

# How to Value Impact Startups – Towards a Taxonomy

Christin Eckerle<sup>1[0000-0001-8488-9772]</sup>, Sarah Manthey<sup>1[0000-0002-4221-0837]</sup>, and Orestis Terzidis<sup>1[0000-0001-7865-7190]</sup>

<sup>1</sup> Karlsruhe Institute of Technology, Fritz-Erler-Str. 1-3, 76133 Karlsruhe  
christin.eckerle@kit.edu

**Abstract.** In recent years, impact investing has aroused growing interest in science and practice. Particularly for startup financing, the topic promises sustainable innovation and therefore, high expectations exist for young ventures which address ecological and or social challenges within the investors' community and beyond. However, to date, there is little scientifically founded knowledge on how such startups can be valued based on their impact. By addressing this research gap, we contribute to a better understanding of impact investing in early-stage startups using a mixed-method approach. On that basis, we present the United Nation Sustainable Development Goals as the overarching framework and carry out an iterative process, to develop a theoretically sound taxonomy of the most important impact criteria to provide a better analysis of startups active in addressing societal problems. Further steps for this research in progress will be introduced and critically discussed together with limitations.

**Keywords:** Impact Investing, Taxonomy, Entrepreneurship, UN SDGs

## 1 Introduction

In recent years, sustainability has taken on an increasingly important role in entrepreneurship, as startups are seen as a crucial factor in addressing the grand challenges of our time [1], [2]. In academia, sustainability is widely understood as the means to achieve the Sustainable Development Goals (SDGs) proclaimed by the United Nations (UN) in 2015 [3]. From an investor's perspective, the importance to support sustainable innovation is increasingly apparent: According to a recent study by Pitchbook [4] in developed markets, sustainable investment strategies are set for at least 60 (North America) to 70 percent (Europe) of investors. A variety of concepts are available to include sustainability in the investment strategy, e.g., environmental, social, and governance (ESG) criteria [5], and global initiatives foster the measurement of these criteria [6]. With a variety of reporting criteria comes along a lack of a standardized valuation, which makes it difficult to compare companies or projects to date.

Impact investors specifically want to support projects which try to generate a positive and measurable impact for the common good alongside financial return [7]. Due to this focus, these investors need to consider different criteria to identify impact startups compared to other kinds of startups [8]. At an early company phase, i.e., from research and product conception, including company formation, to the start of operations, internal financing from sales is usually only possible to a limited extent for companies in these phases [9]. Thus, at this early-stage, startups that try to receive funding from impact investors have to fulfill certain aspects [10]. A major point thereby is what impact

criteria they should incorporate into their impact strategy to enable an analysis and comparison for the investor. This is up to date still unclear and not well researched. There are promising developments recognizable to enhance the measurement of the impact of startups, e.g., the DIN SPEC 90051-1 [11], or to measure the impact of startup support programs, e.g., the IMPACT Guide [12]. Still, they rather focus on qualitative reporting than concrete and comparable criteria. Therefore, this paper addresses the following research question: What are the most important criteria of early-stage impact valuation?

To answer this question, this research-in-progress paper presents the design process of a taxonomy development for impact valuation of early-stage startups. This paper aims to contribute to the growing research on the topic of impact investment in an entrepreneurial setting (see e.g., [13]). Its main contribution is the conceptual clarification and differentiation of impact compared to other concepts around sustainable entrepreneurship, as well as to bolster the operationalization of impact criteria. In practice, the results are of interest for impact investors that can use the developed taxonomy to better evaluate and compare startups that apply for their support.

## **2 Methodological Approach to Taxonomy Development**

The methodological approach follows the design science framework for taxonomy development proposed by Kundisch et al. [14] which builds on the seven-step method by Nickerson et al. [15]. This approach has been applied successfully in former design science research projects and is a common method in information systems (IS) research [16]. The taxonomy design recommendations by Kundisch et al. [14] incorporate the iterative process while putting an emphasis on the problem and solution space as well as the evaluation.

In the first iteration, a conceptual-to-empirical (i.e., deductive) approach is applied. Firstly, overarching dimensions and underlying criteria are conceptualized based on knowledge built from literature. Secondly, researchers examine objects for these characteristics to examine whether real-world objects occupy all criteria or if criteria need to be eliminated, re-fined, or added. The result after each iteration is a (revised) taxonomy that is followed by researchers reviewing ending conditions. The taxonomy development process continues with the next iteration until all ending conditions are met [16]. A final evaluation of the artifact should be conducted with regards to the 'usefulness for the intended users and the intended purpose' ([15] p.353 in [16] p. 4). As this paper is a research-in-progress report, currently the examination of real-world objects of the taxonomy is not yet included, hence, neither is the evaluation.

In this paper, the focus is on early-stage startup companies that try to apply for impact funding sources. For this reason, the "most important and projectable impact criteria of impact startups at early stage" were defined as a meta-criterion. Ending conditions for the taxonomy development are derived from literature and consist of objective as well as subjective conditions: every criterion has to be unique and not repeated, at least one object is classified under each criterion; all authors agree that the taxonomy was concise, robust, comprehensive, extendible, and explanatory [17]. Further

evaluation goals are identifying and analyzing the objects, compared to doing so without a taxonomy or other classification schemes, and lastly, the taxonomy will be communicated to the target groups [14].

### 3 Taxonomy Development for Impact Startups in Early Stage

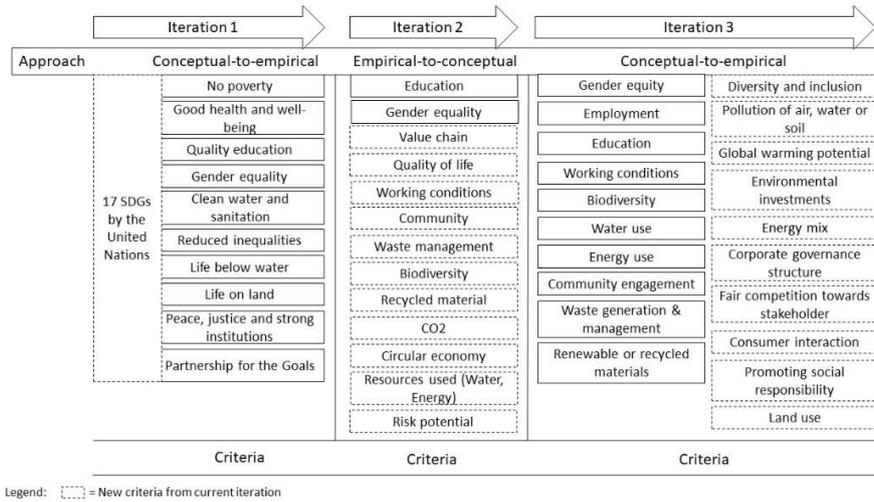
Multiple taxonomies in the realm of sustainable development already exist, usually including a focus on financial evaluation (see e.g., [18], [19]). Yet, the different classification foci and the high complexity make the applicability to young impact ventures difficult. Therefore, the proposed taxonomy in this research project for impact startups at an early stage is a necessary specification with the goal to identify and analyze impact startups.

With regard to the design science approach, the taxonomy was developed after an in-depth and systematic analysis of the state-of-the-art literature concerning impact investing in relation to entrepreneurship. In summary, the challenge of creating a universal framework with meaningful and comparable indicators that can be used by all impact actors and capture the true value of impact remains unresolved (see e.g., [20]). Furthermore, an impact assessment should be included as early as possible in the strategy of companies [21].

Based on this, the purpose and target group for the taxonomy were formulated, as described in section 2. Furthermore, the theoretical basis of this taxonomy was set on the UN SDGs [22], as these 17 goals represent the most urgent problems of our time and are universally significant [23]. In the first iteration, the 17 goals were utilized to analyze a quantitative data set of 200 impact intermediaries from around the (mainly western) world – included were e.g., investors, networks, accelerators, and incubators – which support impact startups. These intermediaries require specific criteria to be addressed by the startups that want to access their support. This is where the first conceptual-to-empirical iteration of the taxonomy development has started, to identify the most common impact criteria, i.e., the most common SDGs. In order to retrieve a minimized list, the SDGs identified by the aforesaid analysis were then analyzed based on their interrelationship with other SDGs, as it is urged to address more than one SDG at the same time, in the best-case socioeconomic goals alongside ecological goals [24]. The result led to ten remaining UN SDGs. Those function as the ground for the first set of impact criteria in the taxonomy development (see Fig 1., Iteration 1).

The second iteration was built on 10 semi-structured interviews with European-prone stakeholders that are experts on the impact measurement of startups. The interviewees included investors, entrepreneurs, startup accelerators, and independent experts. This was followed by an inductive data analysis [25] which was chosen to ensure the inclusion of all relevant categories and additional topics. Main topics were identified beforehand from 17 open interviews by identifying common patterns as well as opposing statements that showed a need for clarification. These were then used to develop the semi-structured interview guideline for the 10 subsequent interviews. The derived categories from the analysis of the semi-structured interviews led to the results of iteration two (see Fig. 1, Iteration 2).

In the current third stage, a conceptual-to-empirical step was again chosen to identify a scientifically proven yet practically projectable set of criteria. Based on the aforementioned findings, literature was scanned for the most common impact criteria in young company valuation. From that, a list of in total 20 criteria was derived (see Fig.1, Iteration 3). Some criteria were re-named from iteration 2 to 3, to minimize potential interdependencies, such as between “gender equity” (formerly gender equality) and “diversity and inclusion”, and some were made more granular, e.g., “value chain” into “fair competition towards stakeholders” and “promoting social responsibility”.



**Fig. 1.** Development Process of Criteria for Impact Valuation of Early-Stage Startups, own illustration.

In the next step, a survey with impact investors was conducted to determine (1) the relative importance of the 20 criteria; (2) the top criteria that are most frequently marked as "essential"; (3) the differences in the importance of the criteria related to whether the investor invests in emerging markets or developed markets, as in emerging markets, social issues should be more relevant, whereas, in developed markets, the focus could be more on environmental improvements [26]. Afterwards, the updated taxonomy will then be applied to real-world objects (i.e., impact startups at an early stage) to determine, if the taxonomy helps to identify and analyze impact startups that try to achieve systemic impact.

## 4 Discussion, Implications, and Further Research

The current state of the taxonomy development for early-stage impact valuation has shown first interesting findings while also bringing up open questions. Impact criteria for early-stage startups are strongly connected to the UN SDGs. Hence, impact criteria can be determined and broken down for early-stage startups based on this framework.

One problem though might be the difference in impact definition around the globe. The expert interviews have led to a more diverse and differentiated picture of criteria. Still, these have then found evidence in scientific literature. The next step will show if a clearer picture of the most important criteria for impact valuation in early-stage startups can be made. With more clarity on these criteria and their relevance, further research will focus on formulating measurements for the identified criteria. Of relevance in this regard are former studies, as they postulate an indicator system for measurement, yet not on impact but on output level, to evaluate the performance of companies in tackling societal and ecological problems [27], [28]. Lastly, an important step will be the evaluation of the taxonomy, as it will determine its usefulness and applicability. There are certain guidelines in IS research for taxonomy evaluation that will be followed [29]. To do so, the evaluation will be conducted by identifying and analyzing real-world objects, i.e., impact startups at an early stage, including impact investors in the application of the taxonomy (see [14]). Future research could again open up the lens to impact investments around the globe to determine if the taxonomy is applicable beyond the European investment market.

## References

1. Filser, M., Kraus, S., Roig-Tierno, N., Kailer, N., & Fischer, U.: Entrepreneurship as catalyst for sustainable development: Opening the black box. *Sustainability*, 11(16), 4503 (2019).
2. Schaltegger, S.: Sustainability as a driver for corporate economic success: Consequences for the development of sustainability management control. *Society and Economy*, 33(1), 15-28 (2011).
3. United Nations General Assembly: Transforming Our World: the 2030 Agenda for Sustainable Development, Resolution Adopted by the General Assembly on 25 September 2015, United Nations, New York (2015).
4. Pitchbook: Sustainable Investment Survey 2019. Retrieved from <https://pitchbook.com/news/reports/2020-sustainable-investment-survey> (2020).
5. Kölbel, J.F., Heeb, F., Paetzold, F., Busch, T.: Can Sustainable Investing Save the World? Reviewing the Mechanisms of Investor Impact. *Organization & Environment* 33, 554–574. (2020).
6. Giones, F., Ungerer, C., & Baltés, G.: Balancing financial, social and environmental values: Can new ventures make an impact without sacrificing profits? *International Journal of Entrepreneurial Venturing*, 12 (1), 39–57 (2020).
7. Li, F., Giochetta, G., & Mosca, L.: Impact Investing: How to Invest for Market-Rate Return and Measurable Impact at Large Scale — City, University of London. Retrieved from <https://www.city.ac.uk/news/2019/july/impact-investing-for-market-return-and-measurable-impact-large-scale> (2019).
8. So, I., & Staskevicius, A.: Measuring the ‘impact’ in impact investing. Harvard Business School (2015).
9. Achleiter, A.-K.: Early Stage, <https://wirtschaftslexikon.gabler.de/definition/early-stage-34501/version-258003>, last accessed 2022/03/18.
10. Block, J. H., Hirschmann, M., & Fisch, C.: Which criteria matter when impact investors screen social enterprises? *Journal of Corporate Finance*, 66, 101813 (2021).

11. DIN SPEC 90051-1-Konsortium: Nachhaltigkeitsbewertung von Start-ups – Das Praxistool der DIN SPEC 90051-1. Ein Anwendungsleitfaden für Kapitalgebende, Start-ups, Gründungsförderakteure und Bewertungsinstitutionen (2021).
12. Fichter, K. & Widrat, A.: Increasing the impact of start-up support: Policy brief on results and recommendations for action developed in the project “IMPACT of sustainability-oriented start-up support”. Berlin: Borderstep Institute (2021).
13. Barber, B. M., Morse, A., & Yasuda, A.: Impact investing. *Journal of Financial Economics*, 139(1), 162-185 (2021).
14. Kundisch, D., Muntermann, J., Oberländer, A., Rau, D., Roeglinger, M., Schoormann, T., and Szopinski, D.: An Update for Taxonomy Designers - Methodological Guidance from Information Systems Research, *Business & Information Systems Engineering* (2021).
15. Nickerson, R., Varshney, U. & Muntermann, J.: A method for taxonomy development and its application in information systems. *Eur J Inf Syst* 22, 336–359 (2013).
16. Oberländer, A. M., Lösner, B., & Rau, D.: Taxonomy research in information systems: a systematic assessment (2019).
17. Oberländer, A. M., Röglinger, M., Rosemann, M., & Kees, A.: Conceptualizing business-tothing interactions – A sociomaterial perspective on the Internet of Things. *European Journal of Information Systems*, 27(4), 486-502 (2018).
18. Bergset, L., & Fichter, K.: Green start-ups—a new typology for sustainable entrepreneurship and innovation research. *Journal of Innovation Management*, 3(3), 118-144 (2015).
19. Regulation (EU) 2020/852. (Taxonomy) on the establishment of a framework to facilitate sustainable investment, [https://ec.europa.eu/info/law/sustainable-finance-taxonomy-regulation-eu-2020-852\\_en](https://ec.europa.eu/info/law/sustainable-finance-taxonomy-regulation-eu-2020-852_en), last accessed 2022/01/18.
20. Clarkin, J. E., & Cangioni, C. L.: Impact investing: A primer and review of the literature. *Entrepreneurship Research Journal*, 6 (2), 135-173 (2016).
21. Courtney, P.: Conceptualising social value for the third sector and developing methods for its assessment. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 29 (3), 541–557 (2018).
22. United Nations: Transforming our World: The 2030 Agenda for Sustainable Development, <https://sdgs.un.org/publications/transforming-our-world-2030-agenda-sustainable-development-17981>, last accessed 2022/01/19 (2015).
23. SDGs UN Homepage, <https://sdgs.un.org/goals>, last accessed 2022/01/19.
24. Collste, D., Randers, J., Goluke, U., Stoknes, P. E., Cornell, S., & Rockström, J.: The Empirical Bases for the Earth3 Model: Technical Notes on the Sustainable Development Goals and Planetary Boundaries (2018).
25. Mayring, P.: Qualitative content analysis: theoretical foundation, basic procedures and software solution (2014).
26. OECD: Business Insights on Emerging Markets 2021, OECD Emerging Markets Network, OECD Development Centre, Paris, <https://www.oecd.org/dev/emnet-emerging-markets-network.htm> (2021).
27. Ebrahim, A.; Rangan, V.K.: What impact? A framework for measuring the scale and scope of social performance. *Calif. Manag. Rev.*, 56, 118–141 (2014).
28. Crucke, S., & Decramer, A.: The development of a measurement instrument for the organizational performance of social enterprises. *Sustainability*, 8(2), 161 (2016).
29. Szopinski, D., Schoormann, T., & Kundisch, D.: Because Your Taxonomy is Worth It: Towards a Framework for Taxonomy Evaluation. In: Proceedings of the European Conference on Information Systems (ECIS), Stockholm-Uppsala, Sweden (2019).