



Dynamics of structural change in agriculture, transaction cost theory and market efficiency: The case of cultivation contracts between agricultural enterprises and the food industry

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ABSTRACT

In developed economies, the increasing openness of markets, the ease of trade and the speed of information lead to territorial imbalance and marginalization phenomena of small agricultural activities that cannot compete with the new models of agri-food systems. In this research, starting from this situation, we analyze through the Transaction Cost Theory what can be practised too recover competitiveness margins for small farms. From the study, it emerges that cultivation contracts represent a valid tool for the solution of various marginalization problems of many agricultural enterprises. In particular, from the experience gained over the past few years in Sicily, the cultivation contract brings benefits to both the food and agricultural enterprise. The validity of the food supply chain vertical integration model is based on this aspect.

1. Introduction

Economic development and growth, also accompanied by globalization and the decrease in the ease of communication and exchange of goods and services, have led to an increase in the breakdown and division of agricultural and agri-food production processes, increasing the need to overcome technical-organizational inefficiencies and distortions in the market for products and production factors [1]. These inefficiencies and distortions derive both from the peculiarities of the technical characteristics of agricultural production processes, which make it difficult for individual agricultural enterprises to manage production factors efficiently and often do not allow for economical management conditions, and from the atomization of agricultural production (high number of small enterprises) and the consequent atomization of the supply of agricultural products. These peculiarities of the agricultural sector determine the need to aggregate the production of numerous companies (concentration of production supply) to meet the needs of buyers (processing and distribution companies), with numerous organizational and logistical problems. The specialization of agricultural labour must be added to these structural characteristics of the agricultural sector. Farmers, due to the limited size of their holdings but also for several reasons both of a technical nature are tied to the availability of labour and are increasingly inclined to specialize in the

more strictly productive phases, and often have great difficulty in directly following the post-harvest phases of their production cycle also due to the difficulties in accessing the information on markets that tend to be geographically broader and more complex and on consumer trends. It occurs that many fruit and vegetable companies, due to the limited size of the company, specialize in the purely productive phases in the field, neglecting the marketing and commercialization phase, which today are as important as production. This situation, which might have suited a production system of the past, is ill-suited to the agri-food models present in developed economies. As mentioned earlier, the ease of trade makes available in distant markets (from the places of production) agri-food products that are certainly cheaper than local production. As a matter of fact, following a logic of profit, food processing and distribution companies procure from companies that, both in terms of economic size and economic performance of the country, have lower production costs. In this situation, the pursuit of this strategy by the food industry and food distribution, there are problems with the outlet of the local production offer. Very often, there are higher production costs compared to international competitors. Finally, the character of fresh agricultural products (vegetables, fruit, grapes, olives, etc.) which are perishable (limited shelf life) and require high storage costs should not be forgotten. Hence the need for operators to carry out transactions in a short timeframe, the centrality of conservation and transport functions,

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the existence of conditions of great uncertainty concerning product quotations and the same sales possibilities that determine the contractual inferiority of farmers concerning companies operating in the 'upstream' (i.e. suppliers of technical means such as seeds, fertilizers, feed, etc.) and downstream (which are suppliers of technical means such as seeds, fertilizers, feed, etc.) and downstream (those that supply the final market with their product, such as wholesalers, exporters, the food industry and large-scale organized distribution), also determined by the growing concentration and internationalization of the sectors of the industry supplying technical means, the food industry and retail distribution. In this respect, recent years have seen an increase in the power of the upstream sector of agriculture and the downstream sector of the food industry and food distribution. In a way, we can say that agriculture finds itself squeezed between these two extremes: upstream the suppliers of raw materials, downstream the food industry and organized distribution where these too are very often the result of agreements between multinational companies. This increases the need to put in place coordination mechanisms between autonomous enterprises operating both within the same phase of the production process (in the same sector) and on different and vertically contiguous phases, i.e. in input-output relations; and, for the agricultural enterprise, it increases the need to counterbalance the bargaining power of its suppliers and customers. Many examples can be found in the literature that attempts to overcome these problems [2]. The answer is undoubtedly inter-firm coordination [3]. Inter-firm coordination makes it possible to realign the production processes of the different enterprises, facilitating market transactions and increasing the efficiency of the agri-food production process itself [4]. In general, it is possible to distinguish two types of coordination the horizontal one, which consists of the reunification within a single decision-making unit of equal phases of production processes previously carried out by divided autonomous enterprises, and the vertical one, which instead consists in the alignment of distinct and contiguous phases of the production process through more or less close agreements between autonomous decision-making units [5]. Through vertical coordination, the integrating entity (e.g. a farm) takes on the performance of one or more 'new' functions that it did not perform until then, which may be upstream functions (e.g. seed production) or downstream functions (e.g. processing of a certain agricultural raw material, which until then was sold to private enterprises) concerning the activity that was already carried out by the integrating entity. Vertical integration thus aims at better coordination of the different stages of a given agricultural and/or agro-industrial production process. The two forms of coordination can find a fusion in circular coordination, which consists of the possibility of simultaneously realizing a reunification of the same phases by aligning them with the previous and/or next phase. In this research, starting from these considerations, some possible strategies suggested by economic theory [6] and applied to the industrial sector are examined. In particular, it analyses the cultivation contract that agricultural enterprises can enter into to counter the phenomenon of marginalization that has been accentuated in the agri-food market that is increasingly dominated by multinationals and where agricultural enterprises are not only subjected to the price but also to the choices of the large groups that govern agri-food transactions at a supranational level. This research's novelty lies in applying Transaction Cost Theory to the agri-food sector.

2. Transaction cost theory

In the economic system, and thus also in the agri-food sector, in addition to market transactions, there is a plurality of different forms of vertical coordination. In fact, in the field of economic theory, among the most significant are joint ventures, cultivation contracts, and cooperative enterprises. In general, the question arises: why should enterprises resort to these forms of coordination instead of conducting transactions in the free market? Why might the pure market (spot and impersonal transactions) not prove to be the appropriate instrument for certain

types of vertical relationships between enterprises? That is, in what situations is there a need to abandon the use of the pure market and establish vertical relationships involving a greater degree of co-ordination and mutual commitment between the parties to the exchange? Alternatively, in which situations is it more appropriate to rely on the market for forms of coordination between different companies, rather than to carry out that specific transaction internally? An answer to these questions is offered by the Transaction Cost Theory [7]. The objective of Transaction Cost Theory is to understand the reasons behind the decisions of firms to produce internally make or to resort to buying goods on the market buy. More generally, the objective is to understand why firms, in coordinating vertically, resort to various types of mechanisms and may concern both extremes (make or buy) and 'hybrid' or intermediate forms, i.e. in which the entrepreneurial decisions of the two parties to the transaction (of the two firms) are neither completely separate (as is the case in further e-market or buy transactions) nor completely unified under a single decision-making centre (as is the case in full vertical integration or make), but are somehow coordinated, albeit with varying degrees of intensity. The point of departure is to consider how the market environment, and thus the market players and firms attract the market. It is well known that economic agents present bounded rationality, i.e. individuals act as intentionally rational agents, albeit within boundaries that make their actions and predictions imperfect due to the limits present in their cognitive, revisionary, technical capacity, and the time they have available to take in information and make decisions. In addition, economic actors behave opportunistically, i.e. individuals act in the pursuit of self-interest driven to the point of deception and fraud, e.g. by failing to pass on useful information to the other party, or by altering information, abusing the trust of the other party very often leading to market imperfection in favour of low low-quality of producing enterprises [8]. If individuals (and firms and other institutions) were endowed with unlimited rationality and did not have the tendency to engage in opportunistic behaviour, the pure market could function at zero cost, and thus be the best form of co-ordination when firms. However, the real world does not work this way, and therefore, as the Transaction Cost Theory suggests, the use of the market by a firm to purchase products or services entails the incurrence of transaction costs (or market usage costs) which, on the other hand, do not have to be incurred (or have to be incurred to a much lesser extent) if the firm decides to produce these products or services in-house.

3. Transaction cost theory and the agribusiness

Consider, for example, a food industry producing "caponata". The raw materials for the production of caponata are aubergines, celery, tomatoes, vinegar, capers and olives. If the market worked perfectly then the company with the know-how of caponata production could buy all the products from the market (from farms) and apply the production technique and produce caponata. However, as a function of the limited rationality and opportunistic behaviour that can be created in the market, the food industry that wants to produce caponata (which has the know-how) runs the risk of not being able to effectively and efficiently fulfil its function as a business because the quality of the raw materials supplied by the farms could be of low quality or it could risk that at times of production (given the seasonality of agricultural production) it does not have the raw material to process because the farms destine their production for other markets or businesses. This insight, which is present in the economic literature, has given rise to numerous applications and elaborations [9]. Market transactions thus entail costs (i.e. the market does not function at zero cost) that may concern: ex-ante costs: costs incurred by the enterprise in identifying the counterparty (research into the capacities of potential partner enterprises in the market), costs incurred in negotiating the terms of the exchange, costs incurred in defining the contents of the contract; ex-post costs: costs incurred in executing the contract, in checking that the transaction is carried out

within the agreed terms, costs incurred in checking that opportunistic behaviour is not being carried out, losses associated with a poor implementation of the contract. In these situations, i.e. in the presence of transaction costs, limited rationality and possible opportunistic behaviour that the counterparty may engage in, the solution of resorting to the pure market on the part of an enterprise may not always prove to be the most efficient and least costly. The magnitude of transaction costs varies depending on several factors such as the frequency of transactions: the higher the frequency of transactions, i.e. the number of times the transaction is executed in the unit of time, the lower the transaction costs; the uncertainty associated with these transactions, the greater the uncertainty, the higher the transaction costs; the level of specificity of the resources involved in the transaction, the greater the specificity of the resources, the higher the transaction costs. It is especially the specificity of resources that exposes the firm to opportunistic behaviour of the counterparty, and thus increases transaction costs, i.e. the costs associated with using the market. Resources are specific when they have a high return within a given transaction, but a very low return outside of it. This means that in-life transaction is unsuccessful, that resource cannot be quickly and efficiently diverted to alternative uses, as much of their value would be lost. This situation occurs especially in the agricultural sector for certain agricultural products that are specifically used in certain production processes. Thus, in the event of a failure of the transaction, the company with specific resources would have no way of repairing the loss. In this case, relying on the pure market, with the risk of not finding the buyer/seller at the last moment, is not advisable, especially if the uncertainty associated with the transaction is very high. There are many types of resource specificity.

4. Empirical evidence in agribusiness

Consider, for example, a business operating in the processing of agricultural products. It is then possible to assume that several situations occur. An enterprise that processes tomatoes with plants specialized in that processing, and therefore with plants that cannot be used for other purposes (e.g. cannot be used for processing leaf vegetables, or peas). If the enterprise is unable to obtain the desired quantities of tomatoes necessary for the optimal operation of the plant and realization of economies of scale since it cannot reconvert the resource (the processing plant) to other productions, it will have to remain with the plant unused, and thus suffer serious losses, because the plant cannot be reconverted 'state last minute'; in this case, therefore, there is a specific resource (asset) for that transaction (purchase of raw material/tomato) from the agricultural companies, which generates the need not be able to resort to the market, at least for all supplies. In this case, we speak of Physical asset specificity to indicate that the specificity of the resources used, and the result of a choice in a t-1 period (as in the case of processing plants) cannot be effectively utilized and cannot be reconverted in terms of financial capital in the short term to change the economic deb's destiny the investment that can certainly be made but in the medium to long term. In addition, it can be verified that a company with a high brand value (high reputation accumulated over time) cannot afford the luxury of suffering qualitative or quantitative deficiencies in its processing. In case of a qualitative deficiency in supplies, the company runs the risk of producing products of poor quality and in any case not in keeping with the company's reputation, and thus suffers damage that extends to the entire range of products offered under the brand name; even in this case relying on the pure market may not prove to be the best solution, because it could be the case that raw materials are not available in sufficient quantity and quality. One speaks in this case of Brand Name Capital (value associated with the company brand) to indicate that the reputation of the brand requires security of supply of the raw material to meet the needs of customers depending on the reputation the product brand has on the market. And again, it may be the case that a company has invested (sunk) resources and created special human competencies in the production of organic jams, and fails to get hold of the necessary

quantities of raw material from organic farming, it will be forced to under-utilized the specific resources and competences, incurring high costs of inefficient use of internal competences. This is referred to as human resources specificity, to indicate the know-how in terms of human capital that is undoubtedly the result of selection and preparation and has entailed costs for the company. The situation just described concerns companies in the food industry. However, agricultural enterprises can also show examples of resource specificity. For example, in the case of very perishable products destined for processing (tomatoes, fruit, leafy vegetables), location specificity can exert considerable weight. Waiting until harvest time and then deciding how and where to sell it (i.e. resorting to the pure market) can therefore expose the farm to high risks and thus losses of production and income. This is referred to as site specificity. Moreover, when the agricultural enterprise produces highly specific crops that have no other market than that of a single enterprise (processing, or a seed company), it is clear that if the enterprise that requires the cultivation of this specific variety, for whatever reason, decides not to purchase the product, the farm loses the entire possibility of recovering the investments made for that crop, in other words, no monetary outlay is matched by no monetary income. One speaks in these cases of Dedicated asset specificity [10].

5. Empirical evidence in agriculture

And again, if the entrepreneur has specialized in particular types of production processes, dedicating resources (time and money) to them, not being able to place their productions on the market entails unused or not fully utilized resources. These cases are easily found in the agriculture of many Sicilian, Italian and other territories, especially in those agricultural enterprises that specialize only in field cultivation. If these entrepreneurs fail to sell their products it is determined that they have employed resources that are not remunerated. We speak in these cases of human resources specificity. After examining these specific situations, we ask ourselves: make or buy? We find the answer in the Transaction Cost Theory which tells us that when resource specificity is high, the risks associated with a quantitative or qualitative shortage in procurement are high. In other words, in the presence of specific resources, i.e. locked in the transaction and not recoverable outside it, the market does not operate at zero cost, but there are high transaction costs, which are all the higher the more specific the resources are and the more the uncertainty factor (of the states of the world, but also that deriving from the behaviour of the other party, whether intentional or not) weighs heavily. In these situations, therefore, it is conceivable to abandon the pure market in favour of other solutions. In the agri-food system, and in particular, in the relations between agriculture and other sectors, there are further particular factors that, so to speak, aggravate the situation and make it advisable to abandon the pure market. This situation occurs when the quality of the agricultural product (and foodstuff) is often not observable, or at least not observable without very high costs (think for example of the production method, the use of particular seeds, treatments, and harvesting methods). Or when the agricultural product is a biological organism (perishability), and therefore the placing on the market (the transaction) cannot be too deferred in time to result in the loss of the product itself. And again when the peculiarities of the temporal structure of production (seasonality) require the development of all the tools to allow for quiet exploitation of the farm's basic factors. However, we should not forget other important aspects that emerge from the application of transaction cost theory to the agri-food sector. In fact, in the relationships between agriculture and other sectors, it is even less frequent to resort to full vertical integration 'make' because of the differences that exist between vertically contiguous stages along the supply chain [11]. In particular, the capital endowment required for the acquisition of stages is in any high. Furthermore, agricultural activities are characterized by the presence of low low-profiting (and higher riskiness), which make the acquisition of ownership of upstream agricultural activities (i.e. vertical integration of supplies) unattractive for a

processing or distribution company; it should not be underestimated that agricultural companies, as we know, are often heavily endowed with assets (land capital) and scarcely profitable. And again, it is well known that the optimal size (efficient scale) is different between vertically contiguous phases, also due to the more pronounced concentration in industry and distribution than in the agricultural phase. And lastly, we know that farms rarely have specialized production arrangements according to their business choices to diversify their product brings; there would thus, in the case of complete vertical integration, the presence of products related to the main products is not interesting for the economic activity of the integrated whole. Accordingly, in the relations between agriculture and other vertically contiguous sectors, and in particular with the processing industry and modern distribution, intermediate hybrid forms of coordination are employed between the pure market and full vertical integration, i.e. between make and buy, which were only considered at a later stage in the economic literature. In these different types of vertical co-ordination parties agree to assume obligations regarding their future conduct, resulting in interdependence and co-ordination of the decisions of the firms located at distinct but contiguous stages along the chain, along the production process.

6. Methodology

As is known from Economic Theory [12–14], small enterprises can be competitive if they have a defined target market. However, the increase in the market power of the food industry and food distribution requires the redefinition of business strategies towards forms that determine the conditions for being competitive in the market. Strategies to increase business competitiveness are historically determined. By this, we mean that a business strategy functions in a certain environment and under certain conditions, when these change, it is no longer valid. In this scenario, today small farms that are operating in a market of imperfect competition have the possibility of recovering margins of competitiveness through forms of coordination, and the vertical integration contract represents a valid tool that can be applied in all those contexts where we have a multitude of small farms and where the downstream part of the agri-food chain is dominated by large industrial groups (food industry and food distribution industry) [15,16]. This situation is also justified based on the companies (multinationals) that supply raw materials to agricultural enterprises which, as we know, are large industrial groups. To prove the economic viability of the cultivation contract, we ask the question: what determines vertical integration? There are three main reasons for this: diminishing returns on the entrepreneurial function within the new business structure (costs could increase with the addition of new transactions), wastage of resources (i.e. with vertical integration, the optimal allocation of inputs is increased), and input costs could increase with size. These three aspects determine the economics of adopting vertical coordination mechanisms and thus the cultivation contract. It is also well known that a firm will expand until the costs of organizing an additional transaction within the firm become equal to the costs of carrying out this transaction in the market, i.e:

$$C^l \text{ impr} = C^l \text{ merc} \quad (1)$$

where:

$C^l \text{ impr}$ = marginal cost per within the organizational structure
 $C^l \text{ merc}$ = marginal cost of the market transaction

Assume that two firms, A and B, can organize the same transaction at a cost below market cost. Both firms are of a size whereby:

$$C^l \text{ impr} < C^l \text{ merc} \quad (2)$$

The problem that arises is that increasing the number of transactions raises the cost of organizing. It is therefore plausible that with captive vertical integration, company A only takes control of B if the cost of

organizing the transactions (activities) of B does not exceed the cost incurred by B (alone) plus the market cost. However, for this to happen it must be ruled out that 1) the marginal (transaction) cost curve is non-linear; 2) for some transactions, the cost of organizing may be higher than the market cost; 3) that for those transactions the price mechanism would be more suitable. Then we can say that the enterprise will be larger when: 1) the cost of the f organization is low, and increases slowly; 2) the probability of the entrepreneur making mistakes is low/increases slowly; 3) the increase in the price of inputs is limited. However, it should not be forgotten that technological innovations can reduce the costs of organizing spatially distant transactions (this is the case with companies that relocate production or parts of it).

7. Results and discussions

In relations between agriculture and processing companies and/or large-scale organized distribution (buy it can also concern seed companies, or other food production companies) one of the forms of coordination that can be developed is that of the cultivation contract, also known as the vertical integration contract. Within the European Union, the use of this instrument derives in part from EU regulations: in fact, the public operator often makes the granting of public aid (interest or capital subsidies) envisaged for certain crops conditional on the presence of written cultivation contracts between agriculture and industry (e.g. in the case of processing tomatoes, tobacco, oilseeds, no-food crops). A cultivation contract is a contract drawn up between agricultural producers (individual or associated) and processing companies (individual or associated), whereby the agricultural producer undertakes to grow the crops or livestock from which the contracted product (agricultural or livestock product) is derived both the agreed specifications and technical criteria; Furthermore, it undertakes to deliver all the contracted production corresponding to the quality standards established in the contract; the processing (or distribution) company, on the other hand, undertakes to take back all the contracted production corresponding to the established quality standards, and undertakes to pay the price determined by the contract. The central aspects of the cultivation contract, re, therefore: the moment of stipulation (pre-sowing, pre-harvest); fixing the price or the way to determine it; fixing the quantities (or areas under cultivation); fixing the qualitative characteristics of the product; specifications on the factors and method of production: seeds of specific varieties, processing, harvesting, time and method of delivery, etc.; ways of controlling the process and the method of production; and the way of controlling the process and the method of production.; process and product control arrangements (e.g. field inspections); dispute settlement and penalty arrangements, the possibility of early exit; financing (advances, payment arrangements); provision of technical assistance. The intensity of the link between agriculture and industry, and in particular the degree of specification and control exercised by the buyer over the seller (agricultural producer), may vary according to the type of cultivation contract. That is, it is possible to distinguish between two broad categories of cultivation contracts: market contracts known as marketing contracts and production contracts known as production contracts regulate commitments only on compliance with certain product characteristics (quality, quantity), prices and delivery times, but do not concern how the product is produced. This implies a wide autonomy of the agricultural party as far as technical and entrepreneurial-organizational decisions are concerned. As far as production contracts are concerned, the buyer not only dictates the characteristics of the product but also exercises control over entrepreneurial decisions regarding techniques and the use of particular factors, i.e. the process. These contracts can be of two types production management contracts and resource-providing contracts. In the first case, the contract, in addition to the “market” elements, also contains specifications regarding the production techniques to be used (sowing times and methods, pesticide treatments, harvesting and packaging methods, etc.) without providing for the use of specific factors; in the second case

(resource-providing contracts), the contract provides for further specifications regarding the use (and possibly the supply) of certain inputs (e.g. seeds, pesticides, fertilizers) and technical assistance. The integrating company (the industry) is then also responsible for providing inputs and indications on cultivation techniques. Cultivation contracts offer advantages and disadvantages to both the agricultural enterprise and the buyer (industry or distribution). Whether there are advantages and disadvantages for one and/or the other party also depends on the content and type of the contracts used. For the agricultural enterprise, the advantages consist in the reduction of the commercial risk deriving from the certainty of the price (which it is set) and the placement of the product, sometimes multiannual; from this follows a greater possibility of specializing in cultivation systems and a greater possibility of increasing yields through learning processes (knowledge economies, learning by doing), as well as the possibility of making investments even in the medium to long term, if the contract is multiannual and if adequate guarantees are provided. In addition, entering into a cultivation contract allows access to resources that would otherwise not be available, such as information and knowledge deriving from technical assistance and technological innovations that in some cases the other party provides, as well as financial assistance (e.g. in the form of advances for the purchase of certain factors, such as seeds or fertilizers required to carry out the production process). The disadvantages for the agricultural enterprise may be represented by the partial loss of entrepreneurial and managerial autonomy of the entrepreneur (especially in production contracts) and in the impossibility of benefiting from market (and price) trends that are more favourable conditions than those established in the contract. In some cases, there may also be greater uncertainty as to the results of the innovations in the production factors and processes required (different cattle feeding techniques, different phytosanitary treatments, different types of harvesting machines, etc.) or of the product (new varieties, new crops, new animal breeds, etc.). On the other hand, for the food industry distributors signing cultivation contracts with agriculture, there can also be advantages and disadvantages. Among the advantages are the greater security of supply of raw materials, which allows for greater programmability of processing and greater use of the company's facilities and resources, and the prior quantification of the price (which it is determined), which allows for better financial management and economic calculation, and the possibility of controlling the 'quality' of raw material supplies. Disadvantages include the inability to benefit from favourable market trends, increased administrative costs for contract drafting and management, and the costs of monitoring compliance with contract performance. In some cases, the use of cultivation contracts (in both market and production contracts) is aimed at obtaining more power along the supply chain. Three ways in which contracts can increase the market power of one of the parties to the transaction, under certain market conditions, can be identified: barriers to entry (restricting entry). When the transformation phase adopts technologies that allow significant economies of scale, the entry of new companies into the market is made difficult (barriers to entry). Furthermore, companies already operating on the market can use vertical integration contracts as an additional deterrent: if in fact, they manage to absorb a significant part of the local supply of raw materials through contracts, the company that wants to enter will have to pay an extra premium to eliminate existing contracts from the market; Discriminatory Pricing a buyer may pay different prices to sellers for the same product. For example, when a buyer has market power it exercises by restricting purchases and reducing prices. At this point, the buyer could increase his profits by buying and processing an additional quantity of product, but only if the higher price paid could only be paid for those additional quantities, without leading to an increase in prices for all supplies. For example, it could only offer a contract to a company in another area at a price above the market price; restricting price competition limits price competition contract may be structured (in the same way as in other production sectors) to discourage competitors from competing aggressively against each other. Industrial companies

may agree to include a clause in their contracts to set prices by reference to the highest market price in a given period (top of the market clause). By doing so, the industrialists have no incentive to trigger an upward race on spot market purchases, as they would otherwise also raise the price offered to contracted producers. Another example might be to include confidentiality commitment clauses in contracts, which require farmers to keep the details of the contract secret (especially from other farmers). This clause can offer the buyer strong information advantages in negotiations. Cultivation contracts have become widespread in recent years in Sicily between food industry companies and agricultural enterprises. This situation arose from a twofold need: on the one hand, the farmers to have a remunerative price higher than the normal market price; on the other hand, the food industry to have a safe product and a guarantee of quality. In particular, cultivation contracts were made for the valorization of legumes (chickpeas, lentils, etc.). In the contract, the food company undertakes to buy the product at a price set at the beginning of the campaign. It will then handle the processing of the product post-harvest to packaging and shipment to the distribution companies. On the other hand, the farmer undertakes to grow for the food company. According to the information gathered, contracts that have been in place for several years continue to be practised because there is a mutual economic benefit for both the industry and the farmer. For the form, there is an advantage in the quality of production, for the latter in the higher selling price but above all in the guaranteed market outlet. This study, compared to previous studies [17,18], considers the possibility of competing and creating conditions for the long-term growth and development of small farms. While previous studies were unrelated to the territorial context [19–21], the present study looks at a resilience perspective of farms in the territory in that through the vertical integration contract, those conditions for long-term competitiveness are created.

8. Conclusions

The opening of agri-food markets determines the redefinition of the competitive strategies of enterprises. In this paper, we have analyzed how the opening of trade can cause many farmers to abandon their business activities because they are not competitive and their productions do not find an adequate outlet and thus value in the market through transactions. In this situation, Transaction Cost Theory suggests, where possible, vertical integration in the various forms we have discussed. Certainly, in the future, agricultural enterprises should make use of these tools made available by economic theory and in certain contexts also by legislation. These tools allow the enterprise to enhance production and remain competitive in the market with benefits for both the territory and the socio-economic context where it is located. Ultimately with the present research, we have tried to answer some questions to the question of how small farms can benefit from the application of Transaction Cost Theory. Small farms can benefit from the proposed model when there is an economic convenience to join the cultivation contract. In many marginal territories, this convenience is plausible not only because the cultivation contract allows me to have a secure outlet market for the farm products but also because it increases the technical and economic efficiency of the farm structure. However, we must say that there are limitations that could be encountered through these forms of integration which is represented by the fact that the farmer would only produce according to what the food and distribution industry demands with negative effects on plant and animal biodiversity. This study can be applied in all those contexts where there is marginal agriculture in economic terms (modest Net Incomes) and where there are not those conditions to create competitiveness on their own. In our opinion, the cultivation contract is undoubtedly a strategy to increase farm competitiveness however one must not lose that farm autonomy to produce according to local biodiversity. So welcome these forms of coordination however one must not lose the local biodiversity that is a strength of agribusiness and farmers who over time have established a

harmonious relationship with the land.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

References

- [1] S. Vieri, *Agricoltura e sostenibilità. Dall'equilibrio al conflitto*, Libreriauniversitaria, 2020.
- [2] M. Bisceglia, J. Padilla, S. Piccolo, S. Shekhar, Vertical integration, innovation and foreclosure with competing ecosystems, *Inf. Econ. Pol.* 60 (2022), 100981.
- [3] B. Hansen, K. Miller, C. Weber, Vertical integration and production inefficiency in the presence of a gross receipts tax, *J. Publ. Econ.* 212 (2022), 104693.
- [4] H. Asadikia, S.H. Mosavi, M.R. Reed, S. Khalilian, H.N. Alamdarlo, The dilemma between imported versus domestic trout egg: roles of vertical integration and input prices, *Aquaculture* 554 (2022), 738131.
- [5] S. Young, K. Swarts, S.J. Prior, D. Doherty, S.J. Campbell, Vertical integration in the Australian community care setting: can it work? A theoretical review of current literature, *Int. J. Health Plann. Manag.* 37 (3) (2022) 1299–1310.
- [6] G.C. Amado, D.C. Ferreira, A.M. Nunes, Vertical integration in healthcare: what does the literature say about improvements on quality, access, efficiency, and costs containment? *Int. J. Health Plann. Manag.* 37 (3) (2022) 1252–1298.
- [7] F. Del Bono, S. Zamagni, *Microeconomia*, Il Mulino, 1999.
- [8] L. Bechetti, L. Bruni, S. Zamagni, *Microeconomia*, Il Mulino, 2010.
- [9] C. Ménard, E. Valceschini, New institutions for governing the agri-food industry, *Eur. Rev. Agric. Econ.* 32 (3) (2005) 421–440.
- [10] G. Belletti, A. Marescotti, Coordination mechanisms in the agro-industrial system. The case of high-oleic sunflower, in: G. Galizzi, L. Venturini (Eds.), *Vertical Relationships and Coordination in the Food System*, Physica-Verlag, Heidelberg, 1999, pp. 469–486.
- [11] S. Vieri, *Agricoltura. Settore Multifunzionale Allo Sviluppo*, Edagricole, 2012.
- [12] A. Balmann, K. Dautzenberg, K. Happe, K. Kellermann, On the dynamics of structural change in agriculture: internal frictions, policy threats and vertical integration, *Outlook Agric.* 35 (2) (2006) 115–121.
- [13] C.L. Delgado, Sources of growth in smallholder agriculture integration of smallholders with processors in subsaharan Africa: the role of vertical and marketers of high value-added items, *Agrekon* 38 (SUPPL.1) (1999) 165–189.
- [14] A. Albanese, Vertical integration contracts in agriculture: fair trade and efficiency of the food Chain, *Envisioning a Future Without Food Waste and Food Poverty: Societal Challenges* (2015) 89–93.
- [15] F. Sgroi, Territorial development models: a new strategic vision to analyze the relationship between the environment, public goods and geographical indications, *Sci. Total Environ.* 2021 787 (2021), 147585.
- [16] Y. Bilan, V. Nitsenko, V. Havrysh, Energy aspect of vertical integration in agriculture, *Rynek Energii* 132 (5) (2017) 98–110.
- [17] F. Sgroi, Forest resources and sustainable tourism, a combination for the resilience of the landscape and development of mountain areas, *Sci. Total Environ.* 736 (2020), 139539.
- [18] F. Sgroi, F. Piraino, G. Garifo, F. Modica, M. Ingrassia, Information asymmetry in the agri-food sector and territorial marks: the case of the olive oil Val di Mazara PDO, *J. Agri. Food Res.*, 2022 9 (2022), 100337.
- [19] D.V. Bogachev, Transformation of the agriculture in Russia: significance of present-day vertical integration, *Reg. Res. Russ.* 5 (4) (2017) 392–401.
- [20] F. Sgroi, Evaluating of the sustainability of complex rural ecosystems during the transition from agricultural villages to tourist destinations and modern agri-food systems, *J. Agri. Food Res.*, 2022 9 (2022), 100330.
- [21] F. Sgroi, The circular economy for the resilience of the agricultural landscape and promotion of the sustainable agriculture and food systems, *J. Agri. Food Res.*, 2022 8 (2022), 100307.