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Framework for Analysis of Agrarian Contracts

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Abstract

This paper incorporates the interdisciplinary New Institutional and Transaction Costs Economics (combining Economics, Organization, Law, Sociology, Behavioral and Political Sciences) and suggests a holistic framework for analysis of agrarian contracts. First, it specifies type and importance of different mechanisms of governance of agrarian activity. Second, it defines the essence, and classifies types and features of agrarian contracts. Next, it identifies technological, institutional, behavioral, dimensional, and transaction costs factors for contractual choice, and specifies effective modes for contractual arrangements in agriculture. Finally, it determines the effective boundaries and sustainability of farm and agrarian organizations.

Key words: contract management, type of agrarian contracts, factor and efficiency of contractual choice, economic boundaries and sustainability of farm, agrarian governance

Introduction

A significant part of *farmers relations* with other agents are *governed through various contracts*. For instance, when chemicals or fuel are purchased on market a *spotlight contract* is used, indicating an acceptance to acquire a particular good for a certain price agents obligation for at spot payment. When a labor is hired an *employment contract* is applied stipulating negotiated terms on how labor will be used, conditions and terms of work, modes of payment etc. In marketing of farm produce *long-term contracts* with wholesales, processors, and food-chains are frequently used specifying quantities, qualities, time of deliveries, prices etc. When a farmer sets up or joins a cooperative (firm) he signs accepting the terms of organization's *constitutive contract* with members' rights and obligations.

Forms and factors of agrarian contracts have been intensively studied during the last twenty five years around the world [Bachev and Tsuji; Eswaran and Kotwal; Guo, Jolly and Zhu; James, Klein and Sykuta; Hayami and Otsuka; Little and Watts; Sporleder; Swain; Wilson]. A considerable progress has been made in understanding the economic logic and efficiency of contractual choice, "make or buy decision", sharecropping and employment arrangements, vertically integrated forms, industry and countries specificities etc. Most studies focus on a particular type contract (land tenure, employment), a specific functional area of farming activity (land or labor supply, marketing), a certain factor of contractual choice (agency or transaction costs, agents opportunism) etc. At the same time, a little attention is put on importance and combination of institutional, behavioral, economic, technological, ecological etc. factors of contractual choice as well as on comparative efficiency, interdependency and complementarities of different governance arrangements.

In this paper we incorporate the interdisciplinary New Institutional and Transaction Costs Economics (combining Economics, Organization, Law, Sociology, Behavioral and Political Sciences) and suggest a holistic framework for analysis of agrarian contracts.

First, we specify type and importance of different mechanisms of governance of agrarian activity. *Second*, we define the essence, and classify types and features of agrarian contracts. *Next*, we identify technological, institutional, behavioral, dimensional, and transaction costs factors for contractual choice, and specify effective modes for contractual arrangements in agriculture. *Finally*, we determine the effective boundaries and sustainability of farm and agrarian organizations.

1. Mechanisms of governance of agrarian activity

In modern society resources, activities and interactions of individual agents are governed by a number of distinct mechanisms (Figure 1).

First, institutional environment or the “rules of the game”– that is the distribution of rights and obligations between individuals, groups, communities, and generations, and the system(s) of enforcement of these rights and rules [Furuboth and Richter; North]. The spectrum of rights could embrace the material assets, natural resources, intangibles, certain activities, labor safety, clean environment, food security, intra- and inter-generational justice etc. A part of the rights and rules are constituted by the *formal* laws, regulations, standards, court decisions etc. In addition, there are important *informal* rules and rights determined by the tradition, culture, religion, ideology, ethical and moral norms etc. The enforcement of various rights and rules is done by the state (administration, court, police) or other mechanisms such as community pressure, trust, reputation, private modes, self-enforcement etc.

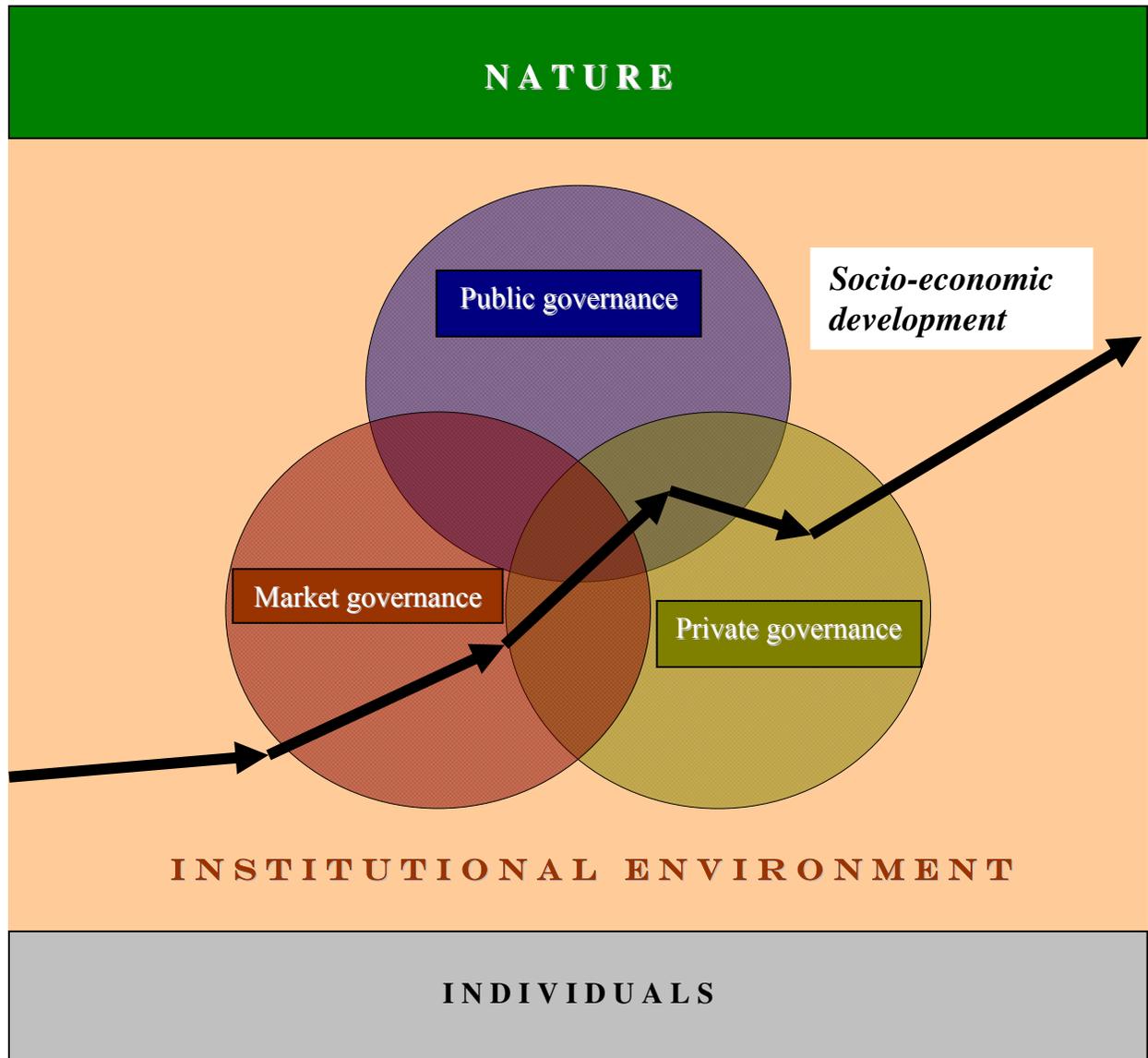
Institutions and institutional modernization create dissimilar incentives, restrictions and costs for intensifying exchange, increasing productivity, inducing private and collective initiatives, developing new rights, decreasing divergence between social groups and regions, responding to ecological and other challenges. For example, (socially) acceptable norms for use of labor, plant and livestock, and environmental resources, all they could differ even between various regions of the same country.

The institutional “development” is initiated by the public authority, international actions (agreements, assistance, pressure), and the private and collective actions of individuals. It is associated with the modernization and/or redistribution of the existing rights; and the evolution of new rights and the emergence of novel (private, public, hybrid) institutions for their enforcement. Specific institutional environment is a *key parameter* which eventually determines the potential for and the particular type of development in different communities, regions, and countries [North].

In the modern society a great deal of individuals’ activities and relations are regulated and sectioned by some (general, specific) formal and informal institutions. However, there is no perfect system of preset outside rules that can govern effectively the entire activities of individuals in all possible (and quite specific) circumstances of their life and relations. Principally individual agent finds out (can not change) the institutional

environment and frequently there is not a voluntary (“contractual”) choice - agent is to follow socially imposed rules of the game otherwise risks to be punished.

Figure 1: Mechanisms of governance of agrarian activity



Second, “invisible hand of free market” (market price movements, market competition) which importance for the coordination (direction, correction) and stimulation of economic activities, exchanges and allocation of resources is among fundamentals of political economy for more than 200 years. Individual agents use (adapt to) markets benefiting from specialization and mutually beneficial exchange (trade) while their voluntary and decentralized actions govern overall distribution of activities and resources between activities, sectors, regions, countries.

Generally, individual agents can not affect the price level (“price taking”) but are free to accept or not (a voluntary contract) whether to use certain markets, counterparts, prices etc. and take associated costs and risks. However, there are also instances of lack of individual choices and unwanted exchanges (contracts) - e.g. missing markets, monopoly and power relations, externalities etc. Consequently, free market “fails” to govern effectively the entire activity, exchanges, and resources of individuals.

Third, private modes (“*private or collective ordering*”) – those are diverse private or collectively designed special contractual and organizational arrangements governing bilateral or multilateral relations between private agents. Individuals take advantage of institutional, market etc. opportunities and deal with institutional and market deficiency by selecting or designing mutually beneficial private modes (rules) for governing of their relations and exchanges. Private mode negotiates own rules or accepts existing private (collective) order, transfers existing rights or gives new rights to counterpart(s), and safeguards absolute (assigned by institutions) and/or contracted rights. In most cases private governance is based on voluntary and mutually beneficial contracts. However, there are instances of unwanted private or collective order (contract) caused by a monopoly or a power situation of some private agents.

In modern society a great part of agrarian activity is governed by private negotiations, “visible hand of the manager”, or collective decision-making. Nevertheless, there are many examples of “private sector deficiency and failures” in governing of socially desirable activity such as environmental preservation, food security etc.

Forth, public intervention (“*public order*”) – these are various forms of a third-party public (Government, community, international) involvement in market and private sectors such as public guidance, public regulation, public taxation, public assistance, public funding, public provision, property right modernization etc. Public modes are both mandatory and voluntary (e.g. public contract) for private agents.

The role of public (local, national and transnational) governance has been increasing along with the intensification of activity and exchange, and the growing interdependence of social, economic and environmental activities. In many cases, the effective organization of certain activity through a market mechanism and/or a private negotiation would take a long period of time, be very costly, could not reach a socially desirable scale, or be impossible at all. Thus a centralized public intervention could achieve the willing state of the system faster, cheaper or more efficiently. Nonetheless, there are a great number of bad public involvements (inaction, wrong intervention, over-regulation) leading to significant problems of sustainable development around the globe.

Fifth, hybrid forms – some mixture combining features of market and/or private and/or public governance.

“Governance matters” and depending on the (*efficiency of*) *system of governance* “put in place”, the *outcome* of the development is quite different with diverse levels of socio-economic progression and environmental conservation (Figure 1). Subsequently there has been quite unlike results of agrarian transition of different industries and countries.

2. Essence and types of agrarian contracts

The contract is a mean for voluntary exchange of rights and obligations between two or more parties by which they govern their relations in mutual benefit. The rights that agents give and receive could be on natural resources, material and financial assets, liabilities etc. The subject of contract are rights agents really possess as right of ownership, rights of management, user rights, rights to generate income etc. Rights can be transferred entirely (sale) or partially (lease). The exchange can occur instantly in the present (cow against money) or in some moment or period of time in the future after contracting (sale of future yield, land lease etc.). The later open up possibility some of the parties to “steal” rights (non-fulfilment of promises) transferred with a contract [Furuboth and Richter].

Initial distribution of rights and obligations between agents in society is done by laws and regulations, tradition, moral, religion and ethical norms etc. In modern society a great part of relations between agrarian agents are regulated (governed) by laws and formal norms. For instance, it is not allowed to trade farm products not meeting formal standards for quality and safety; subject of sale could be only the right to use labor but not the personality of the worker; employment of children is forbidden; marketing of certain products is to be done at fixed prices or by certified organizations etc.

Preset outside rules and restrictions (should) facilitate relations of economic agents. However, they can hardly regulate all their aspects in the specific conditions of individual agents. The contract is the mean by which individual agents optimize relations creating private rules of exchange (owned private rights) adapted to their specific conditions and needs [Williamson]. The only formal (institutional) restriction is that private contract must not contradict laws and harm interests of third parties. Furthermore, there are widespread *informal* (unwritten) contracts which enforcement through formal (e.g. court) system is difficult or impossible¹.

There is a big variety of contractual relations in which agrarian agents participate or may take part. Particular type of contracts have different specific characteristics – specific subject, formal requirements, possibility for effective transfer and protection of various rights, costs for preparation, enforcement, disputing, and termination of contractual terms. Rational agrarian agents take into account the potential, advantages and shortcomings of divers contractual forms when choose modes for governing of their relations with other agents.

A particular attention is put on assessment of possibilities for *opportunistic behavior* of counterparts and inclusion of special contractual terms for safeguard against it. Tendency for opportunism means that if there is an opportunity for a party to get non-punishably an extra rent from exchange (performing unwanted exchange by others) the agent will likely “steal” the rights of others [Williamson].

Agrarian contracts can be classified in some of the following categories:

- ***Sale-purchase contract*** – that type of contract *arranges a permanent transfer of rights on particular resource or object against payment of a certain price.* The major risk for buying farmer is from *pre-contractual opportunism* of seller. The buyer usually does not have full information for the quality of acquired object, and seller is not interested in revealing the existing shortcomings. For instance, when a second-hand tractor is

¹ Nevertheless they are quite effective and broadly applied in agrarian sector of transitional, developing and developed countries alike.

purchased it is difficult to evaluate whether the technical state correspond to the claims of seller (problems appear later on during exploitation); real yield of a new seed variety is discovered in cropping time etc. In order to safeguard against these risks a preliminary testing, trying period before final purchase, giving guarantee by seller etc. are negotiated

There is also possibility for *post-contractual opportunism* if a long-term asset (e.g. equipment) combined with after-sale technical service is purchased. Since the trade is completed (money transferred) the promise for future servicing is not fulfilled or it is executed badly or with delays. The opportunistic behavior of seller decreases (self-restricted) when a long-term contract is employed or there is a high likelihood for new contracts between counterparts in future.

Farmer as a seller often faces post-contractual opportunism in terms of delayed payment or non-payment for marketed farm output. In order to protect from this risk a safeguard term (e.g. advance payment, cash payment) is applied or interlink deals is contracted (crediting and/or inputs supply by buyer against marketing of farm produce). In any case, risk diminishes considerably when farmer chooses a seller/buyer to whom he *trusts* or selects market agents with built *good reputation*.

- **Lease contract** – this type of contract *arranges the transfer of right on a temporary use of certain resource or object against payment of a rent*. Major risks for farmers here are from *pre-contractual opportunism* associated with the quality of leased item (similar to a purchase contract) and from employment of a *fix rent*. When a fix rent is contracted the tenant takes the entire risk of losses (or benefits) from the variation of productivity and income of leased resource (object, land, animal). That risk could be *shared* with the owner through contracting a *share rent* or even entirely eliminated through applying a *market rent*.

The lease contract also gives possibility for *pre- and post-contractual opportunism* from the lease-holder. In the former case, the tenant does not declare his intention to use ineffectively leased resource (object) while in the later case he is practicing such behavior (bad maintenance of leased building and equipment, poor care of leased animals, improper crop rotation, insufficient compensation of nutrition intakes through fertilization etc.). Moreover, it is common a delayed or non-payment of contracted rent by tenants.

- **Employment contract** – this contract *arranges the right to receive a particular service from hired for a certain period of time labor against payment of salary or wage by the employer*. Special feature of this “service” contract is that the one party (the employer) acquires the right to *direct, control and fire* another side – thus there is a *relation of subordination*. This mode gives possibilities for *rapid adaptation* to current labor needs of farm. Alternatively either is has to be prepared a very detailed service contract (with relevant rights and obligations of partners in all possible contingencies during the period of relationship) or to permanently (re)negotiate new contracts along with changing conditions and needs of each partner.

Major risks for farmers associated with this type of contract are from *pre- and post-contractual opportunism*. In the first case, the worker could misinform for his capabilities or intentions in order to get the job. Farmers can protect asking recommendations, selecting candidates with certain education level or training certificate, organizing interview and/or test for determining the applicant’s ability etc. In the second case, worker may not put the necessary (contracted) efforts after receiving the job. The later is

facilitating by the fact, that in agriculture permanent supervision of labor is impossible and/or productivity is not always proportional to the labor input (e.g. positive or negative impact of climate factor). Besides, a highly qualified worker may leave the job in a critical for the farm moment (e.g. combine operator during harvesting time) because of offered higher salary by a competitor farm.

In order to restrict these forms of opportunism farmers apply: a permanent employment contract, appointment of team-leaders (supervisors), output-based compensation, payment of bonuses, give incentives for improving productivity through labor participation in farm management, rights for pay holidays, providing free services, housing etc.

- **Service contract** – this type of contract *arranges the right to receive a certain service against payment of a price*. The service could be *material* (cultivation of land, plant protection, transportation, advertisement, software) or for *accomplishing a particular task* (maintenance of equipment, veterinary service, agronomic advice, education, guarding).

Unlike employment contract here both sides are in *equal* position (rather than subordination). In many instances, the farmer is not even able to “direct” service provider as it is with medical treatment, education, consulting, guarding etc. Frequently it could be utilize an output-based payment which significantly restricts the opportunism of service supplier. Nevertheless, often the employment of a time-based or fixed payment is the only possible option. Principally a long-term supply contract improves the quality of provided service – getting familiar with a particular farm (land parcels, equipments, animals), desire to keep or renew the contract etc. In any case, selection of a supplier with a good reputation diminishes the risk from opportunistic behavior.

- **Loan contract** – this type of contract *arranges a temporary transfer of property right on some amount of money (money loan) or products (loan in kind) against payment or not of a certain price (interest)*. Unlike lease contract the debtor is not obliged to return the identical money/products which are borrowed, but just the same *quantity* of borrowed assets (usually with some interest above the loan).

In modern conditions most common is the contract for money loan from a commercial bank, private individual or firm. The control over utilization of the loan by the creditor is very difficult because of the high “mobility” of money. In order to avoid the opportunism of debtor a strict selection of applicants is practiced (studying out credit history, reputation, papers of property ownership; requirement for guarantors), and a significant collateral, guarantee and/or coo-financing is requested. All these considerably increase the cost of using that type of contract by farmers.

Increasingly other *more-efficient* forms for giving loan are applied *in package with sale of long-term assets* (leasing), *short-term assets* (in installments or delayed payments), or *interlinked credit against marketing of farm output/services*.

- **Insurance contract** – this contract *arranges the transfer of particular risk-taking during a period of time against payment of a certain price*. When event (incident) covered by insurance contract occurs, the insurer pays an insurance premium according to negotiated terms. Assurance is offered (sold) against various risks - *damages on property, yield, animals and persons* caused by *natural* (hail, frost, storm, flood, fire), *health* (injury, disease, dead) or *social factors* (destruction, theft).

Usually, opportunism may occur by insured person before signing the contract (not disclosing the real information for possible risks) or during contract execution period (not taking actions for reducing damages when event occurs; consciously provoking damages in order to get insurance premium etc.). That augments considerably the insurance prices and restricts utilization of insurance contracts by farmers.

On the other hand, farmers often “discover” the pre-contractual opportunism of insurers only after the occurrence of harmful event. Then they find out that not all assurance terms (protected risks, extend of coverage of damages, ways of assessment of damages, payments etc.) had not been well explained and/or adapted to farmers needs before signing the contract.

What is more, for many risks farmers can not purchase insurance at all – risk of lack of market demand of farm products, fluctuation of prices of farm produce, possible opportunism of counterparts in contractual relations etc.

- **Coalition contract** – this type of contract *regulates rights and obligations in coalition of actions and/or resources of two or more agents. Members of the coalition exchange certain rights associated with the ownership, control and direction of particular resources, management of the coalition, distribution of income and other benefits of the activity, coalition period, ways of expansion of the coalition and termination of membership etc.*

According to specific goals it may be established different *type of coalitions* – informal partnerships (coalition of resources and/or activity), cooperatives (non-for profit), firms (profit-making), associations (collective actions) etc.

For this type of contract most often there is risk for *post-contractual opportunism*, when some member(s) does not fulfill obligations to coalition or uses improperly the organization in own private interest. In order to avoid that risk partners with high mutual confidence (family members, relatives, friends) are selected, and the membership of coalition is restricted (mutual control on opportunism is practically possible). In coalition with *open membership* (cooperative, corporation) effective mechanisms are put in place to motivate members (preferences for working members of coalition) and secure direct members participation in the management and control of coalition.

In a very big open membership coalition it is possible a particular *pre- and post-contractual opportunism* as well. Creation and development of such coalition is associated with significant costs (for initiation, establishment, registration, organizational modernization) while the efficiency and sustainability of the new form is uncertain. That is why there are no incentives for individuals to participate in that process and make necessary investments. However, in case of a successful organization, the willingness to join and benefit (“free-riding”) from new coalition greatly increases.

3. Factors for choice of contract form

In rare cases there is only *one practically possible* form for governing of agrarian activity. For instance, a *natural minimal size* of farm organization is determined by a technological parameter such as *non-separability* of activities (e.g. a biological nonseparability of individual animal). Also in Japanese dispersed paddy agriculture water supply could not have been conducted by individual farmers (high interdependency,

nonseparability of water use) and since earliest period water use organization developed as public projects [Mori]. Effective governance of some environmental activities requires a certain scale and thus collective actions at local, regional, national or transnational scale [Bachev 2009]. Nevertheless, beside few examples, in farming is almost impossible to find cases where the choice of form of governance is unilaterally determined by *technological parameters*.

Another technological factor which could define the mode of governance (e.g. farm size) is possibilities to *explore technological economy of scale and scope*. For instance, in order to use a large combine capacity a farmer increases operational size; or he produces two or more products under different technologies in order to use “free” resources (e.g. available family labor). Nevertheless, development of technology usually follows demand and in fact is a changeable parameter as well². Moreover maximum economy of scale can be reached not through internalizing activity but by market exchange with a specialized activity - e.g. selling or buying harvesting service. Free farm resources could also be traded (sell, lease out) more effectively in market place instead of using them in own non-specialized activities (opportunity costs reason).

In fact there is an opposite tendency in the real agrarian economy - dependence of technological development from the governance structure. It is common when institutional restrictions (for land transfer, hiring labor etc) and high level of transaction costs (e.g. for outside credit supply) prevent exploration of the potential of available technologies. Domination of primitive technologies is a rule rather than an exception in the farming sector of transitional and developing countries. In other instances, high transaction uncertainty or imperfect institutional arrangements extend farming organization far beyond “technologically optimal” size. For instance, it has been typical “over-concentration” of East-European agriculture during communist era, and “over-integration and over-cooperation” in transitional period thereafter [Bachev 2006].

Often the choice of governing mode is pre-determined by *institutional restrictions* as some forms for carrying out farming activities, land and labor supply, trade of output etc. could be socially unacceptable or illegal in certain countries or period of time. For instance, corporate and cooperative organization of farming is forbidden in many countries; market trade of farmland, natural resources, and some outputs (inputs) is illegitimate, private management of natural ecosystems (parks, reserve zones) is not allowed etc. Nevertheless, when costs associated with the illegitimate governance is not high (possibility for disclosure low, enforcement and punishment insignificant) while benefits are considerable, then the more effective modes prevail – large gray or black sectors of economy are common around the globe.

Principally, the choice of contractual form will greatly depend on the *efficiency of (outside) institutional environment* – regulation, stability and enforcement of property rights; extend of direction of private relations, possibility for rapid and costless dispute resolution, efficiency of punishment of offenders etc. For instance, in conditions of well-working public system of regulations (quality standards, price guarantees) and laws and contract enforcement a preference will be given to spotlight and classical (standard) contracts. On the other hand, if rights on major agrarian resources are not defined or not well defined, and absolute and contracted right effectively enforced (as was the case during most of the post communist transition) that lead to domination of primitive

² Otherwise it is very difficult to explain widespread distribution of small scale machinery in agriculture.

subsistence farming, informal, personal and over-integrated forms, unsustainable organizations, undeveloped and missing markets etc.

Usually, every agrarian activity and exchange could be governed through a great variety of *alterative* forms. For instance, cultivation of land by a tractor can be governed in different ways: a farmer can buy (unified ownership), rent (rent contract) or lease a tractor (input and credit supply interlinked contract); farmer could buy cultivation service from market (contract service); number of farmers may buy a tractor (joint ownership) and use it in a group (producers cooperative) or individually; farmer can join a cooperative providing cultivation services (non for profit organization); farmers may lease land out to a tractor owner and share output (share tenancy contract); farmer can hire a tractorist to work on farm (employment contract), and may even sell out cultivation service to market (profit making organization); cultivation service to farms could be subsidized by Government (trilateral mode), or provided by a municipality or state company (public organization).

One *extreme* for the farm manager is to specialize exclusively in governing of market transactions rather than production management³. For example, leasing-in farmland and long-term material assets, purchasing all services for cultivation and harvesting of output, buying needed short-term material assets, selling all primary products on market. *Another extreme* is a close internal organization such as one-person or group subsistent farm - farmer(s) employ only own resources (land, labor, technological knowledge) and consume the entire product. Between these two polls there is a spectrum of feasible modes for governing of agrarian activity and exchange: various sort long-term contracts, association, cooperation, interlinked organization, hybrid forms, farms of different type (partnerships, corporations, complex hierarchies) etc.

The different governance modes are alternative but not *equally efficient* modes for organization of activities. Each of them has distinct *advantages* and *disadvantages* to protect individuals rights and investments, coordinate and stimulate activities, explore economies of scale and scope, save production and governance costs etc.

The *free market* has a big coordination and incentive advantages (“invisible hand of market”, “power of competition”), and provides “unlimited” opportunities to benefit from specialization and exchange. However, market governance could be associated with a high uncertainty, risk, and costs due to price instability, great possibility for facing an opportunistic behavior, “missing market” situation etc.

The *special contract form* (“private ordering”) permits a better coordination, intensification, and safeguard of activity. However, it may require large costs for specification of contract provisions, adjustments with constant changes in conditions, enforcement and disputing of negotiated terms etc.

The *internal (ownership) organization* allows a greater flexibility and control on activity (direct coordination, adaptation, enforcement, and dispute resolution by a fiat). However, extension of internal mode beyond family and small-partnership boundaries (allowing achieving the minimum technological or agronomic requirements; exploration of technological economies of scale and scope) may command significant costs for development (initiation and design, formal registration, restructuring), and for current

³ That is not a hypothetical case – “contract farming” is quite popular in Japan where many part-time “farmers” contract out most or all of major paddy operations to professional (specialized) farms.

management (collective decision making, control on coalition members opportunism, supervision and motivation of hired labor etc.).

Separation of ownership from management (cooperative, corporation, public firm/farm) gives enormous opportunities for growth in productivity and transacting efficiency – internal division and specialization of labor; exploration of economies of scale and scope; introduction of innovation; diversification; risk sharing; investing in product promotion, brand names, relations with customers, counterparts and authorities. However, it could be connected with huge transaction costs for decreasing information asymmetry between management and shareholders, decision-making, controlling opportunism, and adaptation. The *cooperative* and *non-for profit form* also suffers from low capability for internal long-term investment due to non-for-profit goals and non-tradable character of shares (so called “horizon problem”).

The choice of contractual form also depends on *personal characteristics* of individual agents – preferences, knowledge, capability, experience, risk-aversion, reputation, trust, “contract” power etc. For instance, farming organization is often restricted to a family partnership. Moreover, if farmer is a good manager he will be able to design, control and implement more efficient form adapted to his specific needs (e.g. effective management of more contracts for outside supply with specialized services and/or inputs). Similarly, high risk-taking farmer will prefer more risky but productive contractual forms (e.g. extension of farms through bank credit for a new profitable venture). Likewise, when counterparts are family members (close friends) there is no need for complex contracts since relations are easily “governed” by the good will and mutual interests of parties.

Finally, the choice of governing mode depends on *transaction costs*. Governance is usually associated with significant costs for protection, contracting and exchange of individual rights. For example, farmers have costs for finding best prices and partners; negotiating conditions of exchange; contract writing and registration; enforcing negotiated terms through monitoring, controlling, measuring and safeguarding; disputing through a court system or another way; adjusting or termination along with evolving conditions of exchange etc.

Therefore, rational agents will seek, chose, and develop such modes for governing their activity and exchanges which maximize transacting benefits and minimize transaction costs. Moreover, both (*current*) *transaction costs* for using governing forms and *long-term transaction costs* for development (initiation, modernization, liquidation) of governance mode are taken into account.

If transaction costs were zero then the mode of the governance would not be of economic importance [Williamson]. In such a world individuals would manage their relations with an equal efficiency though free market, or through private organizations of different types, or in a single nationwide company. All information for the effective potential of transactions (exploration of technological opportunities, satisfying various demands, respecting assigned and transferred rights) would be costlessly available. And the individuals would costlessly define new rights, and protect their (absolute and contracted) rights, and trade owned resources (and products) in mutual benefit until exhausting the possibilities for increasing productivity (situation known as “Pareto optimum/efficiency”).

Thus the type of governance becomes crucial since various modes give unequal possibilities for participants to coordinate activities, and stimulate an acceptable behavior of others (counterparts, dependents), and protect their contracted and absolute rights from unwanted expropriation. Nevertheless, often the high costs make it difficult or block otherwise efficient (mutually beneficial) transactions. For instance, despite the great pay-off of investments in agrarian research and innovation, market and private agents do not organize such activity because of their high uncertainty and low market and private appropriability [Bachev and Labonne]. There is a strong need for a “third-party” (Government, NGOs, international assistance etc.) intervention in order to make such activity more effective or possible at all.

If there is a market and private sector failure but an effective government intervention is not introduced in a due time the agrarian “development” is substantially deformed (Government failure is possible). In Bulgaria for instance, there has been a great number of bad examples for Government under- and over-interventions in agrarian sector. Consequently, primitive and uncompetitive small-scale farming; predominance of over-integrated and personalized exchanges; ineffective and corrupted agrarian bureaucracy; blocking out of all class of agrarian transactions (such as innovation and extension supply, long-term credit supply, supply of infrastructure and environmental goods); and development of large informal (gray) sector, all they have come out as a result [Bachev, 2007].

In the long term only effective governing structures *for the specific economic, institutional and natural environment and personal characteristics of agents* will dominate in agriculture [Bachev 2004]. Thus there will be no single (universal) mode for effective organization of all type of agrarian activity and exchange in any possible natural, institutional, and economic surroundings. In any particular moment of time agrarian activities will be carried out (governed) through a great variety of modes: some will be governed by “invisible hand of market”, other will be carried out through a special contract mode, some will be managed within hierarchy, some will be supported by a third party, some would require more complicated and mixed modes.

4. Effective forms for contractual choice

In addition to production costs, the agrarian agents make significant transaction costs for governing relations with other agents - individuals, private entities, public authorities⁴.

The institutional environment considerably affects the level of transaction costs of individual agents. For instance, when private rights are well defined and protected, and (public) system for contract enforcement work well - that facilitates transactions between individuals and the effective allocation of resources. (Development of) institutional environment also imposes significant transaction costs to agents – e.g. for studying out and complying with various institutional restrictions (community or state norms, regulations, standards), formal registration of contracts and entities, efforts to deal with

⁴ Production costs are the cost associated with proper technology (“combination of production factors”) of certain farming, servicing, environmental, community development etc. activity. The transaction costs are the costs for governing the economic and other relations between individuals.

bureaucracy etc. A good example in this respect are current problems of many Bulgarian farms to meet the new EU requirements (“institutionally determined” costs) related to new product quality, food safety, labor, environmental, animal welfare etc. standards [Bachev, 2008]. Furthermore, EC is increasingly criticized for imposing unnecessary regulations (and related costs for agrarian agents) for the size, shape and color of vegetables and fruits for trade in EU etc.

Transaction costs have two *behavioral origins*: individual’s *bounded rationality* and *tendency for opportunism* [Williamson]. Economic agents do not possess full information about the system (price ranges, trade opportunities, adverse effects of their activities on others, trends in development) since the collection and processing of such information would be either very expensive or impossible (e.g. for future events, for partners intention for cheating, time and space discrepancy between individual action and adverse impacts on others etc.). In order to optimize decision-making agents have to spent costs for "increasing their imperfect rationality" - for data collection, analysis, forecasting, training etc.

Individuals are also given to opportunism in two major forms: *pre-contractual* ("adverse selection") - when some party uses "information asymmetry" to negotiate better contract terms; and *post-contractual* ("moral hazard") - when some counterpart takes an advantage of impossibility for full observation on his activities (by another partner or by a third party) or when he takes "legal advantages" of unpredicted changes in transacting conditions (costs, prices, environment etc.).

A special *third form* of opportunism occurs in the development of large organizations (known as “free-riding”). Since the individual benefits are often not proportional to the individual efforts, everybody tends to expect others to invest costs for the organizational development and later on to benefit from the successful new organization [Olson].

Commonly, it is very costly or impossible to distinguish the opportunistic from non-opportunistic behavior (because of the bounded rationality). Therefore, agrarian agents have to protect their transactions and rights from the hazard of opportunism through: ex ante efforts to protect their “absolute” (given by dominating institutions) rights, and find a reliable counterpart and to design an efficient mode for partners credible commitments to “contracted” (voluntary transferred) rights; and ex post investments for overcoming (through monitoring, controlling, stimulating cooperation) of possible opportunism during contract execution stage.

Technological development also affects enormously the structure and level of transaction costs [North]. For instance, mechanization and standardization of farming operations (products) increases bounded rationality of farm manager, and diminishes possibility for opportunism of hired labor and counterparts. That leads to the extension of activities and transactions under a single management (the farm size) – enlargement of internal transactions (internal division and specialization of labor) as well as outside market and/or contract transacting (procurement, trade, cooperation etc.).

Possibilities that progression and application of modern production (e.g. precision farming), transportation, measurement, information, communication etc. technologies gives to coordinate and intensify transactions and minimize related costs are immense - easy assessment and traceability; on line information, coordination, monitoring, detecting, advise; direct low costs exchanges (expressing demands, finding best prices

and partners, negotiating, trading, disputing) and collective actions (coalitions) of interested agents at national and international scales; rapid detection of problems and interventions by the governments and international agencies; full participation of individuals in and control on public decision-making etc.

However, that enormous potential for increasing productivity, effective allocation of resources, conservation of environment etc. meets the restrictions of imperfect institutional arrangements which eventually slow-sown scientific and technological progress, impede individual market and private transactions, allow particular agents (bureaucrats, interest groups) to benefits from the status-quos, and lead to unsustainable “development”. It is widely recognized that constant “food crisis” has been a consequence not of the lack of sufficient (world) technologies and resources for food production but the bad governance - inefficient Governments, inefficient international organizations, and inefficient global governance.

One direction for evaluation of efficiency of alternative contractual arrangement is the direct comparison of costs for each transaction in different forms. Organization which requires fewer costs is more efficient – e.g. it is more economical to use a marketing cooperative instead of own direct marketing of farm output.

Part of the transaction costs can be easily specified – costs for management, licensing and registration, agro-market information, promotion and marketing of output, general management, hiring lawyers and court suits, guarding property and yields, payment of bribes etc.

However, a significant portion of transaction costs is either very difficult (too expensive) or impossible to be assessed. In that group we can include the costs for finding best partners, negotiation, controlling and enforcement of contractual terms, organizational development, interlinked transacting, unrealized (failed) deals etc. Besides, it is often extremely complicated to separate transaction costs from traditional production expenditures⁵. For example, while executing farming operations a farmer supervises hired labor; during transportation of chemicals he negotiates marketing of output etc.

Component comparison of transacting costs could not always give an idea for efficiency of organizations. Very often the alternative form decreases one type of costs while increasing another type transacting costs – e.g. internalization of a transaction (replacement of market with integral mode) is associated with reduction of costs for information supply (overcoming market uncertainty), permanent (re)negotiations along with constantly changing conditions, safeguarding investments from outside opportunism. On the other hand, it enlarges costs for organizational formation, decision making, integral management, supervising and motivation of hired labor etc. In above example with alternatives for marketing of farm output the “internal realization” (personal consumption, production “consumption”, processing) could be chosen as more efficient form to direct sell or use of marketing cooperative.

Often it is difficult to select a base for comparison in view that the high transacting costs entirely block development of an alternative organization. For instance, market for agrarian credit did not emerged in Bulgaria during most of the transition and the internal supply (utilization of own finance, direct outside co-investment) was the only possible

⁵ All these “*measurement problems*” make it impossible to extend the traditional Neoclassical models simply by adding a new “transacting” activity [Furuboth and Richter].

form for finance supply of farms [Bachev, 2006]. Here the comparative level of transaction costs is impossible to be determined and appreciate the “high” efficiency of integral mode for financing. In that case funding with “own means” and with “bank credit” are not real alternative but completely different governing arrangements.

Finally, a good part of transactions in agriculture is governed not by “pure” but through complex, interlinked and/or supplementary modes - e.g. inputs supply in a “package” with know-how, credit, and/or service supply; crediting of production against marketing of output; governing of critical activities within own farm and membership cooperative etc. Thus, it is important to take into consideration the *overall (total) costs for organization of transactions of different types - all external and internal transaction costs of the farm*.

Another direction for evaluation of comparative efficiency of alternative governing forms is the *Discrete structural analysis* [Williamson]. Here the assessment of absolute levels of transaction costs of alternative governing structures is not necessary. This approach aims to evaluate the relative levels of transacting costs between alternative modes of governance, and selecting that one which most economizes on transacting costs. Actually, farm managers are interested not in absolute level of transaction costs in different form, but in organization with the lowest comparative costs for a particular transaction.

First the “*critical dimensions*” of transactions, responsible for the variation of transaction costs, are to be identified. “Frequency”, “uncertainty”, and “asset specificity” have been identified as critical factors of the transaction costs by Williamson [Williamson] while the “appropriability” has been added by Bachev and Labonne [Bachev and Labonne].

When the *recurrence* of transactions between the same partners is high, then both (all) sides are interested in sustaining and minimizing costs of their relations (avoiding opportunism, building reputation, setting up adjustment mechanisms etc.). Besides, the costs for development of a special private mode for facilitating bilateral (or multilateral) exchange could be effectively recovered by frequent exchange.

When the *uncertainty*, which surrounds transactions increases, then costs for carrying out and secure the transactions go up (for overcoming information deficiency, safeguarding against risk etc.). Certain risks could be diminished or eliminated by a production management or through a special market mode (e.g. purchase of insurance). However, the governance of most transacting risk would require a special private forms – e.g. trade with origins; providing guarantees; using share-rent or output-based compensation; employing economic hostages; participating in a risk-pooling, inputs-supply or marketing cooperative; a complete integration [Bachev and Nanseki].

The transaction costs get very high when *specific assets for the relations with a particular partner* are to be deployed⁶. In this case it is impossible to change a partner of transaction (alternative use of assets) without a big loss in value of the specific capital. Relation specific (dependent) investments are “locked” in transactions with a particular buyer or seller (personality of partner matters), and cannot be recovered through a

⁶ Specificity is not a technological but *transacting* characteristic of assets. In one situation a particular capital (investment) could be highly *universal* (easy deployment to another internal usage or outside trade) while in others - highly *specific* (a big dependency from the relations with a certain counterpart (buyer, seller, coalition partner)).

"faceless" market trade. Costless redeployment (alternative use) of specific assets is not possible if transactions fail to occur, they are prematurely terminated, or less favorable terms are renegotiated (in contract renewal time and before the end of life-span of specific capital). Therefore, dependant investment (assets) have to be safeguarded by a special form such as long-term or tied-up contract, interlinks, hostage taking, joint investment, quasi or complete (ownership) integration. Often, the later is quite expensive, investment in specific capital are not made, and activity either can not take place or occurs without (or loss of) comparative advantages in respect of productivity

If *symmetrical* assets dependency (regime of bilateral trade) exists there are strong incentives in both parties to elaborate a special private mode of governance. However, when *unilateral* dependency exists then dependent side (facing mini or total monopoly) has to protect investments against possible opportunism (behavioral uncertainty) either through integrating transactions (unified organization, joint ownership, cooperative)⁷; or safeguarding them with interlinked contract, exchange of economic hostages, development of collective organization to outstand asymmetrical dependency (for price negotiation, lobbying for Government regulations) etc.

The transacting is particularly difficult when *appropriability* of rights on products, services or resources is low. "Natural" low appropriability has most of the agrarian intellectual products - agro-market information, agro-meteorological forecasts, new varieties and technologies, software etc. Besides, all products and activities with significant (positive or negative) externalities are to be included in this group. If the appropriability is low the possibility for unwanted (market or private) exchange is great, and the costs for protection (safeguard, detection of cheating, disputing) of private rights and investments extremely high. Agents would either over produce (negative externalities) or under organize such activity (positive externalities) unless they are governed by an efficient private or hybrid mode (cooperation, strategic alliances, long-term contract, trade secrets, or public order).

Second, we have to "align transactions (differing in their attributes) with the governance structures (differing in their costs and competence) in discriminating (mainly in transaction cost economizing) way" [Williamson]. According to the *combination* of the specific characteristics of each activity and transaction, there will be *different the most effective form* for governance o that particular activity (Figure 2).

⁷ When technological opportunities for economy on scale (scope) on specific assets can be achieved. Otherwise integration of transactions will be lost-making comparing to outside price (production costs) competition.

Figure 2: Effective modes for contractual arrangement in agriculture⁸

Generic modes	<i>Critical dimensions of transactions</i>								
	Appropriability								
	<i>High</i>								<i>Low</i>
	Assets Specificity								
	<i>Low</i>				<i>High</i>				
	Uncertainty								
	<i>Low</i>		<i>High</i>		<i>Low</i>		<i>High</i>		
	Frequency								
	<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>	
Free market	Y	Y							
Special contract form			Y			Y			
Internal organization					Y		Y		
Third-party involvement				⚠				⚠	
Public intervention									⚠

Y - the most effective mode; ⚠ - a necessity for a third party involvement

Agrarian transactions with a good appropriability, high certainty, and universal character of investments (the partner can be changed anytime without significant additional costs) could be effectively carried across free market through *spotlight* or *classical contracts*. Here the organization of transactions with a special form or within the farm (firm) would only bring extra costs without producing any transacting benefits.

Recurrent transactions with low assets specificity, and a high uncertainty and appropriability, could be effectively governed through a *special contract*. The *relational* ("neoclassical") *contract* is applied when detailed terms of transacting are not known at outset (a high uncertainty), and a framework (mutual expectations) rather than a specification of obligations is practiced. Partners (self)restrict from opportunism and are motivated to settle emerging difficulties and continue relations (situation of a frequent bilateral trade). Besides, no significant risk is involved since investments could be easily (costlessly) redeployed to another use or users (no assets dependency exist).

A special contract forms is also efficient for rare transactions with a low uncertainty, high specificity and appropriability. Dependent investment could be successfully safeguarded through contract provisions since it is easy to define and enforce relevant obligations of partners in all possible contingencies (no uncertainty surrounds

⁸ Differences in personal characteristics of agents are *disregarded*. Only *extreme levels* (high-low) of the critical factors are considered. In the real agrarian economy there is a big *variation* of critical dimensions, and thus of the effective governing forms (including mixed, hybrid, interlinked etc. governance).

transactions)⁹. Here the occasional character of transactions does not justify internalization within the farm (firm).

Transactions with a high frequency, uncertainty, assets specificity (dependency), and appropriability, have to be organized within the farm/firm (internal ownership mode). For instance, managerial and technological knowledge is quite specific to a farm, and its supply has to be always governed through a permanent labor contract and coupled with ownership rights [Bachev, 2004]. Capital investments in land are to be made on owned (or long-leased) rather than a seasonally rented land (high site and product specificity). All “critical” to the farm material assets will be internally organized - production of forage for animals; important machineries; water supply for the irrigated farming etc. While universal capital could be effectively financed by a market form (e.g. a bank credit), the highly specific investments can be only made through an internal funding (own funds, equity sell, joint venture).

If the specific and specialized capital cannot be effectively organized within the farm (economy of scale and scope explored, funding made)¹⁰, then an effective governing form outside farm-gates is to be used - group farming, joint ownership, interlinks, cooperative, lobbying for a public intervention.

When a strong assets (capacity, technology, time of delivery, site, branding) *inter-dependency* with an upstream or downstream partner exists, then it is not difficult to govern transactions through a contract mode (strong mutual interests for cooperation and restriction of opportunism). For instance, effective supply (procurement) contracts between farmers processors are widely used in dairy, meat, vine, organic industries (symmetrical dependency).

However, very often farmers face *unilateral dependency* and need an effective (ownership) organization to protect their interests. Transacting costs for initiation and maintaining of such “collective organization” is usually great (big number of coalition, different interests of members, opportunism of “free-riding” type) and it is either unsustainable or does not evolve at all. That creates serious problems for the efficiency (and sustainability) of individual farms - missing markets, monopoly or quasi-monopoly situation, impossibility to “induce” a public intervention etc.

Serious transacting problems arise when condition of assets specificity is combined with a high uncertainty, low frequency, and good appropriability. Here the elaboration of a special governing structure for a private transacting is not justified, specific investments are not made, and activity (restriction of activity) fails to occur at an effective scale (“market failure” and “contract failure”). Similar difficulties are also encountered for rare transacting associated with a high uncertainty and appropriability.

In all these cases, a third part (private agent, NGO, public authority) involvement in transactions is necessary (through assistance, arbitration, regulation) in order to make them more efficient or possible at all. Emergence and unprecedented development of organic farming, and systems of trade with origins and “fair-trade” are good examples in that respect. There is an increasing consumer’s demand (a price premium) for organic, original, and fair-trade products in many countries. Nevertheless their supply could not be

⁹ Practically it is difficult (costly) or impossible to write a complete contract for complex transaction [Williamson].

¹⁰ Integration of transactions would either increase management costs (needs to buy from or sell to a competitor) or it would be loss-making comparing to outside production costs (price) competition.

met unless effective *trilateral governance* (including an independent certification and control) has been put in place.

When appropriability associated with a transaction (activity) is low, there is no pure market mode to protect and carry out activity effectively. Nevertheless, respecting others rights (unwanted exchange avoided) or “granting out” additional rights to others (needed transactions carried) could be governed by a “good will” or charity actions of individuals, NGOs, government or international organizations.

For instance, a great number of voluntary environmental initiatives (agreements) have emerged driven by the competition in the food industries, farmers’ preferences for eco-production, and responds to the public pressure for a sound environmental management. Unprecedented development of “codes of behaviors”, eco-labeling and branding, environmental cooperatives, and “green alliances”, all they are good examples in that respect. Nevertheless, environmental standards are usually “process-based”, and “environmental audit” is not conducted by an independent party, which does not guarantee a “performance outcome”. Therefore, most of these initiatives are seeing as a tool for an external image manipulation. Recent huge food safety, animal safety, and eco-scandals have demonstrated that such private schemes could often fail (result of high bounded rationality and possibility for opportunism).

In any case, voluntary initiatives could hardly satisfy the entire social demand especially if they require significant costs. Some private modes could be employed if a high frequency (a pay-back on investment is possible) and a mutual assets dependency (thus an incentive to cooperate) exists. For example, inter-dependency between a dairy farm and a milk processor in a remote region (capacity and site dependency); or a bee keeper and a neighboring orchard farm (symmetric dependency between needs of flower and needs for pollination). In all these instances, unwritten accords, interlinking, bilateral or collective agreements, close-membership cooperatives, codes of professional behavior, alliances, internal organization etc. are used.

However, emerging of special (private) large-members organizations for dealing with low appropriability (and satisfying the entire “social” demand) would be very slow and expensive, and they unlikely be sustainable in a long run (“free riding” problem). Therefore, there is a strong need for a *third-party public* (Government, local authority, international assistance etc.) *intervention* in order to make such activity possible or more effective [Bachev, 2004].

For example, supply of environmental goods by farmers could hardly be governed through private contracts with individual consumers because of low appropriability, high uncertainty, and rare character of transacting (high costs for negotiating, contracting, charging all potential consumers, disputing). At the same time, the supply of additional environmental protection service is very costly (in terms of production and organization costs) and would unlikely be carried out on a voluntary basis. Besides, the financial compensation (price-premium) of farmers by willing consumers through a pure market mode is also ineffective due to the high information asymmetry, massive enforcement costs etc. A third-party mode with a direct public involvement would make that transaction effective: on behalf of the consumers the State agency negotiates with individual farmers a *public contract* for “environment conservation and improvement service”, coordinates activities of various agents (including a direct production

management), provides public payments for compensation of farmers, and controls implementation of negotiated terms.

5. Economic boundaries of farm and agrarian organizations

Analysis of efficiency and factors of agrarian contracts let better understand and determine the effective size (boundaries) of farms and other agrarian organizations for the specific institutional, economic and natural environment of a particular industry, country etc. In the traditional (Neoclassical) framework, the farm is presented as a “production structure” and analyses of efficiency are restricted to production costs (“factors productivity”, “optimization of technological factors according to marginal rule”). However, the traditional approach fails to explain: why there exist so many farms with different productivity of resources utilization¹¹, and why there is so big variety of agrarian organizations at all (one-person farms, group farms, cooperatives and firms of different kind, subsistent farms, small and large farms etc.

The modern approach studies farm and other agrarian organizations as a *governance structures* which efficiency depends not only on their capacity to minimize on production costs, but also to economize on transaction costs [Bachev, 2004].

In a *one-person subsistent farm* there are no transaction costs (one agent), but limited possibility for extension of farm size through investment in specialized (and specific) human, material and natural capital, expansion of consumption etc. “Internal” opportunities for increasing productivity (through division of labor, investments, exploring economy of scale and size, new demand) augments along increasing the members of coalition (family or group farm, partnership) and/or outside trade of resources and products. The later is associated with additional transaction costs for making the coalition (finding complementary and reliable partners), increased internal costs for management (coordination, reducing bounded rationality, controlling opportunism of coalition members), and for outside market or contract trade (employment of labor; land and inputs supply; financing, marketing of output).

Thus the effective boundaries of farms will be determined by *the trade-off* between the additional *gain in benefits* (productivity, consumption etc.) and the *transaction costs*.

Furthermore, the high costs of outside exchange make it more profitable to carry out division and cooperation of labor (a transaction) within an organization (firm, group farm) instead across the market¹². For instance, a specialized livestock farm organizes internally a crop (forage) production activity (hiring additional labor and farmland) because of the significant costs and risks for market procurement of forage.

Nevertheless, the internal management of transactions is also associated with costs (for directing, stimulating and supervising hired labor; coordination and controlling activity of partners) which restricts unlimited expansion of borders of an organization¹³.

¹¹ For instance, production costs productivity of Bulgarian cooperatives has been 5 times lower than in private farms [Bachev, 2006].

¹² Fundamental “discovery” that “there are costs of using the price mechanism” [Coase, 1937] explained why production can not be carried out without any organization and why there are organizations of different type and size in agriculture.

¹³ Otherwise all agricultural production could be effectively carried on by one big company.

Thus a transaction will be carried in an organization if the costs are lower than for governing that transaction across market or in another organization [Coase, 1937]. Accordingly *a farm becomes bigger if integrates the governance of more internal and outside transactions*. Similarly, the farm becomes smaller if ceases previously organized transaction(s) and let them to market or another organization(s).

Moreover, the effective size and economic boundaries of farm will be determined through *optimization of total benefits and minimization of the total (production and transaction) costs* [Bachev, 2004]. Consequently, the distribution of overall (agrarian) activities between different farms and agrarian organizations will be determined by the *comparative costs (efficiency)* for using various governing arrangements.

Transacting modes and acceptable *net benefits* vary according to individual's preferences, entrepreneurship ability, risk aversion, opportunity costs of owned resources etc. Depending on the personality of resource owners and the (transacting) costs and benefits of their coalition, different type of farm will be preferred - *one-person farm* (firm), *family farm* (firm), *group farm* or *partnership* (firm), *cooperative* farm, and *corporative* farms [Bachev, 2004]. *Expected benefits for farmers* could range from the monetary or non-monetary income; profit; indirect revenue; pleasure of self-employment or family enterprise; enjoyment in agricultural activities; desire for involvement in environment, biodiversity, or cultural heritage preservation; increased leisure and free time; to other non-economic benefits¹⁴.

In the specific economic, institutional and natural environment (socio-economic development, legal framework, support policies, tradition, access to new technology, level of transacting costs) various types of farm will have quite different effective *horizontal and vertical boundaries*. For instance, in *transitional* conditions of high market and institutional uncertainty, and inefficient property rights and contract enforcement system, most agrarian investments happened to be in a regime of high specificity (dependency). As a result (over)integrated modes such as low productive subsistent household and group farming, or large production cooperatives and agro-companies, have been dominating in most East-European countries. Alternatively, in more matured economies, where markets are developed and institutions stable, the agrarian assets (activity) are with more universal character. Therefore, farm borders are greatly determined by the family borders, and more market and mixed (contract rather than entirely integrated) forms prevail.

Transaction costs minimizing helps us understand the reason of emergence and the efficiency of a great variety of agrarian organizations in the modern world – economic boundaries of farms (“make of buy decision”; extend of internal division and specialization, and product diversification), divers contractual arrangements and type of coalitions (partnerships, firms, cooperatives), economic needs for cooperation with competitors (inputs supply, marketing, lobbying etc. associations) or vertical (downstream, upstream) counterparts, joint ventures, pace and limits of development of agrarian markets etc. What is more, efficiency of a particular organization can hardly be assessed without analyzing the efficiency of *complementary* and/or *competing* organization(s). For instance, “high” efficiency of small-scale farms and the producers

¹⁴ A “desire for preservation of farm for future generation” has been a major reason for the persistence (sustainability) of a great number of part-time farms in Japan

(inputs supply, marketing) organizations in most countries can not be properly evaluated without analyzing their high complementarities¹⁵.

In order to assess the farm's efficiency we have to put *individual* transaction in the *centre of analysis*, and assess the level of associated costs and benefits. Major types of transactions of a farm entrepreneur are associated with:

- *management supply*,
- *know-how supply*,
- *innovation supply*,
- *supply of land and other natural resources*,
- *labor supply*,
- *inputs supply*,
- *service supply*,
- *finance supply*,
- *insurance supply*,
- *marketing of services and products*.

Next, we need to *identify* alternative forms for organization of different farm transactions in the specific market, institutional and natural environment, and *assess* their comparative efficiency. For illustration, the principle modes for governing of transactions in major functional areas of Bulgarian farms are presented in Figure 3.

Comparative efficiency is assessed for the condition of *each farm* as contractual (governance) form providing biggest *net* benefits is selected. For instance, in order to explore technological economies of scale a farmer is considering an expansion through application of modern machineries and leasing cheaply available farmland (Figure 4). Three contractual forms for securing needed machineries are feasible¹⁶ – a partnership with another farmer, buying mechanization service from a specialized market provider, and a purchase of necessary machineries. While alternative forms for machinery supply (inputs and services) are associated with the same additional transaction costs, the later mode gives biggest additional benefit in terms of growth in productivity and additional income. Nevertheless, the considerable transaction costs for outside funding (securing a bank loan) make it impossible (inefficient) to select the third form otherwise allowing maximum productivity (and farm expansion).

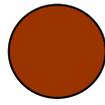
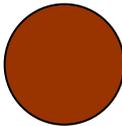
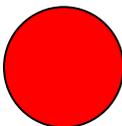
¹⁵ E.g. the high efficiency and sustainability of small scale subsistence and semi-market farms, and production cooperatives in transitional Bulgarian agriculture [Bachev, 2006].

¹⁶ transaction costs for supply of additional farmland could be ignored because they are insignificant.

Figure 3: Principle contract forms for functional areas of Bulgarian farms

Functional areas	Alternative contractual modes		
	<i>Market contract</i>	<i>Special contract</i>	<i>Special organization</i>
Supply of management	na	Employment contract with guaranteed minimum salary and output-based bonuses	Cooperation Partnership
Supply of land and other natural resources	Purchase Short-term lease	Long-term lease with a fix rent Long-term lease with a share rent Long-term lease with a market rent	Cooperation Partnership
Labor supply	Daily hire Seasonal hire	Permanent labor contract with a fix remuneration Permanent labor contract with result based payment	Partnership Cooperation
Supply of short-term material assets	Purchase with a spotlight contract Standard contract	Long-term procurement contract Supply contract interlinked with a credit supply, service supply, and/or marketing of farm produce	Cooperation
Supply of long-term material assets	Purchase with a spotlight contract Standard contract	Long-term lease contract Contract for purchase interlinked with crediting (leasing) and/or services	Partnership Cooperation
Service supply	Purchase with a spotlight contract Standard contract	Long-term supply contract Supply contract interlinked with other services, products or crediting	Partnership Cooperation
Innovation and know-how supply	Purchase with spotlight contract Standard contract Free consultation in the farm advisory system	Long-term supply contract Supply contract interlinked with supply of material assets and/or crediting	Cooperation
Financing	Bank loan Loan from an individual agent Loan from a private organization	Co-investment Crediting interlinked with supply of material assets and services Contract with a public funding program	Partnership Cooperation
Insurance	Purchase of insurance Purchase of “assurance service”	Insurance contract interlinked with material assets Long-term insurance contract	Cooperation
Marketing of products and services	Retail sale Wholesale trade Standard contract	Long-term contract for marketing Marketing contract interlinked with crediting, supply of material assets and/or services	Partnership Cooperation

Figure 4: Assessment of alternative contract forms for farm expansion

Criteria	Alternative contract forms		
	Partnership	Service contract	Purchase of machinery
1. Additional benefit (growth in productivity and income)		< 	< 
2. Additional transaction costs			
- for inputs and service supply		= 	= 
- for financing		= 	< 
3. Net benefits	negative	positive	negative
Most effective form			

Generally, the contract with the highest transaction costs (for credit supply in the above example) eventually determines (*limit*) the farm boundaries. A major factor restricting farm extension, which is generally identified around the world, is the enormous costs for enforcement (monitoring, measuring, controlling) of non-family labor contracts [Hayami and Otsuka]. That is why an owner-operated farm is the most common form for farm organization around the world. On the other hand, enormous “credit supply” and “marketing” costs were specified as the critical factors limiting farm enlargement in the transitional Bulgarian agriculture [Bachev and Kagatsume]. Subsequently, despite favorable natural environment, cheap labor and farmland, good tradition, and growing market demand, a great part of overall farming activity has been carried out in numerous small, semi-market and subsistence farms with primitive technology, productivity and eco-standards.

Finally, we can use our new framework to define the *sustainability* of different farms and agrarian organizations. A farm will be *sustainable* if it manages all transactions in the most economical for the owner(s) way – that is the situation when there exist no activity which could be carried out with a net benefit [Bachev and Peeters]. If a farm does not govern activity or transactions effectively, it will be unsustainable since it experiences high costs and difficulties using institutions (possibilities, restrictions) and carrying out activity (transactions) comparing to other feasible organization. In that case, there will be strong incentives for exploring the existing potential (*adapting to a sustainable state*) through reduction or enlargement of farm size, or via reorganization or liquidation of the farm. Thus either alternative farm or non-farm application of resources; or farm expansion through an employment of additional resources; or trade instead of

internal use of owned land and labor; or taking over by (or merger with) another farm or organization¹⁷, will take place.

Furhthermore, we have to estimate farm's *potential (incentives, ability) for adaptation* to evolving market, institutional and natural environment through effective changes in the *governing forms* (saving on transacting costs) and *production structure* (exploring technological possibilities for growth in productivity) [Bachev and Peeters]. Thus if a farm does not have a potential to *stay at* or *adapt to new* more sustainable level(s) it would be either liquidated or transformed into another type of farm. For instance, if a farm faces enormous difficulties meeting institutional opportunities and restrictions (e.g. new quality and environmental standards, production quotas); or has serious problems supplying managerial capital (as it is in a one-person farm when an aged farmer has no successor), or supply of needed farmland (a big demand for non-agricultural use of land), or funding activities (insufficient own finance, impossibility to sell equity or buy credit), or marketing output (a changing demand for certain products, strong competition with the imported products), then it would not be sustainable despite high historical or current efficiency. Currently there are numerous unsustainable farms in most EU countries, which can hardly adjust to fundamental changes in CAP, and associated enhanced competition and new safety, environmental, animal welfare etc. standards.

Conclusion

Suggested framework let better understand and assess diverse contractual arrangements is modern agriculture. It could help identify driving factors (logic) and potential efficiency (limits) of various modes of governance in agriculture. However, it does not have only academic importance. It could assist agrarian agents in effective contract and organizational design for the specific market, institutional and natural environment of their activity and relations. What is more, it could significantly support improvement of public (government, international assistance etc.) policies and forms of intervention in agrarian sector.

¹⁷ In most developed countries, the sustainable development has been associated with *disappearance* of traditional farming organization in major sectors (poultry, beef, pig) which is *taken over* by or *integrated* into related industries [Martinez].

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