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The agricultural corporations: a typology and evidences from Brazil

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1. Introduction

This study deals with the organizational forms of agricultural corporations, defined here as profit oriented companies that operate in agricultural production with high scale, various types of property structures and institutional arrangements for the coordination of production transactions. The emergence of agricultural corporations is part of the ongoing transformations in agriculture, traditionally conducted in establishments with individual farmer registration. This process may be associated with land valuation, growth in commodity exports, and direct foreign investment in agriculture in the last decade (FAO, 2013). It is observed the expansion of these organizations in Brazil in cultivated area, mainly in regions of agricultural frontier. For instance, in 2013 there was ten groups operating grain production in a continuous area of nearby one million of hectares in new agricultural lands. (Freitas Jr, 2013a, 2013b).

Some research efforts have been made to explain the characteristics of the agricultural production units. In this field, we can highlight three approaches. First, to consider the principal-agent relationship to justify the predominance of family farms (Allen and Lueck, 1998). Second, associate the attributes of the assets involved in the production as determinants of financial structure (Mondelli and Klein, 2014). Third, the choice of organizational form and structures of governance of global farmers in response to property rights enforcement and measurement costs of the transactions (Karantininis and Zylbersztajn, 2007). This article contributes to the field specifically in the comprehension to the choice of organizational form by large-scale agricultural firms in terms of ownership of capital structure, productive profile, and coordination of transactions, based on evidences in the research context of Brazil.

The characterization and dissemination of these companies in Brazil have not yet been addressed in the economics literature of agribusiness organizations. The phenomenon is present in the Central and Eastern regions of Europe, where it is verified that the so-called corporate farms tend to specialize in high capital intensity products and low labor monitoring requirements, while Family farms specialize in products with a higher labor-monitoring requirement (Ciaian *et al*, 2009). The lack of information about agricultural corporations in Brazil makes it difficult to formulate strategies for actors operating in agribusiness systems (banks, service providers, unions, cooperatives). For the government, the scarcity of information does not facilitate the formulation of public policies that may be necessary to deal with the activity.

The general objective of this article is to propose a typology to analyze the agricultural corporations based on capital ownership structure, productive profile and coordination of transactions. The two specific objectives are, first, to present the subcategories of the typology according to institutional environment and observed practices in the sector, and second, to test the typology with secondary data on a sample of agricultural corporations.

For the capital ownership structure category, we construct three levels of analysis: (1) the origin of control (national, foreign), (2) the type of control (family, partnership, fund), and (3) the legal registry (limited company, corporation privately held, corporation publicly held). For the productive profile, we consider two levels: (1) scale of production and (2) land formation (yes, no). For the coordination of transactions, we consider two levels of analysis: (1) property rights on land and (2) property rights on machinery. This last subcategory, of property rights on machinery, couldn´t be tested by the absence of secondary data on it.

The article is organized in six sections, with this introduction. The next presents the theory involved in the construction of the typology, which is in the third section. The fourth section has the methods used to construct the sample of agricultural corporations and for the data analysis. The fifth section deals with the results and discussion, and the section six has the concluding remarks.

2. Theory

In this section we discuss some theoretical aspects and empirical evidences related to the main issues of interest for the construction of the typology, first, the ownership of capital structure, second, the productive profile, and third, the coordination of transactions.

2.1 Capital Ownership Structure

In order to explain the predominance of the family farm, Allen and Lueck (1998) argue that there is a trade-off between moral hazard, which occurs because of the biological nature of agricultural production, and the gains from specialization. They consider production information is asymmetric, and to avoid the results of moral hazard the most efficient form of agricultural production is the family farm, where specialization occurs within the productive unit. For these authors, nature imposes seasonal restrictions and random shocks, and the interaction of these attributes generates moral hazard, limits gains from specialization, and causes timing problems between stages of production. The production process involves several stages that are linked to biological processes(e.g., planting, flowering, and harvesting) and are required to be performed in certain moments of the year and under certain conditions (e.g., temperature and rainfall). A high degree of moral hazard is a problem because monitoring and evaluation is typically difficult and limited.

These authors argue that the agricultural production activities that succeed in controlling the effects of nature (i.e., reducing the effects of seasonality and random production shocks) have greater potential gains from specialization and lower monitoring costs of wage labor. As a result, firms in these activities will require higher levels of capital and, hence, will be more likely to use equity capital to fulfill their financial needs. The inverse also applies, the gains from specialization will be limited, and wage labor is expensive to monitor for farming activities that cannot control the effects of natural forces, with short or infrequent production stages, and that require few distinct tasks. Those activities, as confirmed by Allen and Lueck, will be better organized by family farms (as opposed to partnerships and corporations), which require lower capital investments. They applied their argument on farming systems in North America. Karantininis and Zylbersztajn (2007) questioned these results based on the existence of many farms with intensive livestock production with a corporate structure in this region, where it is not disallowed by local legislation of the state.

There are several financing options for a firm in the agricultural production sector, as pointed by Mondelli and Klein (2014). Farming enterprises must first choose between renting and buying land and, if buying, then between debt finance; if using equity, between internal equity (up-front investments from member–patrons) and external equity (contributions from external investors); and if using external equity, publicly traded and privately issued securities.

Agency theory has motivated a large volume of empirical studies in corporate finance. The main finding of the literature on agency problems is that the best way to deal with them is to put the agent on an optimal incentive scheme (Hart, 2001). Agency problems are reduced through an appropriate scheme that aligns the manager's incentives with investors' interests. Within agency theory, capital is assumed undifferentiated, and there is no suggestion that debt is better suited for some projects and equity for others (Williamson, 1988 p. 579).

Williamson (1988) argues that additional elements need to be taken into account to understand when it is optimal for a firm to use external equity finance. He develops an asset specificity approach to finance and argues that whether a project should be financed by debt or equity depends principally on the characteristics of the assets. Assets that are highly specific to the project will have lower value for other uses in case the project is liquidated (and has a lower salvage value). When the assets involved in a project/enterprise are highly specific and, hence,

have lower value for other purposes, bondholders are subject to opportunistic behavior by the owner– manager of the firm, as bondholder have no control over firm management.
Following this approach, Mondelli and Klein (2014) tested the general proposition that the higher the level of asset specificity, the higher the probability a firm uses external equity finance. This proposition was deployed in hypotheses for the types of asset specificity (physical, temporal, site, and human) and applied in a dataset of 96 firms of agricultural production, in order to evaluate the effects in the decision of debt or equity adoption. The results suggest that asset specificity should be included in a model that attempts to explain organizational choices in agriculture and that physical asset specificity plays a relevant role in agriculture.
Considering that most of the properties have family governance and registration linked to a rural producer, who is a natural person, one can expect the occurrence of management difficulties of these enterprises. The producer's difficulties stem from the need to manage not only the activities intrinsic to production, such as the purchase of inputs, soil preparation, planting and harvesting, but also support activities such as human resources management, finance and sales. In addition to the complexity of management to accompany technological innovations and competitive pressures from suppliers and buyers, one of the main risks to financial management on farms is the lack of barriers between producer and rural business assets and cash flows.
Agricultural corporation emerges as a new type of rural development that could improve the management of the activity. The legal nature of for-profit company limited type or corporation may result in a different operating mode of traditional farms. The agricultural corporation seems to be able to improve the management of agricultural production and the relationship with suppliers, buyers and financial institutions, generating a positive influence on efficiency in Brazilian agribusiness. The operation as a company facilitates access to long-term financing lines of development banks, individual investor resources, companies, private equity funds or private pension funds, national or foreign.
In order to evaluate the reasons for the preference of the producers for their operation as individuals in relation to company registration, Roveri (2007) interviewed farmers and service providers, as well as simulating the tax burden of each option. The results indicated that the legal nature is indifferent to input suppliers, who consider the history of relationship with the producer. For financial institutions it seems to be safer to lend to companies because of the greater ease of recovering collateral in the event of default. The producers reported the custom of acting as an individual and the lack of knowledge about possible advantages of the legal entity. The simulations indicated a lower tax incidence for companies in relation to the individual.

2.2 Productive Profile

The first aspect to be analyzed in the issue of productive profile is the scale of production. The justification for this option is the association of the agricultural corporations with high-scale agricultural production. Brazilian agriculture has experienced strong growth for more than two decades, though not without crises in certain years, because of crop failures. Agricultural production more than doubled in volume compared to 1990 and meat production almost tripled (OECD / FAO, 2015).The reforms to trade liberalization and deregulation adopted since the 1990s have led to the progressive reallocation of resources to agricultural activities in which the country has a comparative advantage, in order to exploit the potential of international markets. The structure of agricultural holdings has undergone considerable changes with the departure of less efficient producers and the development of large agricultural enterprises that have exploited economies of scale and technical progress, especially in the Midwest.

According to the most recent Census of Agriculture, 2006, units of less than 20 hectares accounted for two-thirds of the total number of rural establishments in Brazil, but occupied less than 5% of agricultural land. On the other hand, the properties of more than 1,000 hectares represented only 1% of the total number of farms and occupied 44% of the land (OECD / FAO, 2015). Of the 4.4 million rural establishments validated in this census survey, only 500,000 accounted for almost 90% of the gross value of production. Of these, only 24,000 produced half the value (Navarro and Alves, 2016). These data suggest that, despite the problematic situation of social inequality in agriculture, a study of the characteristics of agricultural corporations, which integrates this small group of high-scale farms, may be of interest to academics and managers because of the representativeness of food supply to the country and the world.

Another aspect of the productive profile is the strategy of land formation adopted by some agricultural corporations. An evidence of this option was showed by Chaddad (2014), when describing the case of BrasilAgro, an agricultural corporation operating in Brazil with a core business of acquisition, development, operation, and sale of rural properties suitable for agricultural production. He reports the business model of the company minimizes agency costs and allows the expansion with low cost equity capital from outside investors. According to the CEO, it was possible to create a high-performance agricultural production company by means of a well-designed organizational architecture. During the conception of the company, the goal was to minimize agency costs and align incentives between shareholders, corporate managers, farm managers, and employees. In doing so, the firm would be able to expand and benefit from economies of scale and scope, labor specialization, and professional management.

2.3 Coordination of Transactions

In addition to the diversified capital ownership structure, agricultural corporations adopt complex arrangements to coordinate their activities. Land leases, subcontracting of planting, production and harvesting services are observed, as well as innovative arrangements that may include contracts with smaller producers, in addition to own production. In this case, it may be hypothesized that agricultural corporations may adopt decision-making processes distinct from traditional farms regarding the degree of vertical integration in land access and mechanization services), in view of not only the criteria for minimizing transaction costs (Williamson, 1991), but also the impacts of asset management on the organization's results.

For the level of governance analysis, the Transaction Cost Economics deals with the contractual aspect of organizations and the coordination of transactions with third parties, when considering the assumptions of limited rationality and opportunism of agents. Based on Coase (1937), the theory recognizes the existence of transaction costs to negotiate and monitor contracts considered incomplete to coordinate transactions. The basic theory hypothesis is that agents make a rational choice between governance structures (hierarchy, long-term contracts, and market). The structure adopted would be the most appropriate to the attributes of the transaction involved (frequency, uncertainty and asset specificity), seeking to minimize transaction costs (Williamson, 1991).

In the development of theory, the literature has accumulated a huge amount of empirical studies at the governance level, focusing on testing the hypotheses of alignment between transaction attributes and governance structures. One of the hypotheses most tested in the literature is that investment in specific assets in the transaction favors the adoption of governance structures that offer greater coordination, such as hierarchy or hybrid structures (contracts). For such studies, institutions are considered exogenous to the process of choosing the governance structure, since they are common to the partners and do not change in the time horizon of the data collection. In the vast majority of cases, evidence was found to support the hypotheses of the theory, as can be seen in the reviews of Macher and Richman (2008) and Ruester (2010).

Karantininis and Zylbersztajn (1997) analyzed the global farmer phenomenon, where entrepreneurs establish an activity in two distinct economic and institutional environments. In order to explain how global farmers choose institutional arrangements in terms of contracts and agreements, they adopt the transaction cost perspective and in particular the property rights theory of the firm as developed by Barzel (1997). In this framework, any transaction is a transference of a set of property rights, compounded by a number of specific dimensions that differ in terms of measurement costs of attributes being transacted as well as costs of the joint production effort. Institutional arrangements are designed to protect both economic and legal rights associated with production. Transaction dimensions that are easier to measure are coordinated by contracts and enforced by courts. Particular dimensions that are difficult to measure are considered too costly to be enforced by the state and are technically not contractible, being enforced by other means.

Based on this theory, these authors propose that complex transactions in agriculture (hybrid forms) are made partially by means of contracts and agreements. Depending on the relative ability of the institutional arrangements to protect economic and legal rights, it might be preferable to draft an agreement or contract. The authors consider that when farmers choose a particular crop to produce, they simultaneously choose the degree of complexity of the transactions to be carried out. Therefore, their social connectedness and local institutional characteristics limit the choices of activities to be developed. If the production technology demands many difficult-to-measure dimensions, then it is more difficult to contract.

The land access becomes particularly relevant for the agricultural corporation, due its impacts of capital structure, governance costs and revenue flows. While some companies prefer to expand the production by renting new areas of third parties, others search for profits from two sources: the agricultural activity and the gains of capital due to the land development. One agricultural corporation that excels in contract management is the Argentine group Los Grobo, which in 2009/10 has become the second largest grain producer in Latin America, growing 250,000 hectares to generate 2.6 million tons of grains and earn a revenue of USD 550 million. What is remarkable in this performance is that it is obtained without the ownership of the exploited lands and supported in a network of suppliers for the supply of inputs and services of risk management. According to statements by the chief executive, the model may indicate the future of global agricultural production by relying on knowledge rather than asset immobilization. In addition to operations in Paraguay and Uruguay, the group managed to explore 55,000 hectares in Brazil (Scott and Bell, 2011).

An analysis of the company Agrinvest reveals some differences between agricultural corporations and traditional farms. Founded in 2005 with funds from the American fund Ridgerfield Capital, Agrinvest has invested about USD 100 million since the beginning of its activities. In this harvest season 2012-2013 the company cultivated 77 thousand hectares and still has 22 thousand hectares available for expansion between Maranhão and Piauí. Despite the large area planted, Agrinvest keeps little capital immobilized on land. Of the almost 100,000 hectares it manages, only 12,600 are owned by it. The remainder is exploited by means of leases with an average duration of 12 years. The company also limits its investments in machinery. Although it owns 95% of the equipment used in planting, all the spraying and harvesting activity is conducted by third parties. In 2012, Ridgerfield Capital sold its stake to a group of Brazilian investors (Freitas, 2013c).

The decision to make or contract mechanization services was analyzed by Mascarin (2014) in the context of sugarcane and soy production in Brazil. As a result of analysis of the institutional environment, it was shown that there are ambiguous rules regarding subcontracting, which sometimes discourages and penalizes those who choose to hire. A sectorial analysis of the mechanical harvesting services market in the productive chains of soy and cane sugar was made through two case studies. In-depth interviews were conducted with providers and stakeholders

of mechanized harvesting services. As a prominent result of the analysis it appears that the services arise from farmers (100%) who had decided to optimize their machines, and also that the majority (63%) operates informally.

3. The Typology

In this section we present the results of the conceptual elaboration for the typology of agricultural corporations

3.1 General Aspects

The construction of a typology must consider the choice of criteria that could be useful for the identification of homogeneous groups. If the typology has more than one category, it could be possible to combine them and make a richer analysis of the cases or to elaborate on the relationships between them. In the following paragraphs, we present an analysis of the possible criteria to be used in the typology of agricultural corporations.

Scale of Production. This is one of the basic aspect to classify the organizations in agricultural production. In Brazil, the most recent official data on the scale of agricultural properties is of 2006, from IBGE, the Brazilian Institute of Geography and Statistics. According this source, the properties of more than 1,000 hectares represented only 1% of the total number of farms and occupied 44% of the land (OECD / FAO, 2015). This lack of information poses a challenge to use this category for agricultural corporation, since they are in this range and the data must be collected directly. Besides that, it will be necessary to create new ranges of area above 1,000 hectares. This criterion could be applied in the level of farm or the economic group. In this case, it is possible investigate the trade-off between the economies of scale and the cost of governance.

Land Formation. This aspect is one of the distinctive characteristics of some agricultural corporation, according previous studies. It is the option of the company to adopt the land formation, based on buying degraded or frontier lands, to invest with infrastructure and soil correction during agricultural production, and to sell the land with profit. This strategy is present in the case of Brasilagro (Chaddad, 2014), which explicitly count on this source of revenue in its business model. This category could be measured with secondary data, by searching in the website or official reports for mentions or declarations on the presence of this activity and the results obtained.

Type of labor force. A classification of farms in four types is proposed by Kageyama et al, (2013), according to the composition of the labour force employed: exclusively family farm; land reform settlement (“assentado”); family farm with hired labour; non-family farm. Exclusively family farms are run by the owner and employ exclusively family labour; land reform settlements are also mostly family-run units; mixed family farms are run by the owner and employ predominantly family labour, complemented by hired labour; non-family farms depend mostly on hired labour, with or without the help of the owner’s family. Aspects such as area, gross production value, productivity and revenues are analyzed. One of the main results is that the family units are largely predominant in number (90% of the total) and employ 80% of the labour force in the agricultural sector, although they contribute with only 50% of the gross production, in virtue of lower productivity.

The non-familiar farms are 15.6% of the units and 75.7% of the total cultivated area, and all the agricultural corporations must be in this category. We should be aware that the attribute of familiar for these authors is associated to the use of family labor force in the agricultural production activities, and not to the concept of Family business used in corporate governance field. In order to apply this criterion for agricultural corporations, the modes could be (1) temporary workers and (2) permanent workers.

Origin of controlling interest. This issue could be ranked by two categories: (1) national; (2) foreign. This aspect is becoming more complex to be evaluated, considering the growth of global financial flows, since some foreign investor can register a local firm, or, by the other hand, a local citizen can create a trust overseas to control a agricultural corporation in the home country. Even with these restrictions, the main aspect to be evaluated is the institutional environment related to foreign investments or land acquisition or renting.

Type of control. This aspect could be evaluated by three categories: (1) Family, with the founder and relatives controlling the capital of the company; (2) Partnership or group, with the company owned by any kind of society, partnership or economic group; and (3) Fund, with the control by any kind of fund, such as hedge fund, pension fund or sovereign fund. These levels indicate different requirements of compliance to corporate governance and return over the capital or sales.

Legal registry. This criterion is the type of organization according commercial rules in the country, or in regional legislations. It was applied to the concept of global farmer by Karantininis and Zylbersztajn (1997), with the following categories: (1) Migrant Farmer, when the farm is operated in the new country by an individual with a similar status the previous location; (2) Partnership, with the operation with any kind of association with in the new country with someone from his home country or with a local farmer; (3) Corporation, with a formal partnership and funding from the home country, often associated to more vertical integration; and (4) Multinational, with an existing multinational corporation that extends its activities in a new country or region.

In Brazil, the legal registry could be: (1) Farmer (individual), with some simplified rules for registry of transactions and tax collection; (2) Limited company, with private control by a family or partners; (3) Corporation privately held, a society with private control without trading shares in the market; and (4) Corporation publicly held, a society with trading shares in the market. These categories have distinct levels of capital ownership concentration and complexity of management and reports for assets and results.

Property rights on land. This subject is evaluated by the ratio of rented from third parties and owned area for the operation of the agricultural corporation. In this segment there are companies with strategic focus on buying, developing and selling lands, operating like a real state company for urban building construction. Another opposite profile is the corporation with focus on agricultural production, operating with the predominance of rented land. Between these poles, there are a variety of strategies with respect to the property rights on the land.

One restriction for these strategies in Brazil is a law prohibiting the purchase or lease of land by foreigners. Gilio et al (2015) discussed the effects on sugarcane industry of restrictions on land acquisition by foreigners in Brazil, defended by LA-01, of August 19, 2010, written by the Attorney General of the Union (AGU) and approved by the President on the same date. Evidences collected from secondary sources indicate that the instability caused by the legal rules imposed by the approval and publication of this opinion has influenced the decision of foreign investment in the production of sugarcane ethanol industry, which is dependent on long-term decisions of investments and assets of high specificity, in areas agricultural and industrial.

Property rights on machinery. The agricultural corporation can define a ratio of outsorcing and internal mechanized services for the crop operation. The rationale of transaction cost minimization associated to the attributes of the transaction in question, following the Transaction Cost Economics, will respond to the most efficient choice between the owned machinery and outsourcing the services (Williamson, 1991). The risk involved in outsourcing is the opportunistic behavior by the third party who supply the service. For instance, in the harvest period, this supplier could raise the prices, considering the weak position of the agricultural corporation. Other factors to be considered are the quality of the service, which could be monitored with owned machines, and the capital immobilization with this option.

3.2 The Framework

Considering the exploratory character of this article, the proposed typology has three basic categories: capital ownership structure, productive profile, and coordination of transactions. The first one have the levels of origin of controlling interest, type of control and legal registry of the organization. The second involves the aspects of scale of production and land formation. The third comprises the property right on land ad property right on machinery.

4. Methods

We present the methodological procedures in this section. This article have an exploratory and qualitative analysis of the issue of the organizational forms of agricultural corporations in the Brazilian research context. This approach can be justified by the lack of official data and previous research on this population. With respect to agricultural production data, public agents at federal level, such as Agricultural Ministry (MAPA) and Brazilian Institute of Geography and Statistics (IBGE), present some aggregate information for products, regions, states and cities from periodic surveys during each crop season. In this sense, these sources do not identify the type of productive units involved and the respective share, for the categories of legal registry.

As mentioned before, the last official data in the level of productive unit (farm) was for 2006, by the Census of IBGE. Even in this database, the farms associated to agricultural corporations could not be identified, since they should be included in the broad category of "non-familiar farmer". The official data of firms of every sector, collected by Treasury Ministry for tax collection purposes are not available for searching in a disaggregated way, due to the restrictions of commercial legislation on access to firms' registry data.

In order to overcome these restrictions on data availability, we conducted the following steps to construct a sample of agricultural corporations. First, search for data of agricultural corporations in rankings of agribusiness organizations in Brazilian business publications, such as "Melhores e Maiores" (Exame, 2016) and "Valor 1000" (Valor Econômico, 2016). We could search for the companies in the website of these publications in the period from 2011 to 2015. Second, we made contact with managers and leaders of private associations from agribusiness sector to collect the name of agricultural corporations. In this stage, at each contact, we showed to the respondent our list of companies to confirm the accuracy of the data and to ask for more organizations with the same profile. With these two procedures, we could collect a sample with the 19 largest groups in Brazil, according to the perceptions of the respondents.

With this group of companies, we started the collection of secondary data to construct an original database with relevant information to apply the proposed typology. We conducted the following procedures: (1) search for information in the websites of the companies, including the productive profile and data for the categories of the typology; (2) search for academic papers or in business magazines, newspapers and websites.

When the database was complete, the data was analyzed with descriptive statistics and the companies were classified with the typology. In order to present and validate the preliminary results, we organized an open seminar in November 2016 at the University of Sao Paulo with two experienced professionals in the subject of agricultural corporation. They were Fernando Jank, an independent business advisor with experience in the segment and Julio Toledo Piza, former CEO of Brasilagro, one of the main agricultural corporations in Brazil. Their contributions during the event were incorporated in the results of the article.

5. Results and Discussion

In this section we present and discuss the results following the structure of the typology proposed.

Table 1. Capital ownership structure of agricultural corporations

Group	Origin of Control	Type of Control	Legal Registry	City of Central Office
Adecoagro	Argentine	Partnership	Limited Company	São Paulo (SP)
Agrícola Xingu	Japan	Partnership	Corporation Privately Held	São Paulo (SP)
Brasilagro	Argentine	Partnership	Corporation Publicly Held	São Paulo (SP)
Brookfield	Canada	Fund	Limited Company	São Paulo (SP)
El Tejar	USA	Fund	Limited Company	São Paulo(SP)
Sollus Capital	Argentine	Partnership	Limited Company	São Paulo (SP)
Tiba Agro	USA	Fund	Limited Company	São Paulo (SP)
Agrifirma	Brazil	Fund	Limited Company	São Paulo(SP)
Agrinvest	Brazil	Partnership	Corporation Privately Held	Ribeirão Preto (SP)
Amaggi	Brazil	Family	Limited Company	Cuiabá (MT)
Cantagalo	Brazil	Partnership	Corporation Privately Held	São Paulo (SP)
Grupo Bom Futuro	Brazil	Family	Limited Company	Cuiabá (MT)
Grupo Horita	Brazil	Family	Limited Company	Barreiras (BA)
Grupo JD	Brazil	Family	Limited Company	São Paulo (SP)
Grupo Roncador	Brazil	Family	Limited Company	São Paulo (SP)
Grupo Scheffer	Brazil	Family	Limited Company	Sapezal (MT)
Insolo	Brazil	Partnership	Limited Company	São Paulo (SP)
SLC Agrícola	Brazil	Partnership	Corporation Publicly Held	São Paulo (SP)
Terra Santa	Brazil	Fund	Corporation Publicly Held	São Paulo (SP)

Source: elaboration with public data from the companies

The results for the category of Capital Ownership Structure, with the subcategories of Origin of Control, Type of Control and Legal Registry are in Table 1. The sample of agricultural corporations is composed by 19 groups, being 12 of national control and 7 of foreign control, being 3 from Argentine, 2 from USA, 1 from Japan and one from Canada. The presence of international capital in this segment is significant, even with the legal restrictions for land acquisition. It seems that these barrier have been overcome with partnerships with local agents. Their central offices are located mainly in Southwest Region, with 14 in the state of São Paulo, with seven foreign groups and five local groups in the city of São Paulo and one in Ribeirão Preto, and in Midwest Region, with three in the state of Mato Grosso (MT). The concentration of the headquarters in the largest city in Brazil reveals the first distinctive characteristic of agricultural corporation, which is the ability to operate farms with long distances, since they can be located in the Midwest, Northeast and North regions. This option reveal a decentralization in the organizational structure that is not trivial for traditional farmers, operating as individuals. Since all the foreign groups in the sample located their central offices in São Paulo (SP), this characteristic seems to be even more evident when compared to national groups.

With respect to the subcategory of Type of Control, the predominant mode is Partnership, with 8 cases, followed by Family, with 6 cases, and Fund, with 5 cases. As expected, the foreign groups present only Partnership (4 cases) and Fund (3 cases), resulting from investment strategies of international groups. For the subcategory of Legal Registry, we see the predominance of Limited Company, with 13 cases, followed by Corporation Privately Held and Corporation Publicly Held, both with 3 cases. This lower participation of corporations in this sample may reflect the institutional environment and transaction costs related to the operation with stocks in Brazil. Questions about volatility e even the size of the stock markets seems to refrain the movement of these groups in this direction. By the other hand, the status of organic growth of family controlled groups with national control seems to be more adequate for limited firms, due to the strict control they provide, with less pressure from the markets on issues of compliance and transparency.

Table 2. Productive profile of agricultural corporations

Group	Year of Foundation	Number of Farms	Managed Area (ha)	Average Area per Farm (ha)	Land Formation
Adecoagro	2002	11	33,690	3,062.73	Yes
Agrícola Xingu	2004	4	116,000	29,000.00	Yes
Brasilagro	2006	8	136,015	17,001.88	Yes
Brookfield	1899	8	533,000	66,625.00	Yes
El Tejar	1987	7	84,300	12,042.86	Yes
Sollus Capital	2008	11	28,693	2,608.45	Yes
Tiba Agro	2009	13	320,000	24,615.38	Yes
TOTAL		62	1,251,698		
Agrifirma	2008	3	71,276	23,758.67	Yes
Agrinvest	2005	6	99,000	16,500.00	No
Amaggi	1977	10	223,460	22,346.00	No
Cantagalo	2011	4	146,739	36,684.75	No
Grupo Bom Futuro	1985	29	594,250	20,491.38	No
Grupo Horita	1984	6	150,000	25,000.00	No
Grupo JD	1990	10	2,352	235,20	No
Grupo Roncador	1978	4	40,000	10,000.00	No
Grupo Scheffer	1983	11	108,000	9,818.18	No
Insolo	2008	6	116,631	19,438.50	Yes
SLC Agrícola	1977	14	377,000	26,928.57	No
Terra Santa	2006	9	163,800	18,200.00	No
TOTAL		112	2,092,508		

The results for the category of Productive Profile are in Table 2. In the sample, the Managed Area varies from 2,352 ha (Grupo JD) to 533,000 ha (Brookfield), with an average of 176,010 ha. As an aggregate, the foreign corporations have 1.25 millions of ha in 62 farms, lower than the 2.09 millions of ha in 112 farms of the national corporation. The expansion of scale of production seems to be limited by governance costs in the level of farm and the group.

Table 3. Property rights on land of agricultural corporations

Group	Managed Area (ha)	Owned Area (ha)	Rented Area (ha)	Percentual of Owned Area on Managed Area (%)
Adecoagro	33,690	33,690	0	100.0
Agrícola Xingu	116,000	116,000	0	100.0
Brasilagro	136,015	136,015	0	100.0
Brookfield	533,000	533,000	0	100.0
El Tejar	84,300	51,400	32,900	61.0
Sollus Capital	28,693	28,693	0	100.0
Tiba Agro	320,000	320,000	0	100.0
TOTAL	1,251,698			
Agrifirma	71,276	71,276	0	100.0
Agrinvest	99,000	12,600	86,400	12.7
Amaggi	223,460	223,460	0	100.0
Cantagalo	146,739	146,739	0	100.0
Grupo Bom Futuro	594,250	594,250	0	100.0
Grupo Horita	150,000	150,000	0	100.0
Grupo JD	2,352	2,352	0	100.0
Grupo Roncador	40,000	40,000	0	100.0
Grupo Scheffer	108,000	26,000	47,000	24.0
Insolo	116,631	116,631	0	100.0
SLC Agrícola	377,000	377,000	0	100.0
Terra Santa	163,673	89,301	74,372	54.5
TOTAL	2,092,381			

The data on Land Formation indicate a clear distinction between foreign and national corporations, since all of the companies in the first case adopt this strategy, and only a two national corporation follow this option. This could be explained for the profile of the capital owners abroad when investing in primary sector in Brazil, particularly with respect to the profitability and the construction of exit mechanisms for the investments. By the other hand, national groups have an origin in the agricultural production, and do not value at the same level the operations of buying and selling land, at least with the frequency observed in the groups with this explicit strategy.

The results for the category of Coordination of Transactions are in Table 3. As mentioned earlier, we limited our analysis to the issue of access to land, since we could not collect secondary data on machinery with the methodology adopted. The data on property rights on land indicate a conservative profile of the corporations. For the foreign corporations, only one group presented a percentage lower than 100% for owned area over total managed area, which was the group El Tejar, with 61.0%. These results seems to be consistent with the adoption of the strategy of land formation.

In the sample of national groups, we can see three groups with focus on renting land from third parties: Agrinvest, with 12.7% of owned land, Grupo Sheffer, with 24%, and Terra Santa, with 54.5%. The low adoption of renting land may be associate with some transaction costs in this market, related to the quality of the land titles, or the risk of opportunistic actions. For the adopters of renting, we see an aggressive strategy for the high participation of rented land. This option, seems to be limited only by the minimum amount of owned land required by the bank to deliver loans for agricultural production.

6. Concluding Remarks

This article had the objectives to propose and test a tipology for agricultural corporations operating in Brazil. The variety of organizational forms to operate poses a challenge for the choices in the areas of capital ownership structures, productive profile and coordination of transaction. The results offered an overview of these issues for a sample of 19 agricultural corporations, which can be considered almost a census in the segment of large-scale agricultural production by profit oriented organizations in Brazil. This is a relevant contribution of the article, and to our knowledge there wasn´t an earlier study with this characteristics.

For the Capital Ownership Structure issue, the article could show a prevalence of national capital in controlling the corporations in terms of quantity of groups and managed area. This result indicate the organic growth of family controlled groups in agribusiness, and probably some barriers for the foreign capital due to international turbulences and some aspects of the institutional environment related to the land market and property rights protection. The limited company is the prevalent legal registry, which can indicate the need for a high patrimonial control, similar to the operation as an individual, but with more flexibility to aggregate capital and to distribute profits to the partners. The forms of corporation privately held or publicly held seem to be inadequate at the evolutionary level of the majority of the groups, considering the governance and transaction costs.

Productive Profile is diversified in terms of scale of production, the average level is as high as 170,000 ha. The governance challenges of these structures present risks from the areas of production, market, weather and logistics. When searching for secondary data on these groups, we saw some histories of debt restructuring operations and even the change of the name of the group (Vanguarda Agro becoming Terra Santa). These are evidences that the operation with high scale production is risky, especially in remote areas of the country. The article suggest the

need for new studies relating the impact of the scale of production on the profitability and the governance costs of agricultural corporations. Another remarkable result is the adoption of the strategy of land formation for all the foreign corporations, and almost ignored by the national groups. This suggest an implication on the possible imitation by these groups or for creation of a market for firms specialized in search, develop and sell agricultural land, operating with contracting agricultural operators for the development stage.

About the Property Rights on Land issue, the results indicate the low level of adoption of rented land for production, an efficient option in order to reduce the immobilization of capital in land. Only by producing, the corporation promotes the leveraging of the value of land, and this asset may become too high to be carried in the patrimonial and lowers the return over the investments. Future studies should be conducted to evaluate what are the barriers for expansion of market for rented agricultural land.

The main limitation of the article was the lack of primary data in order to evaluate the determinants of the capital ownership structures, the productive profile and the coordination of the transactions. However, the typology opens a research agenda for the elaboration of propositions and hypothesis for the categories involved, for future quantitative analysis.

References

Allen, D.W. and D. Lueck. 1998. The Nature of the Farm. *Journal of Law and Economics*, 41: 343–86.

Barzel, Y. 1997. *Economic Analysis of Property Rights*. Cambridge: Cambridge University Press.

Chaddad, F. 2014. BrasilAgro: Organizational Architecture for a High-Performance Farming Corporation. *American Journal of Agricultural Economics*, 96: 578-588.

Ciaian, P., J. Pokrivcak, and D. Drabik. 2009. Transaction Costs, Product Specialisation and Farm Structure in Central and Eastern Europe. *Post-Communist Economies*, 21: 191–201.

Coase, R.E. 1937. The Nature of the Firm. *Economica*, 4: 386-405.

Exame. 2016. *Melhores & Maiores 2016*. Available at: http://mm.exame.abril.com.br/.

FAO, 2013. *Emerging Investment Trends in Primary Agriculture: A Review of Equity Funds and other Foreign-Led Investments in the CEE and CIS Region*. Rome. Available at: http://www.fao.org/publications.

Freitas Jr., G. 2013a. Megaprodutores Consolidam 'Última Fronteira'. *Valor Econômico, Agronegócios*, April, 1st. Available at: http://www.valor.com.br/empresas/3067284/megaprodutores-consolidam-ultima-fronteira.

Freitas Jr., G. 2013b. Dez Grupos Têm um Terço da Nova Fronteira da Soja. *Valor Econômico, Agronegócios*, April, 1st. Available at: http://www.valor.com.br/empresas/3067336/dez-grupos-tem-um-terco-da-nova-fronteira-da-soja.

Freitas Jr., G. 2013c. Agrinvest Produz com Mentalidade de Trading. *Valor Econômico, Agronegócios*, April, 15th. Available at: http://www.valor.com.br/empresas/3086176/agrinvest-produz-com-mentalidade-de-trading.

Gilio, L., M.A.F.D. Moraes, G.C. Moreira, and A.F.T.S. Guardia. 2015. Restrição à Propriedade e Arrendamento de Terras por Estrangeiros: Evidências sobre Efeitos nas Decisões de Investimento do Setor Sucroenergético. *Economic Analysis of Law Review*, 6: 356–372.

Hart, O. 2001. Financial Contracting. *Journal of Economic Literature*, 39(4): 1079–1100.

Kageyama, A.A., S.M.P.P. Bergamasco, and J.T.A Oliveira, 2013. Uma Tipologia dos Estabelecimentos Agropecuários do Brasil a Partir do Censo de 2006. *Revista de Economia e Sociologia Rural*, 51: 105–122.

Karantininis, K. and D. Zylbersztajn, 2007. The Global Farmer, Typology, Institutions and Organization. *Journal on Chain and Network Science*, 7: 71-83.

Macher, J.T. and B.D. Richman. 2008. Transaction Cost Economics: An Assessment of Empirical Research in the Social Sciences. *Business and Politics*, 10:1-63.

Mascarin, A.L.C. 2014. *Serviços de Mecanização Agrícola: Atividade Meio ou Atividade Fim?* Unpublished Dissertation (Master of Science). Universidade de São Paulo, 138 pp. Available at DOI: 10.11606/D.12.2014.tde-08012015-150454.

Mondelli, M.P., and P.G. Klein. 2014. Private Equity and Asset Characteristics: The Case of Agricultural Production. *Managerial and Decision Economics*, 35: 145–160.

Navarro, W. and E. Alves. 2016. Pobreza Rural, Pobreza de Idéias. *O Estado de São Paulo, Opinião*, April, 13th. Available at: http://opiniao.estadao.com.br/noticias/ geral,pobreza-rural--pobreza-de-ideias,1855292

OECD/Food and Agriculture Organization of the United Nations. 2015. *OECD-FAO Agricultural Outlook 2015*, OECD Publishing, Paris. Available at http://dx.doi.org/ 10.1787/agr_outlook-2015-en.

Roveri, P. 2007. Escolha da Forma Jurídica da Empresa Agrária: Tendências e Análise. *Anais do SIICUSP - Simpósio Internacional de Iniciação Científica*. São Paulo: Universidade de São Paulo, November. Available at https://uspdigital.usp.br/siicusp/ cdOnlineTrabalhoVisualizarResumo?numeroInscricaoTrabalho=1522&numeroEdicao =15

Ruester, S. 2010. Recent Developments in Transaction Cost Economics. *Resource Markets Working Paper* No. RM-18. Available at SSRN: http://ssrn.com/abstract=1535903.

Scott, C and D.E. Bell. 2010. Los Grobo: Farming's future? *Harvard Business School Cases*, Nov. Available at http://hbr.org/product/a/an/511088-PDF-ENG.

Valor Econômico. 2016. *Valor 1000: 1000 Maiores Empresas*. Available at http://www.valor.com.br/valor1000/2016

Williamson O.E. 1988. Corporate Finance and Corporate Governance. *The Journal of Finance*, 43(3): 567–591.

Williamson, O.E. 1991. Comparative Economic Organization: The Analysis of Discrete Structural Alternatives. *Administrative Science Quarterly*, 36(2): 269-296.