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The social value of science and technology parks: a European perspective

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ABSTRACT

In recent decades, science and technology parks (STPs) have been contributing to regional development. Different metrics and methods of measuring have been proposed to calculate this positive contribution. In this study we propose in the first place a methodology to calculate the social value (SV) generated by organisations towards STPs. With the collaboration of the International Association of Science Parks and Areas of Innovation (IASP), we have created an initial pool (community) of fourteen European STPs who are interested in the topic of SV analysis to test this methodology. We have obtained preliminary results of the social value generated by those fourteen European STPs distributed per each of the relevant STP stakeholders. In addition, we have developed a more detailed study of the STPs located in the region of Lombardy (northern Italy), as a practical application of the methodology presented in the paper. The contribution of the paper to the STP literature is twofold: a new way of calculating the SV generated by STPs based on secondary data is presented, and empirical examples of this methodology are calculated in order to test that methodology.

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Science and technology park (STP); economic and social value; regional development; stakeholder theory

Introduction

The type of organisation known as science and technology parks (STPs) and its derivatives could be considered as innovation agencies: they take in ideas, help to develop them and support their transformation into enterprises and businesses (Fulgencio 2017; Lecluyse, Knockaert, and Spithoven 2019). They accompany new entrepreneurs or growing companies in their realisations. Although the first STPs were created in the early 1950s, they had to wait until the 1980s to flourish as part of the regional innovation policy of many governments. The success story of the first STPs (Stanford Research Park, Research Triangle) has increased the interest in STPs worldwide, with a growing number of STPs not only in Europe and North America, but also in Asia, Africa and Latin America (Lecluyse, Knockaert, and Spithoven 2019). Only in Europe, more than 750,000 people are directly employed in STPs (Rowe 2014).

Following this increase in the number of STPs, the debate about the contribution of STPs to society has started to attract more attention from both the academic community and policy

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makers (Albahari et al. 2023; Amaral, da Hora, and Schocair 2023; Lecluyse and Knockaert 2020). Traditionally, this contribution has been studied from an economic point of view, focusing on variables such as the number of jobs and firms created (Henriques, Sobreiro, and Kimura 2018). However, the measurement of the contribution of STPs is still under debate, with inconclusive results about their impact in society (Fulgencio 2017; Lecluyse and Knockaert 2020; Ng et al. 2019).

At the same time, there is a growing interest in the managing organisations of STPs and in regional policy makers to go beyond the traditional economic variables and also consider the value that STPs are generating for all their stakeholders and the society in the region. The aim of this recent insight is to better understand the connection between STPs and their contribution to regional development through the creation of social value for their stakeholders (Fulgencio 2017; Poonjan, Tanner, and Andersen 2022). The measurement of this new interest is starting to be gathered under the conceptual umbrella of social value (SV) (Fulgencio 2017; Lecluyse, Knockaert, and Spithoven 2019).

The assessment of the social value generated by STPs is still a field not fully clarified by academic literature, with continuous calls from researchers in the field to develop new tools or methodologies useful for practitioners and policy makers to measure SV in STPs and its distribution among their stakeholders (Fulgencio 2017; Lecluyse, Knockaert, and Spithoven 2019). Following this line, the research gap that this work will address is the lack of clear and useful tools and methodologies to measure the SV generated by STPs and its distribution among stakeholders.

In order to approach this gap, two research questions will be considered. In the first place, and in accordance with the calls made by Lecluyse, Knockaert, and Spithoven (2019) and Lecluyse and Knockaert (2020), we will consider the question about the feasibility of constructing a clear methodology to measure SV in STPs, useful for practitioners and policy makers. Research question 1 reads like this: Is it possible to develop a clear and useful methodology to measure SV in STPs? Secondly, and following the calls made in other academic studies (Fulgencio 2017; Lecluyse and Knockaert 2020), we will analyse how to measure the distribution of SV among the STPs stakeholders. Research question 2 reads like this: Is it possible to categorise the SV generated by STPs among their stakeholders? Figure 1 shows the connections between the research gap, the research questions, the knowledge base, and the original contribution of this work.

In order to answer the research questions, we use concepts taken from the field of SV measurement and stakeholder theory. In particular, we refer to the polyhedral model of SV analysis (Social Polyhedral Model – SPOLY) (Aguado and Eizaguirre 2020). From this perspective, we participate of the discourse of the new business narrative (NBN) based on the stakeholder theory, with the aim of developing methodologies and techniques that allow to quantify (monetise) the value generated and distributed to the various stakeholders of an organisation (in this case, STPs) (Freeman, Retolaza, and San-José 2020). The polyhedral model, as an accounting information system, allows to map and monetise the SV generated for each stakeholder group by the companies which populate STPs (Retolaza et al. 2015; Retolaza, San-José, and Ruíz-Roqueñi 2016b). In addition, the entire model is based on the methodological principles of added value analysis established by the Association of Accounting and Management in Spain (AECA) (Gonzalo and Perez 2017), which is a partner entity of the International Association for Accounting Education & Research (IAAER).

Although there are several works that demonstrate the applicability of this methodology to different sectors (Ayuso et al. 2020; Mendizabal, San-José, and García 2022; San-José, García-Merino, and Retolaza 2023), there is currently little evidence in SV analysis applied to the context of STPs (Fulgencio 2017; Torres-Pruñonosa, Raya, and Dopeso-Fernández 2020).

In this regard, a seminal experiment was conducted in 2020, in which Blazquez, Aguado, and Retolaza (2020) proposed a possible adaptation of the polyhedral model to be applied in the monetisation of the SV generated by STPs and its distribution among their stakeholders.

In this paper we will systematise the aforementioned tool, so that it could be possible to measure the SV generated by a multiplicity of STPs using almost only secondary data available from open sources (the ORBIS database, from Bureau Van Dijk – a Moody's Analytics Company). In addition,

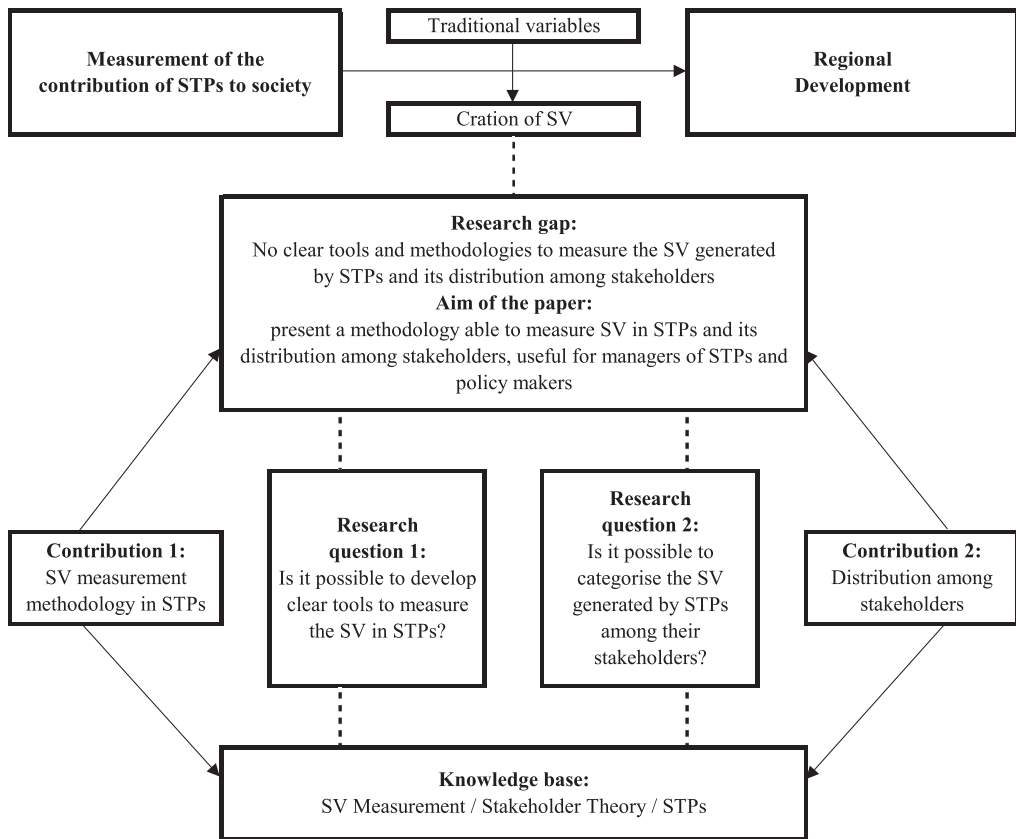


Figure 1. Research overview – bridging the gap with key questions and contributions. *Source:* Own elaboration.

we will calculate the distribution of that SV among the main stakeholders of STPs. In order to do so, we have opted for a measurement of the SV generated by 14 different European STPs, with a special focus on three Italian STPs located in the region of Lombardy. This line of research follows the path of several recent studies regarding Italian STPs (Bigliardi et al. 2006; Corrocher, Lamperti, and Mavilia 2019; Corsaro and Cantù 2015; Lamperti, Mavilia, and Castellini 2017; Liberati, Marinucci, and Tanzi 2016), but adding the SV perspective. The intention with those quantifications is to contribute at the debate of how to measure the value generated from STPs to society and its distribution among stakeholders, as highlighted by Lecluyse, Knockaert, and Spithoven (2019) and Fulgencio (2017).

The original contribution of this study has two main lines of work. On one hand, this work will present a new methodology to calculate the SV of STPs using mainly secondary data. In this line, our contribution is able to answer the research gap identified by the literature review, and also it answers to research question 1 (see Figure 1). On the other hand, this methodology is able to categorise the SV generated by STPs and to show how it is distributed among the main stakeholders of STPs. This second contribution answers the second part of the research gap and also research question 2 (see Figure 1). This methodology presents to both managers of STPs and policy makers relevant information about the capacity of STPs to create SV and how this SV is distributed among stakeholders. This information allows managers and policy makers to assess if the value generation of STPs and its distribution is aligned with the ultimate goals and purpose of STPs. In short, the aim of this study is to present a methodology able to measure SV in STPs and its distribution among stakeholders, useful for managers of STPs and policy makers in the process of comparing the purpose of a given STP and actual SV (and its distribution) achieved.

This paper is divided into four sections. After the introduction, the characteristics of the methodology to measure SV applied to STPs are explained. Thereafter, we describe the results of the quantitative analysis that is focused on the Italian STPs and the comparison with the group of the fourteen European ones. This analysis will serve also to test the methodology and the two research questions. We conclude with a section to gather conclusions and limitations of this study.

Methodology for measuring SV

Setting sample and data collection

STPs participating in this study were taken from a preliminary database that was established at the European level, in cooperation with IASP; the aim was to create a pool (community) of STPs interested in the topic of SV analysis, with whom the methodology could be tested. This experimental initiative was launched in 2021 and is still ongoing. For the creation of this learning community, IASP members (STPs) located in Europe were involved through a call for voluntary participation. The internal IASP call led to a thematic discussion among the community of STPs in Europe. Once expressions of interest were received from STPs managers, the applications were analysed. To apply the methodology, basic data were needed, namely STP's list of established entities with their names, European value-added tax (VAT) identification numbers and the number of employees of each company in the STP (Blazquez, Aguado, and Retolaza 2020). For a variety of reasons (e.g. a lack of data required to participate in the study, internal regulations prohibiting the sharing of data and information, etc.), not all applications could be accepted, resulting in an initial community of 14 analysable STPs, distributed over six countries (see Table 1) and twelve regions. In this study, we consider all 14 STPs and focus on the three Italian ones (located in the Lombardy region) of this community. We decided to focus with this preliminary study on Lombardy, because firstly we have three STPs in the same region (see Table 1), secondly because it is one of the leading regions in Italy in terms of innovation and economic development (European Commission, Directorate-General for Research and Innovation 2022), and finally because there is a high concentration of STPs in the region (Corrocher, Lamperti, and Mavilia 2019), including some that are considered as references in the Italian context (Liberati, Marinucci, and Tanzi 2016).

Methodology and analysis

The methodology of this research is developed in four steps. In this process the SV generated by STPs and distributed among stakeholders is calculated, monetised and analysed.

Table 1. Initial community of 14 STPs interested on SV analysis.

STP name	Country	Region
UC3M Science Park – LEGANÉS TECNOLÓGICO	Spain	Madrid
Parque Científico y Tecnológico de Tenerife	Spain	Canary Islands
Parque Científico y Tecnológico de Bizkaia	Spain	Basque Community
Parque Científico Tecnológico de Gijón	Spain	Principality of Asturias
Parque Tecnológico de Galicia	Spain	Galicia
Ciudad Politécnica de la Innovación (Valencia)	Spain	Valencian Community
OpenZone	Italy	Lombardy
ComoNExT	Italy	Lombardy
KilometroRosso	Italy	Lombardy
Madan Parque de Ciencia	Portugal	Lisboa
TECMAIA Perque de Ciencia e Tecnologia de Maia	Portugal	Porto
Linköping Science Park	Sweden	East Middle Sweden
NOVI	Denmark	Nordjylland
University of Warwick Science Park	England	Warwickshire

Source: Own elaboration.

Monetisation of SV

The method used to calculate the SV generated by STPs in this work is an adaptation of the polyhedral model for SV analysis (Blazquez, Aguado, and Retolaza 2020; Retolaza, San-José, and Ruíz-Roqueñi 2016b).

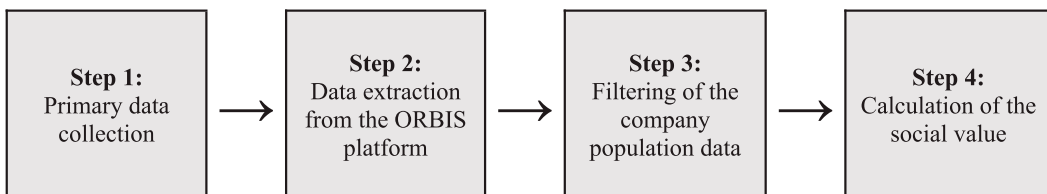
The model involves the reconstruction of the SV generated by companies/organisations established in the analysed STPs for the main stakeholders (i.e. customers, workers, suppliers, public administration, shareholders, financial entities), using the accounting information of the individual entities that make up the community of companies and organisations in each park. This approach allows us to work predominantly with secondary data, figures from balance sheets and the profit and loss accounts. It is an effective, efficient and minimally invasive methodology in terms of the direct involvement of park entities (i.e. companies and organisations). In this case, we have worked with a single initial primary data document provided by the park manager (i.e. a list containing the names of the companies/organisations established within the STP, the corresponding European VAT numbers and the number of employees operating at the company/organisation's premises in the analysed park).

The procedure is summarised in [Figure 2](#):

Regarding the measurement of SV in the community of 14 STPs, the following steps were taken:

Step 1: primary data collection. The primary data used were those collected by IASP as part of the initiative at the European level (i.e. the information on the companies/organisations settled in the park provided by the manager). Therefore, a dataset was set up containing the list of established entities for each STP with their names, VAT numbers and number of employees in the park.

Step 2: data extraction from the ORBIS platform. Thanks to the initial dataset (particularly company names and VAT numbers), it was possible to operate on the ORBIS platform by identifying the registered entities and extrapolating the data necessary to apply the methodology for calculating and monetising the SV for each of them. In this regard, both financial and control information was extrapolated to proceed with the selection phase of the entities that could be analysed for each STP. The following [Table 2](#) displays the primary accounting information and certain data utilised for control purposes.



Notes:

- Step 1: Primary data collection

Data needed: 1) Name of each company at the STP, 2) European VAT identification number, 3) Number of employees at the company's workplace at the STP.

- Step 3: Filtering of company population data

Criteria: 1) State of company activities, 2) Data availability, 3) Obsolete data, 4) Availability of total nr. of employees and nr. of workers at the STP, 5) Completeness of accounting data, 6) Data distortion.

Figure 2. Social value (SV) monetisation process in the context of STPs. *Notes:* Step 1: Primary data collection. Data needed: (1) Name of each company at the STP, (2) European VAT identification number, and (3) Number of employees at the company's workplace at the STP. Step 3: Filtering of company population data. Criteria: (1) State of company activities, (2) Data availability, (3) Obsolete data, (4) Availability of total number of employees and number of workers at the STP, (5) Completeness of accounting data, and (6) Data distortion. *Source:* Own elaboration based on Blazquez, Aguado, and Retolaza (2020).

Table 2. ORBIS platform – financial and control information.

Financial information		Control information	
Information/data ORBIS nomenclature	Purpose	Information/data ORBIS nomenclature	Purpose
Sales th EUR Last avail. Yr	Calculation – SV customers	Company name	Control and company identification
Added value th EUR Last avail. Yr	Calculation – SV suppliers	European VAT number	Company identification and tracking
Costs of employees th EUR Last avail. Yr	Calculation – SV employees and public administration	NACE Rev. 2, core code (4 digits)	Cross-check company and sector
Taxation th EUR Last avail. Yr	Calculation – SV public administration	Status	Identification of the activity status of the holding (step 3 key information)
P/L after tax th EUR Last avail. Yr	Calculation – SV shareholders	Standardised legal form	Identification of the obligation to present accounts
Depreciation & Amortisation th EUR Last avail. Yr	Calculation – SV retention	Last avail. year	Identification of the accounting information obsolescence (step 3 key information)
Financial expenses th EUR Last avail. Yr	Calculation – SV financial entities	Number of employees Last avail. Yr	Identification of the organisation size (step 3 key information)
Financial revenue th EUR Last avail. Yr	Calculation – SV financial entities	Capital th EUR Last avail. Yr	Control and plausibility of the accounting data
Operating revenue (turnover) th EUR Last avail. Yr	Calculation and control – SV customers	Fixed assets th EUR Last avail. Yr	Control and plausibility of the accounting data

Notes: th EUR Last avail. Yr = thousands of EUROS and last available year. SV = social value.

Source: Own elaboration based on Blazquez, Aguado, and Retolaza (2020).

According with Blazquez, Aguado, and Retolaza (2020), as illustrated in the left column (refer to Table 2), basically a total of eight key items have been identified within the Balance Sheet and Profit and Loss Account, which are crucial for assessing and estimating the Social Impact of Economic Activity (SIEA). These items are: ‘Sales’, ‘Added value’, ‘Cost of employees’, ‘Taxation’, ‘P/L (Profit/Loss) after tax’, ‘Depreciation & Amortisation’, ‘Financial expenses’ and ‘Financial revenue’. Additionally, the ninth item, namely ‘Operating Revenue (Turnover)’, is instrumental in cross-referencing with sales figures to validate the overall economic situation of the company.

The selection of these specific items was conducted meticulously, considering all fields in various repositories in ORBIS. The decision was made to extract accounting data from the repository named ‘Financial Data – Global Standard Format – Corporate – Balance Sheet and Profit Loss Account’. The criteria used for this selection were based on the level of completeness of data provided by companies and their relevance in deriving values for calculating the social impact for six main stakeholders: workers, suppliers, customers, shareholders, financial entities, and public administration. Furthermore, it is important to note, as indicated in the table above, that the values extracted for individual accounting items pertain to the latest available accounting year. This decision was made to account for a reasonable time lag in the companies’ valuation processes. On the right side of the table, you can find data points extracted from ORBIS, constituting essential control information related to a company. These data serve the dual purpose of identifying the company (e.g. Company name, European VAT number) and aiding in the selection or exclusion process during step three (e.g. Status, Last available year, Number of employees), as will be addressed in the subsequent section.

Step 3: filtering the company population. In this step, as defined by the method, the criteria for selection of the final sample of analysable entities were applied to the dataset, complete with the information extracted from ORBIS, as follows:

- (1) State of company activity.
- (2) Data availability.
- (3) Obsolete data.

(4) Presence of information on employees: on the one hand, the number of workers established in the STP (data provided by STP manager) and on the other hand, the total number of workers in the company/organisation (data extrapolated from ORBIS).

(5) Completeness of accounting data.

(6) Data distortion.

The entity (company established in the STP) had to be active to be selected. It needed to have accessible, complete and up-to-date data in the period of 2016–2019. There had to be no distortion in the financial data. An analysis with data until 2019 was opted for, to avoid the effect of the COVID-19 pandemic arising in 2020.

Step 4: calculation of SV. Once the process of selecting the entities eligible for the analysis had been concluded and a complete dataset with accounting information had been created, it was possible to proceed with the adaptation of the method to the European STP context and the resulting application of the calculation, based on an adaptation of the seminal work of Blazquez, Aguado, and Retolaza (2020). To adapt the calculation proxies to the European STP context, tax payment information from the World Bank Group's (2020) country reports was used. As shown in the following table (Table 3), using the accounting values from ORBIS platform (see Table 2) it is possible to calculate the SV for each stakeholder.

Table 3 presents the calculation proxies used to estimate the SV for each stakeholder. To standardise tax percentages across different countries in the study, reliance was placed on the National Doing Business Report (World Bank Group). The calculation procedure outlined in Table 3 can potentially be applied to all STPs in Europe.

For specific stakeholders, such as customers, shareholders, and the company itself, the SV corresponds directly to specific accounting items associated with them. For customers, the SV is equivalent to the company's sales ($Sales_{ORBIS}$). For shareholders, it corresponds to the company's net operating result (P/L after tax_{ORBIS}), and for the company itself, it is the amount of depreciation (Depreciation & Amortisation $_{ORBIS}$) (Retolaza, San-José, and Ruíz-Roqueñi 2016b).

However, for the remaining four stakeholders, namely financial entities, suppliers, public administration, and employees, the SV needs to be estimated using proxies. For financial entities, both the company's financial revenue (Financial revenue $_{ORBIS}$) and financial expenses (Financial expenses $_{ORBIS}$) are considered as absolute values, recognising that both inflows and outflows

Table 3. Social value calculation.

Stakeholder	Code	Calculus/Proxy – Social Value (SV)
Customer	SV-C	$SV-C = Sales_{ORBIS}$
Supplier	SV-S	$SV-S = (Sales_{ORBIS} - Value\ Added_{ORBIS}) * 43\%$
Public administration	SV-PA	$SV-PA = \sum (O-VAT; O-VAT; O-SSC; E-SSC) + If(O-TAX > 0)$
VAT	O-	$O-VAT = Value\ Added_{ORBIS} * \%VAT_{DB_National\%}$
VAT induced supplier	S-VAT	$S-VAT = (SV-S * \%VAT_{DB_National\%})/43 * 100$
Employer paid – social security contributions	O-SSC	$O-SSC = Costs\ of\ employees_{ORBIS} * \%O-SSC_{DB_National\%}$
Employee paid – social security contributions	E-SSC	$E-SSC = Costs\ of\ employees_{ORBIS} * \%E-SSC_{DB_National\%}$
Taxation	O-TAX	$O-TAX = Taxation_{ORBIS}$
Employees	SV-E	$SV-E = Costs\ of\ employees_{ORBIS} * (1 - \%E-SSC_{DB_National\%} - \%O-SSC_{DB_National\%})$
Shareholders	SV-Sh	$SV-Sh = P/L\ after\ tax_{ORBIS}$
Financial entities	SV-FE	$SV-FE = \sum ASS\ (Financial\ expenses_{ORBIS}; Financial\ revenue_{ORBIS})$
Organisation	SV-O	$SV-O = Depreciation\ \&\ Amortisation_{ORBIS}$
Total SV:	SV-T	$SV-T = \sum (SV-C; SV-S; SV-E, SV-PA, SV-Sh, SV-FE, SV-O)$

Note: The origin of the data is denoted as a subscript: 'ORBIS' if it represents an accounting value from the ORBIS platform and 'DBNational%' if it is a percentage extrapolated from the specific national Doing Business report.

Source: Own elaboration based on Blazquez, Aguado, and Retolaza (2020).

contribute to the value created for financial institutions. To estimate the value generated for suppliers, we developed a proxy based on Retolaza, San-José, and Ruiz-Roqueñi (2016a) due to the lack of available data to reconstruct the company's added value or accounting information on the cost of supplies. Regarding the SV generated for the public administration, it consists mainly of five elements: the company's own value-added tax (O-VAT), the value-added tax induced to suppliers (S-VAT), the social contributions paid by the company on the wage bill (O-SSC), the social contributions paid by employees (E-SSC), and taxes paid by the company (O-TAX). The total SV estimated for the public administration is the sum of the first four elements, plus a fifth element in case of a positive value. For this proxy, a timeless analysis was conducted, not discounting the negative value of taxes due from the total SV calculation for the public administration. If a longitudinal analysis were to be performed, the carry-over of negative values between different years would need to be considered.

Worth noting is the fact that for taxes paid, reference is made to the book value declared by the company ($Taxation_{ORBIS}$). Social security contributions, both paid by the company (O-SSC) and employees (E-SSC), are calculated based on the specific percentage in the country where the STP is located, applied to the wage bill ($Costs\ of\ employees_{ORBIS}$). In contrast, the value-added tax paid by the enterprise is calculated by applying the national tax rate ($VAT_{DB_National\%}$) to the amount of value-added declared by the enterprise ($Value\ Added_{ORBIS}$). To estimate the value-added generated by the economic activity within the supply chain, we use a proxy based on Retolaza et al. (2015), assuming a calculation of the value-added tax based on the SV generated for suppliers (SV-S) through the national tax rate ($VAT_{DB_National\%}$) while reporting the value at 100% (see Table 3).

Finally, the SV generated for employees is essentially the wage bill indicated by the company ($Costs\ of\ employees_{ORBIS}$), minus the social security contributions paid by both the employer (O-SSC) and the employees themselves (E-SSC), which are already included in the SV calculated for the public administration. At the end of the table is provided the complete formula for the direct calculation.

Results

In this section we answer in a positive way the two research questions that were highlighted in the introduction: it is possible to develop a clear and useful methodology (for managers of STPs and policy makers) to measure SV in STPs, analysing at the same time how this SV is distributed among stakeholders. At the same time, the results shown in this section provide both the aim and the original contribution of this study, presenting a methodology able to measure SV in STPs categorised by stakeholder (see Figure 1).

As indicated previously, three Italian (Lombardy region) STPs were analysed in this qualitative phase, along with 11 additional STPs from the rest of Europe, making a total of 14 European STPs.

For the three case studies presented here, we applied the abovementioned methodology to calculate the SV and obtained the results set out below (see Table 4). Specifically, the case of the Lombardian STPs is presented as a practical implementation of the theoretical methodology developed in the previous section.

Thanks to the application of steps 1–3, it was possible to create a database of analysable enterprises for all cases (i.e. the final sample of enterprises eligible for the application of the calculation to monetise the SV, generated by the economic activity of the individual entity).

As can be seen from Table 4, we have constructed a comprehensive primary dataset (list of companies with their VAT numbers and the number of workers present within the company structures at the STP); in fact, the VAT number information is over 90% in all cases. This gives us an advantage in extrapolating missing data from the ORBIS platform. At the end of the process of applying the selection criteria (see previous methodology section) we have samples of organisations that can be analysed for each STP, exceeding 50% of those that can potentially be investigated.

Table 4. STP database creation – identification of analysable entities.

	ComoNExT			OpenZone			Kilometro Rosso		
	Nr. firms	%	Nr. workers	Nr. firms	%	Nr. workers	Nr. firms	%	Nr. workers
Data source: Orbis platform									
Companies names	76	100%		32	100%		64	100%	
Companies with VAT numbers	70	92%		32	100%		62	97%	
Companies with Nr. workers	67	88%	596	32	100%	819	64	100%	1'821
ORBIS – VAT numbers searched	70	100%		32	100%		62	100%	
ORBIS – VAT numbers found	68	97%		31	97%		46	74%	
Active companies	66	94%		30	94%		44	71%	
Data up-to-date	66	94%		29	91%		43	69%	
Companies with Nr. workers	55	79%	452	27	84%	766	36	58%	1'524
Complete accounting data	52	74%		24	75%		33	53%	
Data without distortion	52	74%	447	23	72%	731	33	53%	1'520

Source: Own elaboration based on data from ORBIS platform.

Table 5 shows the specific results for each STP regarding the monetisation of the SV that they generate and distribute to the main stakeholders (step 4 of the methodology).

If we apply the same methodology (steps 1–4) to the whole community of 14 European STPs, the results (in %) can be seen in Table 6.

In Tables 5 and 6 we present the results of applying the methodology displayed in the previous section. Following steps 1–4 it has been possible to calculate the SV generated by each STP and also to present a distribution of this SV among the main stakeholders of each park.

Conclusions

The main objective of this work is to present a useful methodology for STP practitioners and policy makers, able to measure SV in STPs and its distribution among stakeholders. In the previous sections we have presented such a tool, based on the utilisation of secondary data to measure SV in STPs. This methodology answers the research gap and the research questions identified in the introduction

Table 5. STP's results in terms of SV generation distribution.

Data source: Orbis platform	ComoNExT	OpenZone	Kilometro Rosso
Accounting data year: 2019			
Aggregated social value	€ 115'993'944	€ 323'326'408	€ 770'354'735
Number of companies	52	23	33
Number of workers	447	731	1'520
Social value per company	€ 2'230'653	€ 14'057'670	€ 23'344'083
Social value per worker	€ 259'494	€ 442'307	€ 506'812
Distribution in value			
Customers	€ 62'558'719	€ 173'349'432	€ 405'164'915
Suppliers	€ 17'574'624	€ 46'751'311	€ 100'526'661
Workers	€ 11'088'947	€ 26'149'644	€ 44'060'328
Public administration	€ 24'249'078	€ 65'515'979	€ 136'925'727
Company's retained	€ 4'119'065	€ 7'689'868	€ 31'437'906
Shareholders	€ -4'232'465	€ 2'498'177	€ 41'207'192
Financial entities	€ 635'977	€ 1'371'996	€ 11'032'007
Distribution in percentages			
Customers	54%	54%	53%
Suppliers	15%	14%	13%
Workers	9%	8%	6%
Public administration	21%	20%	18%
Company's retained	4%	2%	4%
Shareholders	-4%	1%	5%
Financial entities	1%	1%	1%

Source: Own elaboration based on data from ORBIS platform and World Bank Group (2020).

Table 6. Distribution of the SV to stakeholders in the community of 14 STPs.

<i>Data source: Orbis platform Accounting data year: 2019</i>	Mean	Minimum	Maximum	Median
Distribution in percentages				
Customers	52%	48%	55%	53%
Suppliers	12%	6%	18%	14%
Workers	9%	3%	18%	9%
Public administration	18%	13%	23%	19%
Company's retained	4%	1%	13%	3%
Shareholders	3%	−4%	27%	3%
Financial entities	2%	0%	6%	1%

Source: Own elaboration based on data from ORBIS platform and World Bank Group (2020).

section (see Figure 1). This methodology is a step forward (and a contribution) in the more ambitious goal of STP literature that searches for an accurate measurement of the contribution of STPs to society. In this aim, this paper is focused on the creation of SV and its distribution among stakeholders. By considering the SV that a given STP generates for all its stakeholders it is possible to estimate in monetary terms the contribution of that park to society. In this regard, this paper is aligned with the recent trend in the measurement of the STPs contribution to society that goes beyond the traditional variables associated with the number of jobs and firms created.

At the same time, this study has a number of implications for practitioners working in STPs. For example, managers of STPs could communicate to their stakeholders (regional governments, investors, local communities, or the organisations that populate STPs) the amount of SV that each STP is generating and how it is distributed. In that way, regional governments (in many cases in Europe, founders of STPs) could compare the investment made with the social value generated year after year and its distribution among stakeholders. In addition, STPs management organisations could compare the SV they create (and its distribution) with their own aim as both social and economic agents and design new policies to adapt both its amount and distribution with that aim. In addition, STPs could use the calculation of SV as a communication tool to enhance the linkages with local communities and increase the sense of purpose and motivation of the different organisations located in the STP.

The limitations of this study are related mainly with the methodology that has been presented. In order to put it in practice, it is necessary that each STP management organisation could provide the VAT number and the number of employees of all organisations located in the park. In our experience, this simple information was partially unknown by many STP management organisations. In addition, many corporations do not differentiate inside the information given in the ORBIS platform between the whole corporation and the part of the corporation located in the STP. An additional problem is related with the fact that the financial information of many not-for-profit organisations (for example, regional universities located in STPs) cannot be found in the ORBIS database. Finally, the quality of the information given by some corporations and gathered by ORBIS is sometimes incomplete or not completely accurate. Due to these reasons, during the implementation of the methodology we have had to leave out of the analysis a number of organisations.

It is possible to suggest certain new pathways of research which could continue the research done in this work. In the first place, it would be possible to contrast the SV generated by a given STP and its distribution among stakeholders with the purpose statement of that STP. This analysis could be useful for managers of STPs and policy makers to align STPs results with their own purpose. Secondly, it would be possible to explore technical solutions which could overcome the limitations highlighted in the previous paragraph, so that it could be possible to increase the number of organisations incorporated to the analysis in each STP. In fact, both pathways are a continuation of the ongoing process of measuring the contribution of STPs to society in an increasingly more accurate and comprehensive way.

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