

An analysis of the economic and social contribution of Brazilian agricultural cooperatives using the Statement of Value Added

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Abstract

Objective: Assess the creation of wealth by Brazilian agricultural cooperatives and its distribution to the economic agents that helped to create it, comparing the process with for-profit companies.

Method: The analyses are based on secondary data from the database of the yearly “Best and Biggest”. The research design is classified as archival. The sample consists of 1,368 observations, distributed between 2010 and 2016, containing cooperatives and for-profit companies listed in the Ranking of the 400 largest in Brazilian agribusiness. To check the hypotheses, the statistical test Mann-Whitney was used.

Results: The cooperatives contribute significantly to the creation of wealth in the Brazilian agricultural sector. Concerning the distribution of the created wealth, in both the cooperatives and the other companies, the collaborators are the main destination group of the value added. Against expectations, the tax load the cooperatives support is statistically similar to that of the other organizations. Finally, the cooperative members receive a percentage of the value added that is statistically higher than the value the company investors receive, consistently with the purpose of the cooperative.

Contributions: The cooperatives contribute to the economy of the agricultural sector by creating and distributing wealth, mainly at times when the other organizations are stagnating.

Key words: Created wealth; accounting; economic-social; agricultural cooperatives.

1. Introduction

Given the growing pressure from society for companies to take responsibility and increase competitiveness, there is a significant demand for business tools that measure and demonstrate the impacts generated by organizations, economically as well as social and environmentally (Server & Capó, 2011).

In this sense, Duguid (2017) points out that impact assessment tools are available. Traditional accounting instruments, such as the Balance Sheet and Income Statement, are used in conjunction with complementary tools such as the Social Balance Sheet to assist in this process. The need to use these complementary instruments is intensified in cooperative societies, which are entities that seek both social and economic emphases. To ensure the achievement of the social and economic objective, the cooperatives promote initiatives of inclusion and sustainable development, aimed at strengthening the cooperative, the community and the cooperative movement. Thus, recognizing, measuring and communicating these initiatives becomes more and more essential, as it helps to guarantee the loyalty of the cooperative, to ensure economic transactions and to demonstrate the contributions that the cooperatives promote.

Often, however, such tools are not standardized, which does not permit comparisons between companies and, consequently, does not allow the stakeholders to perceive the differential each type of organization originates. Webb (2017) emphasizes that there is a need for accounting tools to reflect the particularities of each organizational arrangement, as only then will it be possible to really perceive the impact of those organizations.

Of course, the metrics these instruments use should permit comparisons between different entities. Given the need and importance of measuring the performance of organizations, the Value-Added Statement (VAS), an integral component of the Social Balance Sheet, is an extremely useful tool in showing how the entity generates and distributes the wealth created among the economic agents that contributed to its generation (Ribeiro & Santos, 2004; Santos, 2005). Thus, due to its social and economic purpose, VAS is a statement that permits analyzing the companies' economic performance in a comparative way, besides evidencing the entity's relationship with the society it is inserted in (Evraert & Riahi-Belkaoui, 1998; Santos & Hashimoto, 2003; Cunha, Ribeiro, & Santos, 2005).

That is the context for cooperative societies, considered as singular entities in the market (Ménard, 2011), with economic and social objectives (International Co-operative Alliance (ICA), 2013). It is necessary to further explore and understand of how cooperative societies interact with their internal and external socioeconomic environments, especially as regards the way in which these entities create and distribute value, considering that they are seen as mere market intermediaries instead of end objectives (Bialoskorski Neto, 2012).

Duguid (2017, p. 42) argues that, "In general, there is an understanding within the cooperative movement that, because of the seven underlying principles, there need to be observable and predictable outcomes that differ from the results observed in other organizational forms."

Thus, the guiding question of this research is: **Are the generation and distribution of wealth to economic agents in agricultural cooperatives comparable to those of profit-making entities in the same sector?** Therefore, the research aims to evaluate wealth creation in Brazilian agricultural cooperatives and their distribution to the economic agents who helped to create it, comparing the process to the profit-making companies that work in agribusiness. To this end, this study presents, in addition to this introduction, a theoretical discussion; then, the research method used, the results of the research performed and the final considerations.

2. Theoretical Framework

2.1 Cooperatives and their commitment to the stakeholders

Cooperatives are considered as intermediary economic market organizations, set up to meet the economic and social aspirations of their members (ICA, 2013, Chaddad& Iliopoulos, 2013; BialoskorskiNeto, 2012). These organizations are considered singular in function of the lack of profit purposes, operational structure, objective and influence of the cooperative doctrine, through its values and guiding principles (Schneider, 2012). The principles of cooperativism are: (1) free and voluntary membership; (2) democratic management and control by the partners; (3) economic participation of members; (4) autonomy and independence; (5) education, training and cooperative information; (6) inter-cooperative cooperation and cooperative integration; and (7) concern for the community.

For Hueth and Reynolds (2011), the cooperative has an important economic and social role of transformation in the community where it is inserted. Such an organization creates market opportunities for a group of formerly disadvantaged producers and permits a more equitable distribution of income than other organizations.

According to the International Co-operative Alliance (ICA, 2013), this distribution of equitable income is linked to the third principle of cooperativism and the economic participation of members, which determines the distribution of returns generated based on the economic participation of the cooperative and not on the holding of capital. In this sense, according to Michie (2011), the economic impacts generated by cooperatives can be further amplified due to the range of individuals who own the cooperative and the way in which they benefit from its existence.

In this sense, the first hypothesis of the study is proposed, *H1: Cooperative societies contribute significantly to the creation of wealth in the Brazilian agricultural sector.*

In addition, according to Michie (2011), in a capital company, resources are directed to the group that holds the largest capital and not necessarily to those that interact with the organization, as is the case of cooperatives. Schneider (2012, 263) agrees by arguing that, in the opinion of several experts, the principle of economic participation is “one of the most characteristic precepts and a key element for the future of the cooperative movement. Through this principle, cooperativism contributes to the solution of the problem of fair distribution of wealth and income”.

Based on its role in a fairer distribution of wealth and income, the Federal Constitution of 1988 provides for the appropriate tax treatment for the cooperative act, that is, the act “which does not imply a market transaction, nor a purchase and sale agreement of a product or good” (Article 79, Law No. 5.764/1971). Accordingly, on the result of transactions with cooperative members, called surplus, no income tax and social contribution are charged, in accordance with Law No. 5.764/1971 and Law No. 10.865/2004, Art. 39. In this sense, the second hypothesis of the work is proposed, *H2: The part of the created wealth the cooperatives set aside for taxes, fees and contributions is statistically lower than that allocated by other organizations.*

Another singularity of Brazilian cooperatives is the financing structure. Brazilian cooperatives are mainly dependent on third-party capital (Carvalho&BialoskorskiNeto, 2008), in view of the difficulty to attract complementary capital contributions from their cooperative members, as capital quotas do not guarantee the cooperative member’s right to the net assets of the cooperative. In addition, it is important to highlight the inaccessibility of the capital quotas to third parties, which are external to the society, which reduces their liquidity, as well as the limitation of interest paid on equity, as provided for in Law No. 5.764/1971. Based on this profile of financing structure, the third hypothesis of the work is formulated, *H3: The part of the created wealth set aside to remunerate capital from third parties is statistically higher than that of other organizations.*

In addition, the cooperative establishes a strong bond with the community, in view of the 7th principle of cooperativism, which requires cooperatives to work towards the sustainable development of their communities through policies approved by their members. According to ICA (2013), there is a bond of self-help and self-responsibility between the cooperative and all of its stakeholders, as cooperatives arise from the demand and are rooted in the communities.

Thus, the cooperative needs to work for the economic and social development of its members, but also of all interested parties in the business. For the cooperative to be able to perpetuate itself in the market, however, in addition to generating benefits, they need to be measured and disclosed in order to strengthen its image as a cooperative and a sustainable business model (ICA, 2013). For Duguid (2017), very little has been reported on the positive and negative externalities that cooperative societies generate, which reflects governance problems in such entities and enhances the information asymmetry among all stakeholders in the organization.

In this sense, proposals such as Rixon (2013) and Beaubien and Rixon (2012) try to work with indicators aimed at revealing the impacts the cooperatives generate, being credit cooperatives in the case of the study sample, aiming to demonstrate based on the cooperative principles the differentials generated in comparison to for-profit organizations. Novkovic (2006) also proposes the disclosure of the impacts the cooperatives generate through financial and non-financial metrics, but points out that little information is disseminated to the external public.

According to Duguid (2017), in order to highlight the contributions and externalities that cooperatives provide to the economy and region where they are inserted, new management tools are gaining strength, such as the Co-op Index, proposed by Hough (2015), the Sustainability Scorecard (Brown, Hicks & Leclerc, 2015) and other reports that are more traditional in the literature, but which the cooperatives exploit still timidly, such as the Global Reporting Initiative (GRI), the International Integrated Reporting Framework (IIRC) and the Social Balance Sheet.

Among the last mentioned instruments, the concept of value stands out as the guiding principle of their development. Among other aspects, such reports are intended to demonstrate what adds value to the organization and how the organization distributes it among stakeholders.

2.2 Statement of Value Added (SVA)

Since the 1970s, the concept of value added has become widely used in the literature as an instrument for analyzing company performance and efficiency. Many studies have used information on companies' generation and distribution of wealth as a way of analyzing asset management efficiency, the size of the tax burden, the distribution of the remuneration of invested capital and the impacts generated for society (Bannister & Riahi-Belkaoui, 1991; Santos & Hashimoto, 2003; Ribeiro & Santos, 2004; Chan, Silva & Martins, 2007; Santos, Cunha, De Luca & Ribeiro, 2013; Esnard, Lyne & Old, 2017).

In Brazil, the generation and distribution of wealth, or value added, is evidenced in the Value Added Statement (VAS). Until 2007, some companies voluntarily presented the VAS. Since the approval of Law 11.638/2007, the disclosure of VAS has become mandatory for Brazilian publicly held companies, resulting in the issuing of technical pronouncement CPC 09 (2008) by the Accounting Pronouncements Committee. The standard issued by the Brazilian regulatory agency arose from the need to define standardized criteria for the companies' elaboration and disclosure of the VAS.

It is worth mentioning that, although the VAS is not within the scope of the mandatory statements required by international accounting standards issued by the International Accounting Standards Board (IASB), the value added represents a performance indicator very close to that required by the GRI guidelines - Economic Value Generated and Distributed (EVG & D) -, which shows its relevance at an international level (Machado, Macedo&Machado, 2015). Thus, within the scope of CPC 09 (2008), the fact that the value added statement is also one of the components of the Social Balance Sheet is highlighted.

According to Santos and Hashimoto (2003: 155), the VAS can be understood as “an orderly way of presenting the wealth the company created and distributed to the various economic agents who collaborate towards its generation”. At that point, the VAS differs from the Income Statement (IS), as it only shows the portion of the wealth created that is allocated to the shareholders - represented by the net profit - while the VAS also presents the portion attributable to creditors, employees and government (Santos & Hashimoto, 2003; Santos, 2005). In this way, VAS brings complementary information in relation to profit, showing the allocation of wealth created by the company among its various stakeholders.

The generation of wealth is evidenced in the VAS by the value the company adds, which is calculated by the difference between revenues and inputs purchased from third parties, representing how much value the entity adds to those inputs that are sold or consumed during a certain period (Evrart&Riahi-Belkaoui, 1998; CPC 09, 2008). The elaboration of the VAS is based on the economic concept of value added, which is used to calculate the country's GDP. There are, however, temporal differences between the accounting and economic models in the calculation of value added, resulting from the accrual basis used for accounting purposes. While GDP is directly related to production, the value added is generated only when the product is sold (De Luca, 1996; CPC 09, 2008).

Thus, the VAS mostly results from the restructuring of the information presented by the income statement itself (CPC 09, 2008). In the first part of the financial statement, the main components of the wealth the entity creates need to be presented, while the second part presents the distribution of this wealth and the remuneration for the various economic agents: employees, government, third-party capital and equity.

Currently, there is no specific, regulated model for cooperative societies. CPC 09 only indicates templates for companies in general, banks and insurance companies. In this sense, Londero and BialoskorskiNeto (2016) emphasize that caution is due in the analysis of VAS information. Cooperative societies are singular entities and, for this reason, the traditional VAS disclosure can lead to distortions in the analysis of the values generated and distributed, mainly as a function of the cooperative member's dual performance in the cooperative (Londero&BialoskorskiNeto, 2016).

3. Method

To achieve the research goal, the study presents an approach consistent with the functionalist paradigm. According to Silva and Neto (2010), from this analytic perspective, reality is considered as concrete, objective and usually constructed based on the analysis of quantitative data extracted from the research phenomenon. According to Burrell and Morgan (1979), studies with this orientation seek to analyze the regularity of phenomena during certain periods and to observe causal relationships between their constituent elements.

Following the logic of the functionalist paradigm, the research presents an exploratory-descriptive design, applying the archival method and using secondary data. The study is based on information obtained in the database of the Institute for Accounting, Actuarial and Financial Research Foundation (Fipecafi), used for the edition of the “Best and Biggest” yearbook. The database collects the information on the components elements of the Value Added Statement, following the template of CPC 09 - Model I Companies in General, for the period from 2010 to 2016. The data provided were already updated to the currency on 12/31/2017, permitting comparisons among the periods analyzed, and were converted to US dollar using the exchange rate of 12/31/2017 (R \$ 3.308 per US\$ 1.00). In addition, information was also provided on the number of cooperatives, employees and the company’s sector classification in the Brazilian agroindustrial system.

3.1 The research sample

The sample comprises cooperatives and other for-profit organizations that forwarded the Value Added Statement to Fipecafi and are listed in the Ranking of the 400 largest Brazilian agribusiness entities, from 2010 to 2016.

From the sample provided, entities with negative distribution of value added in the analysis periods, being one cooperative and 23 for-profit companies, were excluded as, in such cases, these entities are not in a process of wealth creation, but of consumption of that wealth. The negative VAS occurs when the value of the purchased inputs is higher than the revenue.

With this adjustment, the sample totals 1,368 observations between 2010 and 2016. Table 1 shows the number of cooperatives and other organizations in the research sample.

Table 1

Research sample divided between cooperatives and other entities.

	2010	2011	2012	2013	2014	2015	2016
Cooperatives	44	54	51	45	53	58	56
OtherEntities	144	145	154	147	146	148	141
Total Sample	188	199	201	190	193	204	193

Source: Fipecafi (2018).

The other entities group joins the organizations listed as for-profit and is constituted by excluding the cooperative societies from the total sample. It should be noted that, as part of the process for participation in the ranking of the 400 largest entities in Brazilian agribusiness, each organization is required to send its financial statements to Fipecafi. Another form of participation is the publication of these statements. Thus, this ranking does not include all the largest agricultural cooperatives in Brazil, but it does include a group of the most representative ones.

Regarding the representativeness of the sample, in 2016, the last year analyzed, the cooperatives reached the mark of US\$ 4.7 billion in distributed value added, while the other organizations totaled US\$ 32.7 billion. During this period, for the sake of economic share, the Brazilian Gross Domestic Product of the agricultural sector was US\$ 431.9 billion (Center for Advanced Studies in Applied Economics [Cepea], 2018). Although the sample contains only the cooperatives that send their statements voluntarily, it covers most of the largest cooperatives in terms of turnover in Brazil, mainly located in the states of Rio Grande do Sul, Santa Catarina, Paraná, São Paulo and Minas Gerais, considered the cradle and most developed states of Brazilian cooperativism (Pinho, 2004).

Table 2 shows the descriptive statistics of the sample, including the average of the main elements considered in the analysis.

Table 2

Mean of the main sample elements in million dollars at 12/31/2017.

Mean	2010	2011	2012	2013	2014	2015	2016
Assets	779,1	740,7	689,9	821,0	699,2	781,3	817,1
NE	363,9	339,5	303,2	340,1	267,7	268,4	281,7
Created Wealth	134,7	135,6	125,3	160,2	142,5	123,4	118,5
Distributed VA	185,8	178,6	163,6	206,6	182,3	210,5	194,1
Sample	188	199	201	190	193	204	193

Legend: NE – Net Equity; VA – Value Added.

Source: Elaborated by the authors (2018).

Descriptive statistics illustrate that, in general, the sample entities are mostly funded by third-party capital. As observed, the share of net equity (NE) in the asset value, equal to 46.7% in 2010, reaches 34.5% in 2016. Thus, it is to be expected that a significant portion of the wealth created needs to be distributed to remunerate capital from third parties. In a detailed analysis of the cooperative societies, the same scenario is found. On average, 63% of these entities' assets are financed by third-party capital while, in other organizations, the average is approximately 58%. In addition, an average 40% increase can be observed in the wealth created by values received in transfers, which includes the distributed value added, suggesting some dependence of the organizations on this type of resource to distribute values between the parties concerned.

3.2 Analysis variables of the value added and research hypotheses

Based on the theoretical framework and the objective of evaluating the creation of wealth by Brazilian agricultural cooperatives and their distribution to the economic agents that helped to create it, comparing the process to that of for-profit companies, the research starts from three hypotheses. The first hypothesis is related to the creation of wealth by Brazilian agricultural cooperatives:

- **H₁**: Cooperatives contribute significantly to the creation of wealth in the Brazilian agricultural sector.

This hypothesis is based on the studies and data presented by Londero and BialoskorskiNeto (2016), ICA (2013), BialoskorskiNeto (2012), Michie (2011), Brazilian Cooperatives Organization (2015) and the Brazilian Agriculture, Livestock and Supply Department (2017), which justify that agricultural cooperatives contribute significantly to the economy of the agricultural sector, and much of the sector's production passes through those entities.

The other hypotheses evaluate the distribution of value added by cooperatives among their economic agents, in comparison to the other entities.

- **H₂**: The part of the created wealth the cooperatives set aside for taxes, fees and contributions is statistically lower than that allocated by other organizations.

This hypothesis is based on the fact that Brazilian cooperatives do not pay income tax and social contribution on profit in the cooperative act. Thus, as it would be normal for such entities to mostly carry out the cooperative act, depending on their purpose and nature, it is expected that, due to this tax benefit granted to cooperatives, the part of the value added transferred to this stakeholder group is lower when compared to the transfer by the other organizations.

- H_3 : The part of the created wealth set aside to remunerate capital from third parties is statistically higher than that of other organizations.

Brazilian cooperatives are dependent on third-party capital (Carvalho&BialoskorskiNeto, 2008) and, for this reason, they are expected to present significant amounts of financial expense. The descriptive statistics executed in this research revealed that the cooperatives' level of indebtedness is superior to that of the other organizations. Thus, it is expected that the distributed portion for third-party capital remuneration will be higher in cooperative societies than in other companies.

In order to test these hypotheses, as well as to explore the wealth distribution process of the sample organizations, the analysis of the research was based on the creation of value added and the distribution of this value among the agents that contributed to its generation. The selected quotients that are linked to the development of the research hypotheses and the proposal presented by Santos (2007) are displayed in Table 3.

Table 3

Analysis quotients of value added.

Class	Index	Formula
Generation	Labor productivity	Net value added / number of employees
Generation	Sales productivity	Net value added / turnover
Generation	Quotient between VA and total assets	Net value added / total assets
Generation	Quotient between VA and NE	Distributed value added / NE
Distribution	Employee share in VA	(DVA to employees / DVA) x 100
Distribution	Government share in VA	(Taxes, fees and contributions / DVA) x 100
Distribution	Third-party share in VA	(Remuneration of capital from third parties / DVA) x 100
Distribution	Own capital share in VA	(Remuneration of own capital / DVA) x 100

Legend: Partic. – Participation; VA – Value Added; DVA – Distributed Value Added; NE – Net Equity.

Source: Adapted from Santos (2007).

As methodological procedures, tests of means were performed in order to verify the existence of significant differences between the total group of sample entities and the sample without the cooperative societies. For the proper selection of the test, the sample was submitted to a normality test known as Kolmogorov-Smirnov, with Lilliefors correction, where the non-normal distribution of the data was evidenced. This indicated that a non-parametric test should be used, which is used in free distribution samples, and the test targeted ordinal variables. The Mann-Whitney test was used for two independent samples. The software used for the analysis of the tests was the Statistical Package for the Social Sciences (SPSS).

4. Results

The research results are broken down according to the structure of the Value Added Statement and, consequently, with the presented hypotheses. Thus, item 4.1 presents the analysis of the generation of value added, while item 4.2 shows the distribution of value added among the stakeholders.

4.1 Analysis of the generation of added value

The first two items in the VAS correspond to the grouping of revenues and inputs purchased from third parties, and the difference between the two groups results in the gross value added, which represents the wealth created by the entity without considering the deferrals that occur due to depreciation, amortization and depletion. Table 4 shows the values of the items, considering the entire sample.

Table 4

Constitution of gross value added in updated amounts as of 12/31/2017. In billion US\$.

Sum	2010	2011	2012	2013	2014	2015	2016
Revenues	109.1	120.8	106.2	128.4	112.6	123.2	116.7
Inputs from third parties	80.1	90.3	77.1	92.8	80.4	92.8	88.8
Gross value added	29.0	30.4	29.0	35.6	32.2	30.4	27.9
% variation GVA		5%	-5%	23%	-10%	-6%	-8%

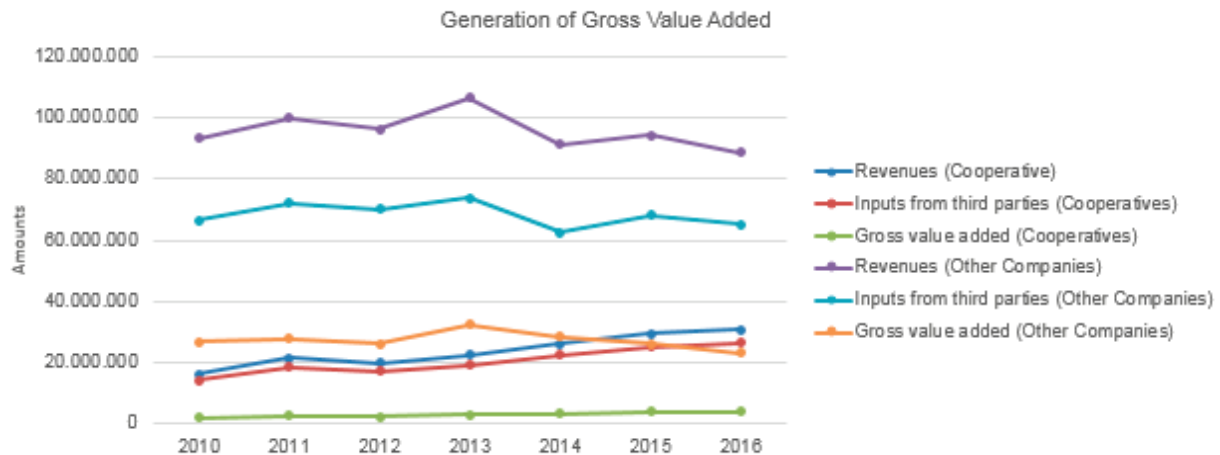
Legend: GVA–Gross value added.

Source: Elaborated by the authors (2018).

The years 2012, 2014, 2015 and 2016 were considered critical for the Brazilian economy, especially for the agricultural sector. Climatic and political-economic events may have led to a decrease in the value added the for-profit entities generated in this period. In the years 2012, 2014 and 2016, lower revenues can explain the reduction in value added. In the year 2015, however, the reduction in GVA is explained by the increase in inputs purchased from third parties, which was not accompanied to the same extent by the increase in revenues.

In a stratified analysis by type of entity, as shown in Graph 1, the cooperatives only showed a reduction in gross value added in 2012. In the other years analyzed, these organizations were responsible for enhancing the growth in the value added, while the other entities showed reductions. For example, in 2014, while the cooperatives' GVA increased by 14%, from US\$ 3 billion to US\$ 3.4 billion, the other showed a reduction by 12%, from US\$ 32.5 billion to US\$ 28.7 billion in the same period. In this sense, the data corroborate the assertion that, in critical periods for the general economic scenario, the cooperatives stand out, presenting an increase in value added, showing resilience in adverse environments (ICA, 2016).

Graph 1 shows the generation of gross value added per period, considering the stratification of the sample in cooperatives and other profit-making organizations.



Graph 1. Constitution of gross value added with stratified sample in updated amounts as of 12/31/2017. In billion US\$.

Source: Elaborated by the authors (2018).

The analysis of the graph reveals that the margin between the cooperatives’ revenues and the inputs they acquired from third parties is lower than that practiced by the other companies analyzed. This aspect may be related to the way cooperatives are able to generate return to their owners, characteristic and in line with the third principle of cooperativism, that of economic participation. In addition to the remuneration for its performance as owner, through the distribution of surplus and interest on own capital, the cooperative can also generate direct returns for the participation of the cooperative member as client or supplier of the cooperative.

In this case, when the cooperative selects these short-term distribution strategies, the cooperative’s revenue can drop, as it offers products and services cheaper to the cooperative members than to the market, or the costs of the purchased inputs increase, as it already makes it possible to pay back the price of the product or input the cooperative member delivered to the cooperative. Thus, even with lower gross value added, cooperative societies that practice such short-term distribution strategies are fulfilling their role, as they are already maximizing the return to their “investor”, the cooperative member. This is one of the reasons why authors such as Londero and BialoskorskiNeto (2016) suggest greater caution in the analysis of the VAS cooperatives disclose.

Using a test of means, we compared the wealth created by all the entities in the sample, composed of profit-making companies and cooperatives in the agricultural sector, and the wealth created by the same group of companies after the exclusion of cooperatives from the sample. The objective was to verify if cooperatives contribute significantly to the generation of wealth in the agricultural sector. Table 5 shows the results found in the analysis of the first research hypothesis.

Table 5
Test of means to check the impact of the cooperatives in the wealth creation of the agricultural sector, considering the entities in the sample. In billion US\$.

Sum	2010	2011	2012	2013	2014	2015	2016
Cooperatives	1.99	2.54	2.30	2.80	3.16	3.65	3.69
OtherCompanies	23.33	24.43	22.88	27.64	24.35	21.52	19.17
Total	25.32	26.98	25.18	30.43	27.51	25.17	22.86
<i>p-value tstatistics</i>	0.114	0.04125**	0.1047	0.1914	0.0839*	0.1284	0.2064

H1: The cooperatives contribute significantly to the creation of wealth in the Brazilian agricultural sector.

Legend: * - Level of Significance at 10%; ** - Level of Significance at 5%.

Source: Elaborated by the authors (2018).

The results show that only in the years 2011 and 2014 there was a significant difference between the two groups of entities. In the remainder of the analyzed period, the exclusion of agricultural cooperatives from the sample did not have a significant impact on the generation of wealth in the sector.

In 2011 and 2014, when the cooperatives contributed significantly to the generation of wealth for the Brazilian agricultural sector, a significant difference in the variation of the wealth created by each group was observed when compared to the previous period. While the cooperatives, in the comparison between 2010 and 2011, grew 25.6% in wealth creation, the other companies registered a more discreet increase by 4.7%. In the analysis of the period from 2013 to 2014, then, the cooperatives recorded a 13.2% growth in wealth created, while the other organizations reduced their potential to create wealth by 11.9%. Thus, the relevance of the cooperatives' contribution to the economy may be associated with the growth rate of the other organizations. When the other companies show periods of stagnation or reduction, the participation of the cooperatives gains strength.

In Table 6, the indicators used in the analysis of wealth generation by companies and cooperatives in the agricultural sector is shown. In this case, the test of means was performed, comparing the indices of the cooperatives and those of the other companies. The objective was to verify if there is a difference in the way the entities generate wealth and to compare some efficiency indicators.

Table 6

Statistical difference between analysis indices of wealth creation in cooperatives and other organizations.

Mean	2010	2011	2012	2013	2014	2015	2016
Labor productivity							
Cooperatives	31.11	34.64	36.04	34.56	32.75	31.76	36.74
Other Companies	66.64	71.25	80.08	66.76	73.59	75.02	68.30
<i>p-value tstatistics</i>	0.0001***	0.0000***	0.0001***	0.0003***	0.0000***	0.0000***	0.0005***
Sales productivity							
Cooperatives	0.1086	0.1066	0.1128	0.1126	0.1027	0.1100	0.1140
Other Companies	0.2759	0.3760	0.3687	0.3710	0.3959	0.4062	0.4195
<i>p-value tstatistics</i>	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
Quotient between VA and total assets							
Cooperatives	0.1527	0.1584	0.1641	0.1667	0.1442	0.1538	0.1614
Other Companies	0.2973	0.3100	0.2974	0.2826	0.2988	0.2727	0.2697
<i>p-value tstatistics</i>	0.0019***	0.0000***	0.0000***	0.0003***	0.0000***	0.0000***	0.0002
Quotient between VA and net equity							
Cooperatives	0.5231	0.5893	0.5852	0.5903	0.6154	0.6233	0.7053
Other Companies	1.0172	1.0970	1.1969	1.2319	0.9904	2.1733	1.8588
<i>p-value tstatistics</i>	0.0117**	0.0010***	0.0007***	0.0152**	0.0004***	0.0007***	0.0092***

Legend: ** - Level of Significance at 5%; *** - Level of Significance at 1%.

The first indicator analyzed compared labor productivity between the two groups of entities. It can be noticed that there was a significant difference between the groups in all the years analyzed, suggesting that the average participation of each employee in the created wealth is smaller in the cooperatives when these are compared to the other companies. In this sense, the average number of employees of the sample cooperatives in the agricultural sector is approximately 1.8 thousand while, in other companies, the average number of employees is around three thousand. Despite the significant increase in the denominator of the indicator in profit-making organizations, the potential net value added is higher, as analyzed in Table 5. Thus, the higher labor productivity is justified, which does not exempt the cooperatives from seeking improvements in their operational structure to increase this productivity.

The second indicator presented in the table shows the sales productivity of the entities. It was observed that, on average, the cooperatives transform a smaller share of the sales in wealth when compared to the other companies in the sample. This difference was statistically significant in all years analyzed. It is also noted that this indicator tends to increase more expressively between 2010 and 2016 in for-profit companies, while it only slightly increases in cooperatives in the same period. This may be due to the fact that cooperatives also distribute wealth to their owners through the sale of their products at subsidized prices, as this strategy reduces the turnover and wealth created by the entity by the same value.

The third indicator reveals the volume of assets invested in obtaining the wealth created by the entities. This index was also significantly higher for profit-making companies, suggesting greater efficiency in the application of these entities' resources in all the years analyzed. In this respect, it is important to highlight the way that cooperatives are moving towards the professionalized management process, seeking to implement and consolidate strategies that provide a more efficient management of these organizations' resources (OCB, 2016).

Finally, the fourth indicator presented shows the volume of equity capital used to obtain the wealth created by the entity. The results show that the cooperatives have a lower relation between the wealth created and the amount of capital applied in obtaining it when compared to the profit-making companies. This suggests that cooperatives create less value through the application of own capital than other entities. Once again, however, it is worth mentioning that the remuneration form of own capital the cooperatives use can partially justify this result.

Thus, at first, the analysis of these indicators reflects the cooperatives' lesser efficiency in the management of their resources and in the creation of value for society when compared to the for-profit companies. One needs to take into account the cooperatives' peculiar form of equity remuneration though. This characteristic may have influenced the calculation of the indicators and mitigated a portion of the wealth generated by these entities.

4.2 Analysis of the distribution of value added

With regard to the distribution of value added, that is, by adding the values received in transfer to the wealth created by the entity, it could be noticed that the profit-making companies receive larger volumes of funds from transfers than the cooperatives. In the cooperatives' case, when comparing the wealth created by the entity with the VAS, as observed in the comparison between Table 5 and Table 7, the average increase in the period analyzed was 24.2%. Meanwhile, in the other entities, the average increase from 2010 to 2014 was 32.3% while, in 2015 and 2016, the increase was 77.8% and 70.8%, respectively.

The Mann-Whitney test results revealed that the cooperative companies contributed significantly to the value added distributed by the entities from the Brazilian agricultural sector in 2010, 2011, 2012 and 2014, considering a 10% significance level, as shown in Table 7. The test was performed by comparing the total number of sample entities (cooperatives and other companies) and other companies.

Table 7

Verification of impact of cooperatives on value added distributed by the Brazilian agricultural entities. In billion US\$.

Sum	2010	2011	2012	2013	2014	2015	2016
Cooperatives	2.46	3.14	2.87	3.32	3.90	4.68	4.71
OtherCompanies	32.46	32.40	30.02	35.94	31.29	38.27	32.75
Total	34.93	35.54	32.89	39.25	35.19	42.94	37.46
<i>p-value tstatistics</i>	0.0916*	0.0367**	0.0969*	0.1351	0.09361*	0.12	0.1751

Legend: * - Level of Significance at 10%; ** - Level of Significance at 5%.

Source: Elaborated by the authors (2018).

When there is a significant increase in the amounts received by other companies, such as in 2015 and 2016, the cooperatives' potential value added is low, losing statistical significance.

Regarding the value-added distribution indices, the sample of cooperatives was compared with the other companies in each analysis period to verify the statistical difference between the distribution form by type of organization. Workers constitute the first group to which the value added was distributed as evidenced in the VAS. Thus, Table 8 shows the share of the value added distributed to employees, encompassing both direct compensation and employee benefits.

Table 8

Comparison of distribution index of value added to collaborators.

Mean	Employee share in value added						
	2010	2011	2012	2013	2014	2015	2016
Cooperatives	36.35%	33.89%	34.54%	34.55%	34.83%	36.00%	33.64%
OtherCompanies	33.65%	32.37%	32.85%	36.71%	35.06%	38.61%	35.14%
<i>p-value tstatistics</i>	0.0636*	0.1024	0.2149	0.3424	0.6144	0.3686	0.1765

Legend: * - Level of Significance at 10%.

Source: Elaborated by the authors (2018).

Based on the analysis of the Mann-Whitney distribution, no differences could be found between the part of the value added the cooperatives and companies distributed to employees, except in 2010, at a 10% significance level, in that the cooperatives distributed a significantly larger share of their wealth created when compared to other entities. In the cooperatives' case, this group received the largest share of the wealth created in each year, totaling US \$ 8.42 billion in the period analyzed.

For the profit-making companies, then, this was also the group that received the largest share of the wealth created up to 2014; after this period, the amounts transferred to third parties surpassed the portion distributed to the employees. From 2010 to 2016, in amounts as of 12/31/2017, these business entities distributed US\$ 58.1 billion to their employees. It is clear that, in absolute terms, the expressiveness of business entities is superior to that of the cooperatives. When relativizing the distribution potential of each entity, however, the portion distributed to their employees is not significantly different when analyzing the two groups of entities.

Regarding the second distribution group of value added, the government, due to the absence of taxation on the surplus - the economic result of the cooperative act -, the research investigated whether the portion of the wealth created the cooperatives set aside for taxes, fees and contributions is statistically lower than that of other organizations. Table 9 shows the share of the value added set aside for the payment of taxes, fees and contributions, considering the municipal, state and federal spheres.

Table 9

Comparison of distribution index of value added to the government.

Mean	Government share in value added						
	2010	2011	2012	2013	2014	2015	2016
Cooperatives	21.38%	23.14%	20.69%	20.12%	19.19%	19.18%	19.17%
Other Companies	26.95%	24.62%	23.00%	24.21%	22.67%	16.26%	22.40%
<i>p-value tstatistics</i>	<i>0.0115**</i>	<i>0.1625</i>	<i>0.2771</i>	<i>0.3132</i>	<i>0.0835</i>	<i>0.6749</i>	<i>0.4769</i>

Legend: * - Level of Significance at 10%; ** - Level of Significance at 5%; *** - Level of Significance at 1%.

H₂: The part of the created wealth the cooperatives set aside for taxes, fees and contributions is statistically lower to that of the other organizations.

Source: Elaborated by the authors (2018).

Against expectations, no statistically significant difference was found between the share of wealth created the cooperatives and companies set asides for taxes, fees and contributions in most years analyzed. This result shows that, despite the tax exemption granted to cooperatives, the share of value added the government consumed in these organizations is as significant as in other organizations. These findings can be justified by the high tax burden on revenue, without significant distinction between cooperatives and profit-making organizations, as well as by the payment of the tax on profit in the case of non-cooperated act, just like in companies.

In absolute terms, measured in the currency of 12/31/2017, during the analyzed period, the transfer of the cooperatives considered in the sample, for tax purposes, was US\$ 4.6 billion, against US\$ 58.7 billion in the other organizations.

The third distribution group of value added shows the portion of wealth created for the remuneration of third-party capital. Due to the cooperatives' dependence on third-party capital, which proved to be superior to that found in companies based on descriptive statistics, the research investigated whether the share of wealth created to remunerate third-party capital is statistically superior to that of other organizations. Table 10 shows the share of value added set aside for the remuneration of third-party capital, considering interest and rents.

Table 10

Comparison of distribution index of value added to remunerate capital from third parties.

Mean	Third parties' share in value added						
	2010	2011	2012	2013	2014	2015	2016
Cooperatives	22.34%	21.54%	22.72%	21.42%	21.83%	25.07%	27.70%
Other Companies	27.48%	33.19%	32.81%	31.86%	33.43%	45.34%	37.09%
<i>p-value tstatistics</i>	<i>0.6784</i>	<i>0.2676</i>	<i>0.2579</i>	<i>0.10167</i>	<i>0.0549*</i>	<i>0.0002***</i>	<i>0.0619*</i>

Legend: * - Level of Significance at 10%; *** - Level of Significance at 1%.

H₃: The part of the created wealth the cooperatives set aside for the remuneration of capital from third parties is statistically lower to that of the other organizations.

Source: Elaborated by the authors (2018).

In the analysis of the Mann-Whitney distribution, H3 could not be accepted, that is, there was no difference between the groups regarding the portion of the wealth created set aside to remunerate third-party capital. In the years 2014, 2015 and 2016, differences were found but, against expectations, the share of wealth created to remunerate third-party capital in cooperatives was statistically lower than that of other organizations.

In 2015 and 2016, the third-party group was the distribution group of value added that received the largest share of remuneration, demonstrating its importance for profit-making companies. During the analysis period, these entities transferred US\$ 95.4 billion to this group, in amounts as of 12/31/2017, the highest volume transferred, with an average 72.6% of this amount corresponding to interests. In the cooperatives' case, in the same period, the distribution of value added reached US\$ 5.5 billion, in amounts as of 12/31/2017. In the analysis of the creation of this value for the cooperatives, 89.9% correspond to interest, that is, a larger share than for the other organizations, which is consistent with the scenario of dependence on third-party capital revealed in the descriptive analysis.

Finally, the last group evidenced by the VAS shows the share of equity in the value added and includes both the part directly distributed to the investor and the portion retained in the entity to pursue its activities. Table 11 presents the results obtained by comparing the analysis indices for the remuneration of own capital.

Table 11

Comparison of distribution index of value added to remunerate own capital

Mean	Share of own capital in value added						
	2010	2011	2012	2013	2014	2015	2016
Cooperatives	19.92%	21.43%	22.05%	23.91%	24.16%	19.75%	19.49%
OtherCompanies	11.92%	9.82%	11.33%	7.21%	8.84%	-0.21%	5.37%
<i>p-value tstatistics</i>	<i>0.0131**</i>	<i>0.0024**</i>	<i>0.0005***</i>	<i>0.0000***</i>	<i>0.0000***</i>	<i>0.0000***</i>	<i>0.0206**</i>

Legend: ** - Level of Significance at 5%; *** - Level of Significance at 1%.

Source: Elaborated by the authors (2018).

In all the years analyzed, a statistical difference could be verified between the groups regarding the share of equity in the value added. The share of wealth created for the remuneration of equity is potentially higher in the cooperatives and, in 2013 and 2014, this group received the largest share of the wealth these entities created. In the companies' case, this group was always the fourth in terms of the share of value added. From 2010 to 2016, in amounts as of 12/31/2017, the transfer of cooperatives from the sample was US\$ 5.9 billion while, in the other organizations, the total transfer was US\$ 20.9 billion. In 2015, 43 for-profit companies presented losses, which resulted in negative average indicators in the period.

5. Final considerations

Conquering the market and increasing the profitability of the business are frequent concerns in organizations. In a complementary way, the other stakeholders in the business also seek to understand how organizations create wealth for their investors and the community where they are located and how they distribute that value (Server & Capó, 2011).

To permit this communication about the externalities, in the economic, social and environmental spheres, it is essential to improve the accounting instruments. The purely economic view of the owner is no longer sufficient to meet the stakeholders' need for information. This nuisance is intensified when we observe the cooperatives, whose objective contains aligned economic and social commitments, and whose principles contain concern with the community.

Currently, the traditional analysis based on indicators and financial statements focused on economic interest with emphasis on shareholders does not meet the need for disclosure of the entities' economic and social impact in society, especially of the cooperatives. In this sense, the VAS is an excellent tool for the organizations to analyze the means of wealth generation and distribution, making it possible to obtain comparable information about the entities' performance, which is of interest not only to the owners of the business, but to everyone who contributed to the process of creating this wealth.

In this scenario, through the use of VAS as an analysis instrument, it could be verified how cooperatives, given their peculiarities, contribute to the economy in the sector they operate in, through the creation and distribution of wealth among economic agents, compared to other companies in the Brazilian agricultural sector.

The results showed that cooperative societies contribute to the economy of the agricultural sector by creating and distributing wealth, especially at times when other organizations are stagnating or reducing their activities. Considering the net wealth created by the entity, however, in most periods, sample cooperatives did not show statistical significance in their contribution to the agricultural sector, as the net wealth the cooperatives generated, when added and removed from the analysis, did not show any difference statistic.

Regarding the distribution of wealth created, the portion that is distributed to employees, government and compensation of third-party capital could not be considered significantly different from the distribution by other companies in most of the periods analyzed. This result is interesting, especially with regard to the portion distributed to the government in the form of taxes, fees and contributions. After all, the cooperatives do not pay taxes on the surplus of the cooperative act. Therefore, it was expected that the share set aside for the government would be significantly lower when cooperatives and other companies were compared, which was not the case. In addition, the share of wealth for the remuneration of capital in the cooperatives is statistically superior to that in the other companies, which is consistent with the cooperatives' acting as market intermediaries and not as end-activities of the process.

As a limitation of the study, it is important to emphasize that the analysis of the production indices of value added can be impaired as a result of the cooperatives' possibility give return to the cooperative members for their role as users of the cooperative. In this case, the short-term transfers, made by offering a higher price for the inputs purchased from the member or a lower price on the product offered by the cooperative, may have impacted the wealth created by the entity. In this sense, it is important to highlight the importance of improving the accounting instruments that can capture such singularities and better permit comparisons between different types of organizations.

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