D.Sc. (Economics), Professor,
National Scientific Centre
«Institute of Agrarian Economics»
10 Heroiiv Oborony Str., Kyiv, 03127, Ukraine
zhuk@faaf.org.ua
ORCID ID:
https://orcid.org/0000-0003-1367-5333

Svitlana Kucherkova
PhD (Economics), Associate Professor,
Accounting and Taxation Department,
Dmytro Motornyi Tavria State Agrotechnological University
18 B. Khmelnytskyi Ave., Melitopol, 72310, Ukraine
kucherkovas@gmail.com
ORCID ID: https://orcid.org/0000-0002-1953-063X

Liudmyla Sakhno
PhD (Economics), Associate Professor,
Accounting and Taxation Department,
Dmytro Motornyi Tavria State Agrotechnological University
18 B. Khmelnytskyi Ave., Melitopol, 72310, Ukraine
sakhnolyudmila5@ukr.net
ORCID ID: https://orcid.org/0000-0003-0339-3404

Social and environmental costs: the impact of accounting and analytical support on enterprises' sustainable development in Germany and Ukraine

Abstract. The authors investigate the theoretical and methodological ability of the accounting institute to solve the problem of information support for the implementation of the national (global) sustainable development policy. This ability is demonstrated by using methods of accounting and analytical support and mathematical analysis of the quadratic correlation and regression dependence of the added value of enterprises from the value of social and environmental costs. All studies were conducted separately for micro, small, medium and large enterprises in Ukraine and Germany (2011-2019).

The results are designed using the U-shaped curve which demonstrates a direct relationship between environmental costs and the added value of the company for Ukrainian enterprises and indirect one for micro and large enterprises in Germany. Social expenses show a significant inverse U-shaped relationship with the value of the company in Ukraine, but large German enterprises fall out of this list and patterns.

The ability of integrated reporting to mitigate the imbalance between the added value of the enterprise (enterprise value) and social/environmental costs has been proven. It is determined that the formation and presentation of integrated reporting should be the prerogative of not only large enterprises, but also medium and small ones, and it will ultimately lead to the sustainable development of the region, industry, and country.

Keywords: Integrated Reporting; Social/Environmental Costs; Firm Value Added; Quadratic Correlation and Regression Analysis; Sustainable Development; Germany; Ukraine
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Сокіл О. Г.
доктор економічних наук, доцент, завідувач, кафедра обліку і оподаткування,
Таврійський державний агротехнологічний університет імені Дмитра Моторного, Мелітополь, Україна
Звєздов Д.
доктор економічних наук, академічний радник,
науковий співробітник, кафедра управління сталим розвитком,
Університет Ерланґена-Нюрнберга, Нюрнберг, Німеччина
Жук В. М.
доктор економічних наук, професор, академік НААН,
Національний науковий центр «Інститут аграрної економіки», Київ, Україна
Кучеркова С. О.
кандидат економічних наук, доцент, кафедра обліку і оподаткування,
Таврійський державний агротехнологічний університет імені Дмитра Моторного, Мелітополь, Україна
Сахно Л. А.
кандидат економічних наук, доцент, кафедра обліку і оподаткування,
Таврійський державний агротехнологічний університет імені Дмитра Моторного, Мелітополь, Україна

Соціальні й екологічні витрати: вплив обліково-аналітичного забезпечення на сталий розвиток підприємств у Німеччині та Україні

Анотація. Авторами було підтверджено науково-практичну гіпотезу про теоретичну та методичну спроможність інституту бухгалтерського обліку вирішувати проблему інформаційного забезпечення реалізації національної (глобальної) політики сталого розвитку.
Ця мета була досягнута шляхом використання методів обліково-аналітичного забезпечення та математичного аналізу квадратичної кореляційної і регресійній залежності доданої вартості підприємств від величини соціальних й екологічних витрат.
Всі дослідження були проведені окремо для мікро-, малих, середніх і великих підприємств України та Німеччини (2011–2019 рр.). Результати спроектовані за допомогою U-подібної кривої, яка демонструє прямий взаємозв'язок між екологічними витратами й доданою вартістю фірми для українських підприємств і навпаки – зворотним зв'язком для мікро- і великих підприємств Німеччини. Соціальні витрати показують значний зворотний U-подібний зв'язок із вартістю фірми в Україні, але великі німецькі підприємства випадають із цього списку й закономірності.
Доведено спроможність інтегрованої звітності пом'якшувати дисбаланс між доданою вартістю (цінністю) підприємства та соціальними/екологічними витратами. Визначено, що формування та подання інтегрованої звітності повинно бути прерогативою не тільки великих підприємств, а й середніх і малих, і це в результаті приведе до сталого розвитку регіону, промисловості, країни тощо цілому.
Ключові слова: інтегрована звітність; соціальні/екологічні витрати; додана вартість підприємства; квадратичний кореляційний і регресійний аналіз; сталий розвиток; Німеччина; Україна.

Сокол О. Г.
доктор экономических наук, доцент, заведующий, кафедра учета и налогообложения,
Таврический государственный агротехнологический университет имени Дмитрия Моторного,
Мелитополь, Украина
Звездов Д.
доктор экономических наук, академический советник, научный сотрудник,
кафедра управления устойчивым развитием,
Университет Эрлангена-Нюрнберга, Нюрнберг, Германия
Жук В. Н.
доктор экономических наук, профессор, академик НААН,
Национальный научный центр «Институт аграрной экономики», Киев, Украина
Кучеркова С. А.
кандидат экономических наук, доцент, кафедра учета и налогообложения,
Таврический государственный агротехнологический университет имени Дмитрия Моторного,
Мелитополь, Украина
Сахно Л. А.
кандидат экономических наук, доцент, кафедра учета и налогообложения,
Таврический государственный агротехнологический университет имени Дмитрия Моторного,
Мелитополь, Украина

Социальные и экологические издержки: влияние учетно-аналитического обеспечения на устойчивое развитие предприятий в Германии и Украине

Аннотация. Авторами была подтверждена научно-практическая гипотеза о теоретической и методической способности института бухгалтерского учета решать проблему информационного обеспечения реализации национальной (глобальной) политики устойчивого развития.
Эта цель была достигнута путем использования методов учетно-аналитического обеспечения и математического анализа квадратичной корреляционной и регрессионной зависимости добавленной стоимости предприятий от величины социальных и экологических издержек.
Все исследования были проведены отдельно для микро-, малых, средних и крупных предприятий Украины и Германии (2011–2019 гг.). Результаты спроектированы с помощью U-образной кривой, которая демонстрирует прямую взаимосвязь между экологическими затратами и добавленной стоимостью фирмы для украинских предприятий и наоборот – обратной связью для микро- и больших предприятий Германии. Социальные расходы показывают значительную обратную U-образную связь со стоимостью фирмы в Украине, но крупные немецкие предприятия выпадают из этого списка и закономерности.
Доказана способность интегрированной отчетности смягчать дисбаланс между добавленной стоимостью (ценностью) предприятия и социальными/экологическими издержками. Определено, что формирование и представление интегрированной отчетности должны быть прерогативой не только крупных предприятий, но и средних и малых, и это в конечном итоге приведет к устойчивому развитию региона, промышленности, страны.
Ключевые слова: интегрированная отчетность; социальные/экологические издержки; добавленная стоимость предприятия; квадратичный корреляционный и регрессионный анализ; устойчивое развитие; Германия; Украина.

1. Introduction

The discussion on sustainable development has reached an unprecedented extent. Albeit not without disagreement, the vast majority of researchers agree that the insufficient attention to resource consumption deprives future generations of an intact social and natural environment (Toth & Szigeti, 2016). Companies, in turn, have acknowledged their share in contributing to such a development both as polluters and as civil society actors (Prior et al., 2012). Furthermore, a business case in doing so has been created by many companies (Burritt et al., 2011).

Despite this acknowledgment, companies have been making only slow progress (Crutzen et al., 2017), so that pressure to account for their progress has been exerted. Therefore sustainability reporting has established as an effective form of pushing companies away from unsustainable practices (Schaltegger et al., 2015).

Current trends in changing of financial and non-financial reporting lead to greater interconnection and intersection of accounting methods and means, which activate the analytical component. This ultimately leads to the organization of accounting and analytical support system for sustainable development, as an ordered, independent, fully or partially decentralized system of monitoring, collection, identification, registration, generalization, processing, control and analysis of economic, social and environmental information. That is consistent with management objectives based on the advantages of modern needs for the development, justification and managerial decisions of sustainable development of enterprises (Sokil, 2017).

According to the analysis of the preparation of non-financial reports by enterprises in the world and Ukraine, their greatest concentration in Europe and South America was revealed. In Ukraine, the preparation of non-financial reports is still the prerogative of large national companies and representative offices of transnational corporations. However, the European integration processes accelerate and expand the introduction in Ukraine of integrated reporting or sustainable development reporting (Global Reporting Initiative, 2020).

The main goal of the article is to test the hypothesis on the need to introduce and improve the accounting method - reporting on sustainable development enterprises of all sizes. This is done in Ukrainian context. This goal will be achieved by mathematical analysis of the quadratic correlation and regression dependence of the added value of enterprises on the size of social and environmental costs.

2. Brief Literature Review

Current research in the field of monitoring, reporting and accounting for sustainable development is reflected in various sectors of the economy and interests (Schaltegger & Burritt, 2010; Bennett et al., 2013; Burritt et al., 2002, Figge et al., 2002), Liu, 2020). These studies cover the relationship of capital types in integrated reporting (Grassmann et al., 2019), analysis of the inverse and direct dependencies of financial stability and sustainable development (Trumpp &

Guenther, 2017). Today, an analytics of accounting reporting is moving to another stage, which produces the emergence of a new method: the forecasting. It can also be explained by budgeting and expansion of accounting functions in prospective studies and predicting the future management of the enterprise (Schaltegger & Beständig, 2012). And accordingly, research leads to the emergence of new conclusions and further incentives to study and expand issues of the modern accounting method - reporting.

In modern conditions and amendments to the Law of Ukraine «On Accounting and Financial Reporting in Ukraine» (The Verkhovna Rada of Ukraine, 2017), Management Reporting is the prototype of integrated reporting or reporting on sustainable development, containing not only a statement of facts, but also prospects and risks that the enterprise may face under the present conditions. The International Integrated Reporting Council (IIRC) defines integrated reporting as follows: a process founded on integrated thinking that results in a periodic integrated report by an organization about value creation over time and related communications regarding aspects of value creation (IIRC, 2020).

The prospect of changing accounting methods, and sometimes after the fact confirmation of already transformed methods, leads to a revision of the methodology of modern accounting (Zhuk & Bezdushna, 2017). Keeping track of sustainability activities as well as evaluating and communicating them requires that sustainability metrics are deployed. Therefore, sustainability indicators have enjoyed an increasing attention for at least two decades now (Searcy, 2012).

The new wave of environmental accounting studying and sustainability accounting has gained special popularity and recognition. Entire scientific schools emerged, led by a few scholars, mainly across Europe (Schaltegger et al., 2013).

The Ukrainian scientific school of sustainability accounting is only beginning to develop in the fields of Institutional Accounting Theory, namely: development and measure of integrated reporting in Ukraine (Zhuk & Bezdushna, 2017), options for the accounting methodology improving (Legenchuk & Usatenko, 2016), benefits of integrated reporting and prospects for its implementation in Ukraine (Krutova & Nesterenko, 2016), changes in accounting under the influence of sustainable development (Shigun, 2019).

Among the main impulses for the development of environmental and social accounting in Ukraine was the adoption of the Law of Ukraine «On Environmental Audit» (The Verkhovna Rada of Ukraine, 2004). It prompted accountants to rethink their understanding of accounting, its goals and methods. The latter, accounting methods, have been documented to determine the further improvement of all sustainable development accounting (Zvezdov & Schaltegger, 2015).

This article will also consider the main accounting method element - reporting. As the numerous studies show, this method has been continuously updating and improving. Reporting provides information for analysis and future forecasting or planning, but the latter is becoming increasingly relevant in modern accounting conditions in Ukraine (Zhuk & Bezdushna, 2017). This applies to large and medium-sized enterprises, who are legally required to publish management reports (integrated reporting) [16]. On the other hand, it is mainly environmental and social expenses that ensure sustainable development and provide the basis for reporting on sustainable development, integrated reporting etc. (Zhuk & Bezdushna, 2017).

The relationship between *corporate social responsibility (CSR)* and *corporate financial performance (CFP)* has been empirically investigated for decades (Orlitzky et al., 2003; Endrikat et al., 2014). First empirical studies prove a quadratic relationship between CSR activities and CFP (Trumpp & Guenther, 2017 ; Nuber et al., 2019; Wang et al., 2008; Fujii et al., 2013). To date, this positive effect remains on an aggregated level, as research does not answer the question, for which CSR activities, IR is able to moderate the value relevance. Thus, it is called to disentangle non-financial indicators that are decisive to shareholders. In addition, following the calls from Mervelskemper and Streit (2016), Nuber et al. (2019) and Wang et al. (2008) to apply alternative CSR measures studying the relationship between CSR and CFP, our study aims at answering, whether CSR expenditures represent information, which help investors to more accurately estimate a firm's value or value added at factor costs of enterprises.

Modern literature discerns between two scientific approaches to evaluating enterprises' value:

- value-creation;
- cost-concern.

The *cost-concern school* proposes a negative relationship between CSR and firm value, as CSR activities represent only cash outflows (Endrikat et al., 2014). Thus, an engagement in CSR is not in

the best interest of shareholders and puts companies at an economic disadvantage (Mervelskemper & Streit, 2016). Even though, CSR expenditures are a costly signal to investors, as they have a direct negative financial impact, they may signal the trustworthiness of firm's social responsibility. The *value-creation school* proposes a positive relationship between CSR expenditures and firm value, as CSR activities may create competitive advantages (Hassel et al., 2005). These competitive advantages, such as improved relationships with stakeholders, improved brand reputation or employee productivity, may promote the creation of shareholder value (Malik, 2015).

Literature, therefore, started to investigate a curvilinear, specifically quadratic, relationship for both, the environmental dimension and the social dimension of CSR and CFP (Nuber et al., 2019; Wang et al., 2008); Chen & Lin, 2015). Thereby, the relationship can either be U-shaped (i.e., *too-little-of-a-good-thing effect*) or inverted U-shaped (i.e., *too-much-of-a-good-thing effect*) (Trumpp & Guenther, 2017; Fujii et al., 2013). These two theoretical frameworks encompass both a positive and negative relationship between CSR and CFP. Whereas a U-shaped relationship assumes that a minimum level of CSR activities has to be exceeded to increase CFP, an inverted U-shaped relationship assumes that when a certain peak of CSR activities is exceeded, the positive contribution towards CFP decreases (Trumpp & Guenther, 2017; Wang at al., 2008). Furthermore, this paper finds a positive firm value effect for all firms publishing an integrated report independent of their amount of CSR expenditure.

This paper contributes to the literature by combining the two research streams focusing on the association between CSR and value added at factor costs of enterprises and the capital market effects of IR. First, the paper investigates whether environmental and social expenditures are regarded as value relevant by investors. Instead of a linear relationship, a quadratic relationship is proposed. Second, the paper expands the literature by using CSR expenditures that capture the CSR efforts of companies instead of their CSR outputs. In this context, especially CSR ratings are increasingly criticized for lacking comparability. Third, the paper contributes to the question whether IR can fulfill its information-enhancing purpose to investors. Thereby, the paper adds to current IR literature by disentangling the CSR expenditures that are moderated by IR beyond proving solely an aggregated positive capital market effect of IR. Fourth, in comparison with prior IR value relevance studies, the paper examines a longer time-period from 2011 to 2019 and uses a global sample for Ukraine and Germany, as called for by prior researches.

3. The purpose

The main purpose of the paper is to confirm the scientific and practical hypothesis about the need to introduce and improve the accounting method - reporting on sustainable development for Ukrainian enterprises of all sizes. This goal will be achieved by mathematical analysis of the quadratic correlation and regression dependence of the added value of enterprises on the size of social and environmental costs.

4. Methodology

This paper adopts an empirical research approach. To achieve the aforementioned objectives, we adopt a comprehensive research methodology, which comprises the following steps (Figure 1):

1. Analysis and data collection of social, environmental costs and value added. Official statistic data and specially prepared data after official appeals and inquiries to State Statistic Service of Ukraine (2020) and Germany (Destatis, 2020) were used. Social expenses include not only compulsory salary payments and accruals on it, but also bonuses, incentive payments, advanced training expenses, the creation of appropriate working conditions and rest etc. Environmental costs include: capital investments and operating expenses to create new and modernize existing fixed assets which are used in providing of environmental safety.
2. Application of accounting and analytical procedures for generalization and primary data processing. Formation of the research hypothesis: does a theoretical and methodological ability of the accounting institute to solve the problem of information support for the implementation of the global (and national) sustainable development policy?
3. Conducting analytical statistics tests, namely, correlation and regression analysis with the subsequent formation of a quadratic trend line.
4. Analysis of the correlation dependence results: the direct and inverted U-shaped trend lines. Preparation of conclusions about the ratio between social and environmental costs, on the one hand and the enterprises value added on the other hand.

5. Using an element of the accounting method - reporting. This stage is the most important, because the formation of integrated reporting. A derivative element of the accounting method is formed - forecasting future activities in the vector of sustainable development.
6. The final conclusion formation. Theory evaluation:
   1) direct and inverse dependence of the enterprises added value on the differentiated size of social and environmental costs;
   2) confirmation of existence a new accounting method - forecasting;
   3) the need to form and issue of sustainable development reporting (integrated reporting) by small enterprises;
   4) the ability of the Accounting Institute to become a means of achieving sustainable development by using the new methods: forecasting and integrated reporting.

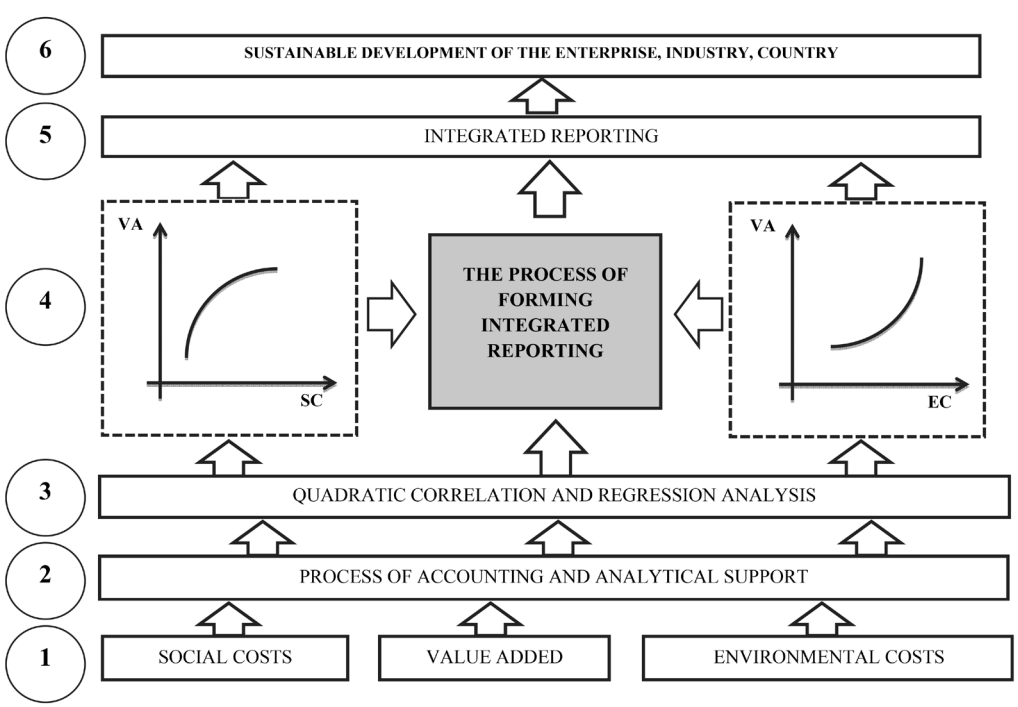
After a thorough analysis of studies of the direct and inverse quadratic dependence of social/environmental costs and value added, we analyze the dependence of these costs in the value added of enterprises in Ukraine and Germany. These enterprises are divided into 4 groups: micro, small, medium and large enterprises in accordance with Ukrainian law (The Verkhovna Rada of Ukraine, 2017) and German standards (Destatis, 2020). Categorization is determined by compliance with at least two of the criteria presented in Table 1.

The research methodology (Figure 1) includes the process of accounting and analysis of information for the formation of integrated reporting, which contribute to the creation of a positive

Table 1:
Categorization of Ukrainian and German companies based on assessed book value, net income and number of employees

Enterprise category	Annual balance sheet total (million EUR)		Annual turnover (million EUR)		Annual work unit (AWU)	
	Ukraine	Germany	**Ukraine**	Germany	**Ukraine**	Germany
Micro	≤ 0.35	≤ 2	≤ 0.7	≤ 2	< 10	< 10
Small	≤ 4	≤ 10	≤ 8	≤ 10	< 50	< 50
Medium	≤ 20	≤ 43	≤ 40	≤ 50	< 250	< 250
Large	> 20	> 43	> 40	> 50	> 250	> 250

Source: Compiled by the authors based on data by State Statistic Service of Ukraine (2020), The Verkhovna Rada of Ukraine (2017) and Destatis (2020)



Note: VA - value added, SC - social expenses, EC - environmental costs.

Figure 1:
Research methodology
Source: Compiled by the authors

image and sustainable development of the enterprise. With the help of a quadratic analysis of social and environmental costs in relation to the added value of the enterprise, it becomes possible to further analyze and create integrated reporting. The reporting process encourages the company to move to a new stage of its activity - sustainable development.

5. Results

The current legal framework requires only large enterprises to generate integrated reporting, while medium-sized enterprises are allowed to generate this reporting without non-financial indicators (The Verkhovna Rada of Ukraine, 2017). By analyzing reporting data, we investigate the need for the adoption of integrated reporting in full for medium and small enterprises as well.

5.1. Regression analysis of social expenditures and value added of Ukrainian and German enterprises

An analysis of the social costs of enterprise value added is presented in the Figures 2 and 3.

For the analysis, we used the data of social expenditures and value added of Ukrainian enterprises with various sizes for 2011-2019. It is worth noting that the strongest correlation dependence of the two indicators for medium and small-sized enterprises was described with correlation coefficients of 0.9702 and 0.9032, respectively. These coefficients demonstrate a dependence of the formation of the enterprise added value due to social expenses.

Results of Figure 2 indicate a reverse U-shaped curve, which can be interpreted as follows. First, insignificant increase social expenditures at the beginning lead to a rapid increase in the added value of enterprises (the marginal growth rate of added value is larger than that of social expenditures). Second, the point is reached where the accumulated social expenditures begin to slow down the growth rate of value added of enterprises. The rate of value added is thus decreasing to fall below the starting level at the beginning of the formation and implementation of social spending.

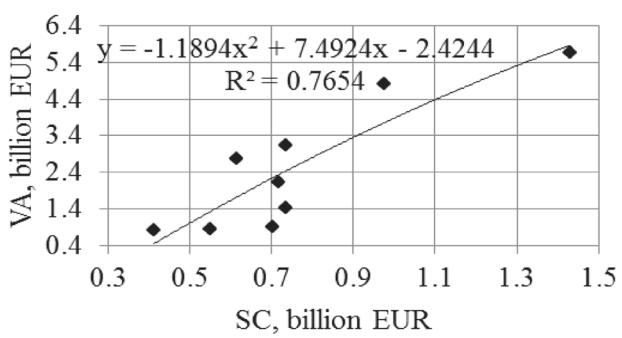


Figure 2.1. Microenterprises

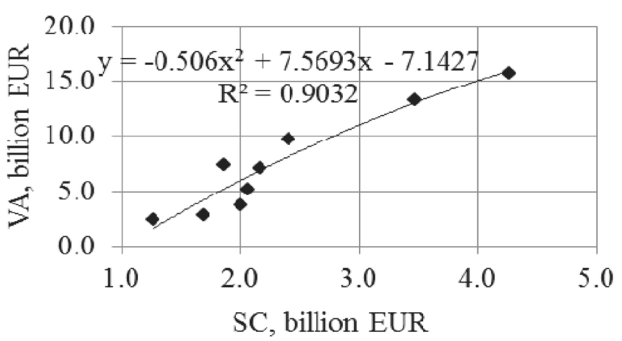


Figure 2.2. Small enterprises

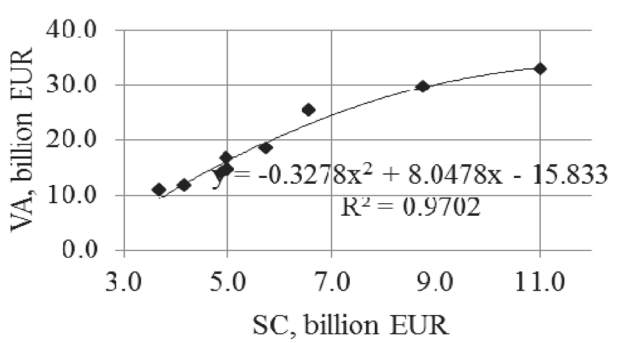


Figure 2.3. Medium enterprises

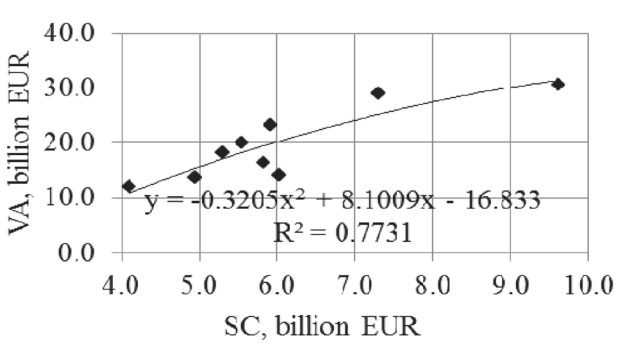


Figure 2.4. Large enterprises

Note: SC - social costs, VA - value added.

Figure 2:
The inverse U-shaped quadratic dependence of value added on the social costs of Ukrainian enterprises in 2011-2019
Source: Calculated by the authors based on data by State Statistic Service of Ukraine (2020)

Almost the same situation exists for German enterprises, in particular for micro and small enterprises (Figure 3). The trend line for medium and large enterprises is U-shaped, which slightly violates the regularity of Ukrainian enterprises.

Preliminary finding 1: social costs must be controlled and enterprises should find such a trait and size that the maximum value added of the enterprise.

5.2. Regression analysis of environmental expenditures and value added of Ukrainian and German enterprises

An analysis of the environmental costs of Ukrainian enterprise value added is presented in Figure 4.

Analysis of Figure 4 demonstrates a U-shaped quadratic dependence of value added on environmental costs of Ukrainian enterprises. Analyzing the data of the correlation coefficient of micro and small enterprises (0.9893 and 0.9781, respectively), we observe that value added is significantly dependent on environmental costs. Less pronounced, but still high dependence can be observed in medium and large enterprises (0.8946 and 0.8734, respectively). The U-shaped trend line suggests that at the initial stages of environmental costs, the smallest increase in value added occurs. However, with the accumulation of relevant costs and the creation of appropriate conditions and means of eco-protection, there is an increase in the rate of added value, and accordingly, the position of sustainable development is strengthened.

An analysis of the environmental costs of German enterprise value added is presented in Figure 5.

Almost the same situation exists for German enterprises and environmental cost, in particular for micro and small enterprises (Figure 5). The trend line has a downward direction. This may mean that the more environmental safety costs arise, the lower the added value for German enterprises. Moreover, this trend line decreases absolutely and there is no decrease in growth rates as for Ukrainian enterprises (Figure 4).

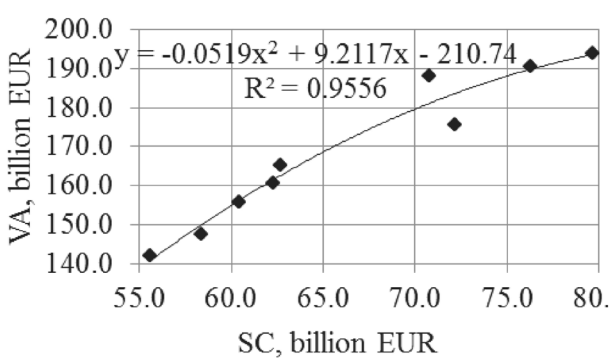


Figure 3.1. Microenterprises

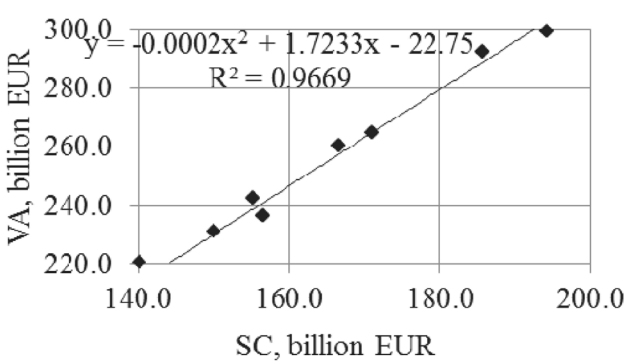


Figure 3.2. Small enterprises

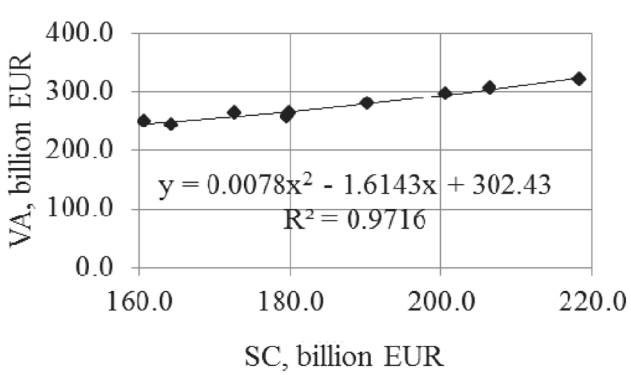


Figure 3.3. Medium enterprises

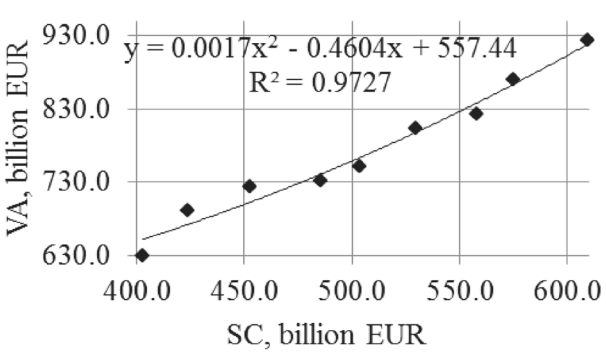


Figure 3.4. Large enterprises

Note: SC - social costs, VA - value added.

Figure 3:
The inverse and U-shaped quadratic dependence of value added on the social costs of German enterprises in 2011-2019
Source: Calculated by the authors based on data by Destatis (2020)

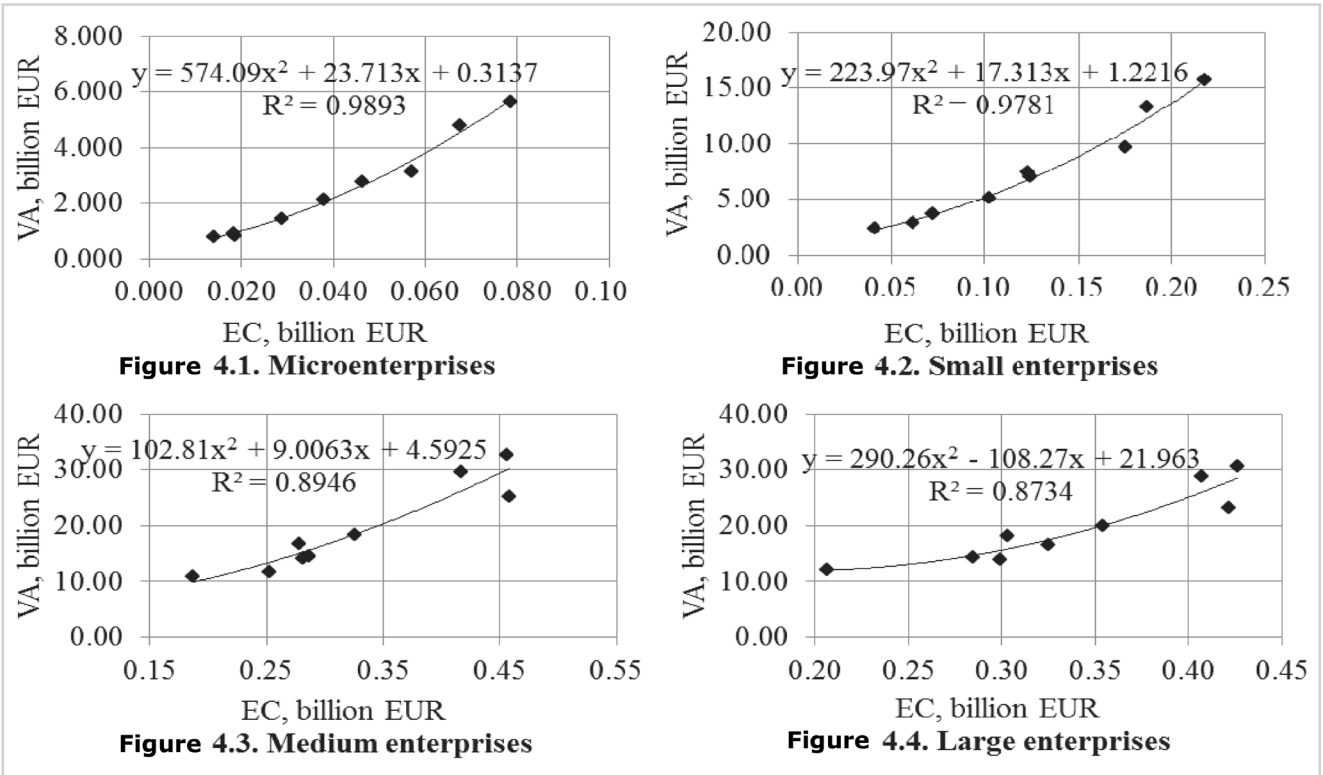


Figure 4.1. Microenterprises

Figure 4.2. Small enterprises

Figure 4.3. Medium enterprises

Figure 4.4. Large enterprises

Note: EC - environmental costs, VA - value added.

Figure 4:
U-shaped quadratic dependence of value added on the environmental costs of Ukrainian enterprises in 2011-2019
Source: Calculated by the authors based on data by State Statistic Service of Ukraine (2020)

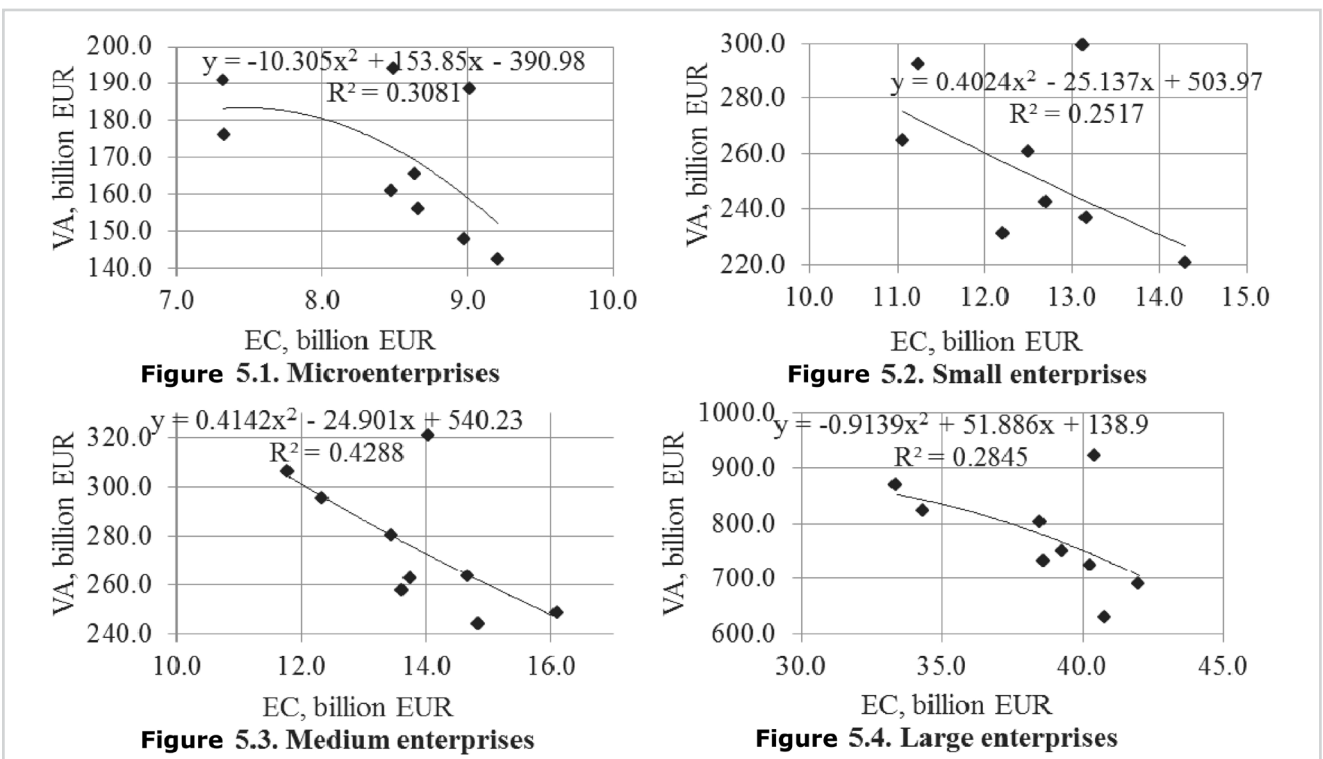


Figure 5.1. Microenterprises

Figure 5.2. Small enterprises

Figure 5.3. Medium enterprises

Figure 5.4. Large enterprises

Note: EC - environmental costs, VA - value added.

Figure 5:
The inverse and U-shaped quadratic dependence of value added on the environmental costs of German enterprises in 2011-2019
Source: Calculated by the authors based on data by Destatis (2020)

Preliminary finding 2: a powerful impulse for sustainable development is possible with the accumulation of an appropriate base of eco-fixed assets. There is a direct dependence of value added on eco-expenditures, especially at the first stages of capital investment and current eco-expenditures.

5.3. The moderating role of IR

The publication of an integrated report facilitates investors' appraisal of the financial value contribution of social and environmental expenditures. With regard to the effect of IR itself, the paper finds a significant positive association between firms publishing an integrated report and firm value consistently over all company sizes.

This paper finds a significant association with firm value added for the interaction term of the squared aggregated environmental expenditures. Error rate is $p<0.05$ (for Ukrainian and German enterprises) and it confirms *the disclosure of an integrated report positively moderates the quadratic association between environmental expenditures and firm value added.*

Nevertheless, the contribution of in integrated report to the company value is positive only for those companies with low environmental protection costs or for those who pursue an active environmental strategy with a large volume of environmental protection costs (vertical form areas) (the rule of U-shaped curves). In these cases, the IR needs to justify to investors why the firm invests a little or a large amount of resources in social and environmental activities. By investing little or nothing in environmental activities, IR could harm a firm's reputation. Companies with an active environmental strategy can use IR to explain how high environmental costs benefit the company. Firms who dedicate a moderate amount of resources to environmental social and activities have a lower contribution to the firm value added when publishing an integrated report than firms that do not publish a report at all. Thus, the cost of publishing an integrated report seems to outweigh the benefits of explaining the need for environmental costs (horizontal area) (Figure 6).

The analysis of the squared social expenditures shows that the aggregated social expenditures (error rate is $0.009<p<0.10$) are moderated by IR. Thus, *the disclosure of an integrated report positively moderates the quadratic association between social expenditures and firm value.* Figure 7 plots the association between the aggregated social expenditures and firm value with and without the moderation of IR. There is a significant moderation effect through IR and solely a significant positive firm value contribution for all firms publishing an integrated report, the inverse U-shaped curve is shifted upwards parallelly.

Overall, IR seems to soften the link between environmental costs and firm value added, but not for social costs and firm value added. Technical knowledge may be required to understand the economic impact of environmental costs. Thus, without further explanation, the financial contribution of environmental expenditures is uncertain. In contrast, additional explanations are not required for social expenditures, as investors may expect certain social expenditures from the company to obtain an activity license. Social costs can be seen as a legitimate aspect of CSR, which investors can be interpreted well without publishing an integrated report.

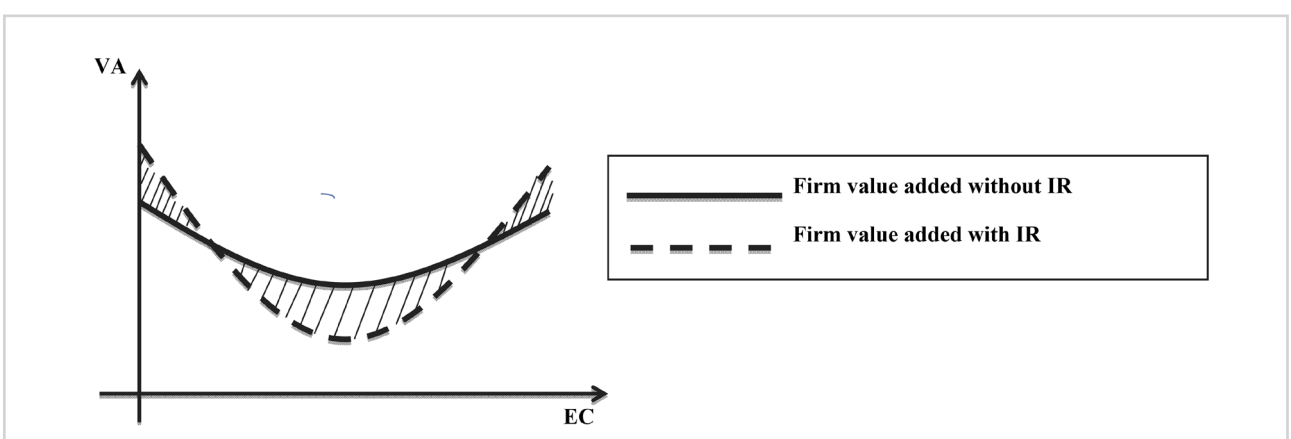


Figure 6:
The model of U-shaped relationship («too little of a good thing») between environmental expenditures (EC) and firm value added (VA), with and without moderation by IR
Source: Compiled by the authors

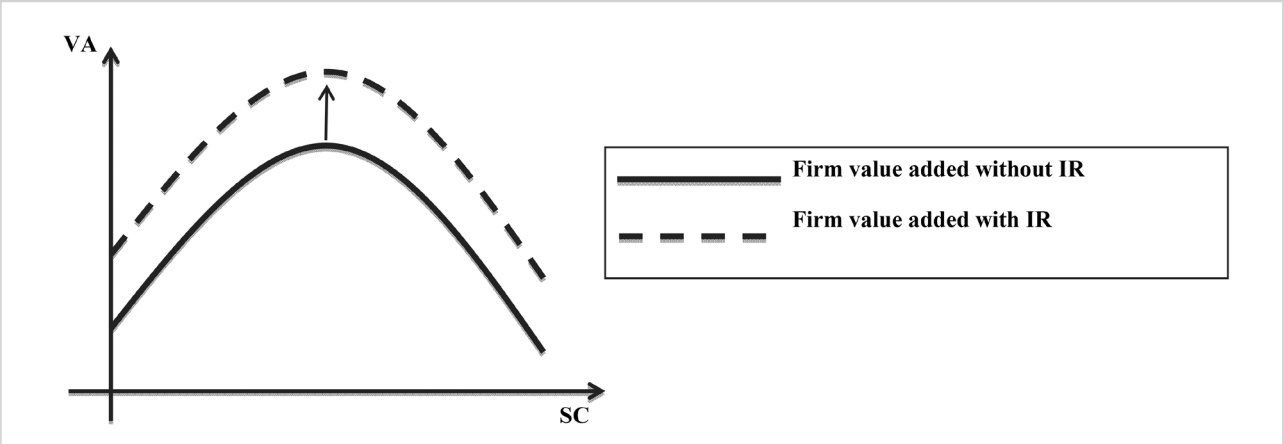


Figure 7:
The model of inverted U-shaped relationship («too much of a good thing») between social expenditures (SC) and firm value added (VA), with and without moderation by IR
Source: Compiled by the authors

6. Conclusions

This paper seeks to shed light on the effects of introducing and improving the practice of reporting on sustainable development. This was carried out by a mathematical analysis of the quadratic correlation and regression dependence of the added value of enterprises on the size of social and environmental costs. For this, we develop hypotheses and test them on Ukrainian and German companies of various all sizes.

The results can be projected upon a significant U-shaped curve, which demonstrates the relationship between environmental costs and firm value added for Ukrainian and vice versa for German enterprises (micro and large enterprises). Social spending shows a significant inverted U-shaped relationship with firm value in Ukraine but large German enterprises drop out of this list. These results accord with the previously discussed views that a cost-related school and a value-creating school coexist. And the main focus should be aimed on quadratic models. Regarding the deterrent effect of IR, the results show that IR moderates the U-shaped relationship between environmental spending and firm value added, but not social spending and firm value added.

This paper's contribution to research on integrated reporting and sustainable development is relevant for scholars and practitioners - managers and investors in particular. Managers should be aware that there is a minimum level of environmental protection costs necessary to create a positive value-added effect for the company. In this sense, companies who purse an active environmental strategy can benefit from integrated reporting. Managers should also be aware that there is a maximum of social costs after which the marginal added value decreases. The publication of an integrated report entails a positive impact on the value of the company, regardless of social costs. Investors may be interested in looking not only at the output of CSR variables (for example, ratings, CO_2 emissions and so on), but also at the input variables of CSR, such as the costs of CSR, to improve their investment situation.

The above models of the dependence of the added value of the enterprise on social / environmental costs and, accordingly, the level of sustainable development need to be interpreted carefully. The implication that managers should invest in an active environmental strategy thereby incurring environmental costs. In the context of social costs, there is mainly a direct correlation of expenses and sustainable development.

Based on the above conclusions, Ukraine and Germany could consider expanding mandatory integrated reporting beyond large and medium-sized enterprises. Small enterprises could also benefit from integrated reporting (according to some statements of EU countries, this should be mandatory). And this is the near future.

So, the general hypothesis of the ability of the Accounting Institute to ensure the sustainable development of entrepreneurship is confirmed. Moreover, accounting methods are reinforced with transformed integrated reporting. The objective of this reporting is not only a statement of facts but also forecasting. Now accounting is expanding its authority not only by stating the facts of socio-economic events, but also fulfils the function of forecasting and ensuring sustainable development.

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