Framework for assessing efficiency of farms and agrarian organizations

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Abstract

Broadly applied traditional frameworks for assessing efficiency of economic organizations in agriculture are (only) based on the "technical efficiency" of the factors of production and the "productivity of employed resources". They compare the levels of efficiency of farms of different types, sectors, and countries without taking into account the transaction costs and the specific economic, institutional and natural environment of their development. At the same time, other agrarian organizations (contracts, associations, markets, public and hybrid forms) are not considered as alternative economic structures and are either ignored or studies separately.

This paper suggests a new approach for assessing efficiency of economic organizations and public intervention in agriculture incorporating achievements of the interdisciplinary New Institutional Economics. Presented new approach includes: studying out the farm and agrarian organizations as a governing rather than a production structure; assessment of the comparative efficiency of alternative market, contract, internal, and hybrid modes of governance on the base of their potential to minimise production and transaction costs and to maximise the production and transaction benefits; analysis of the level of transaction costs and their institutional (distribution of rights and obligations, and the systems of their enforcements), behavioural (preferences, bounded rationality and opportunism of individuals), dimensional (uncertainty, frequency, assets specificity and appropriability of activity/transactions), technological (non-separability, economies of scale and scope) and natural factors; and determination of adequate criteria of farm efficiency and its effective boundaries – the potential to increase productivity of resources with minimum transaction costs comparing to a practically possible alternative organisation.

The new approach is also used to precise the needs for public interventions ("the economic role of government") in agrarian sector and to assess the comparative efficiency of alternative forms of public involvement. The analysis of socio-economic and natural environment and the transaction costs identifies a multiple cases of "market and private failures" associated with non-identified or badly assigned property rights, ineffective system of enforcement of absolute and contracted rights, high uncertainty and dependency of activity, low appropriability, needs for collective actions etc. which necessitate a third-party public intervention in market and private sectors. The individual forms of public involvement (institutional modernisation, assistance, regulation, taxation, hybrid or internal organisation) are with unequal efficiency in the specific environment of different countries, regions, and sectors, and the most efficient one(s) is/are to be selected with taking into account the total (direct, private, public, transaction, third-party etc.) costs and the contribution to the sustainable development. Nevertheless, "the public failure" is feasible and bad interventions, delayed, under or over-regulations, miss-management, corruption etc. are widespread and as a result the sustainable development of the sector is compromised.

JEL Classifications: Q01, Q12, Q13, Q15, Q18
Keywords: efficiency of farms and agrarian organizations; market, private and public governance

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Introduction

Around the globe the issue of assessment of efficiency of farms and agrarian organizations is among the most topical in the discussions of researchers, farmers, investors, politicians, and the public at large[2].

Unprecedented development in the theory of economic organisations in the past decades has brought about to a significant evolution in understanding of essence and efficiency of agrarian organisations as well[3]. Despite that specific and partial approaches for assessing the efficiency of farms and other economic organisations in agriculture are predominately used. Efficiency of agrarian organizations is usually evaluated (only) through „technical efficiency" of production factors and "productivity of employed resources". Comparisons are made of levels of efficiency across farms of different type, sectors and countries independent to the specific economic, institutional or natural environment of their development. Not corresponding to the real world „ideal" models and sizes of "effective" (livestock, greenhouse) enterprises are recommended based on optimization of technological factors of production and/or experiences in other regions and countries. On the other hand, the other agrarian organizations (contracts, associations, markets, public forms) are not considered as alternative structures but are ignored or studied separately.

In more sophisticated models of the Neoclassical Economics the criteria for assessing efficiency of an organization is derived from the equilibrium condition of the entire economic system – when marginal income is equalized with the marginal costs[4]. According to such simplified understanding of the economy the entire activity of agents is governed by a single free market mode. Organizations using resources with different (higher, lower) from marginal productivity are inefficient. The rare cases of „market failure" (tragedy of commons, externalities) are easily detected and timely corrected though „perfect" government intervention.

Traditional approach for assessing economic organizations can not give answer to the question: *why there exist so many organizations performing with a great variation in efficiency* for a long period of time. For instance, all analysis show a high sustainability of "inefficient" organizations in Bulgarian agriculture - unproductive (semi)market farms, production cooperatives with profitability several times lower than private farms, sub-sectors with "return on resources" bellow the agricultural average, inefficient contractual and vertically integrated arrangements, not-working public organizations[5]. If efficiency of a particular organisation is low there will be always a strong private or public mechanism (competition, public intervention) for reallocation of resources to more effective application, and in the long run there will exist only

[2] Gortova M. and S.Davidova (2003). Farm productivity and efficiency in the CEE applicant countries, Elsevier; Harvey J., Klein P. and M.Sykuta (2007). Markets, Contracts, or Integration? CORI; Mathijs E. and J. Swinnen (1997). Production Organization and Efficiency during Transition, PRG; Masterson T. (2007). Productivity, Technical Efficiency, and Farm Size in Paraguayan Agriculture, Levy Economics Institute; Sporleder T. (1992). Managerial Economics of Vertically Coordinated Agricultural Firms, Amer. J. Agric. Economics, 5, 1226-1231.

[3] Bachev, H. (2004). Efficiency of Agrarian Organizations, Farm Management and Rural Planning. 5, 135-150; Harvey J. and M. Sykuta (2005). Property Right and Organizational Characteristics of Producer-Owned Firms, Annals of Public and Cooperative Economics, 4, 545-580.

[4] Pigou A. (1920). Economics of Welfare. London: Macmillan and Co.

[5] Иванова Н. (2009). Икономическа ефективност на българските земеделски стопанства, специализирани в производството на зърно, грозде и зеленчуци, Икономика и управление на селското стопанство, 2, 51-61; Котева Н. (2011) Икономическа ефективност на земеделските стопанства, Икономика и управление на селското стопанство, 1; Bachev H. (2010). Management of Farm Contracts and Competitiveness, VDM Verlag.

"effective" organizations governing resources on (close to) socially acceptable level of efficiency.

The traditional approach estimates and compare levels of efficiency of different organisations without even looking for answering the question: *why there exist so big variety of organizations* in a country, sub-sector of agriculture, geographical region etc. - one-person farms, group farms, registered cooperatives and firms of different kind, associations and joint ventures, subsistent farms, part-time and full-time farms, small and large farms, contractually or fully-integrated forms, hybrid (public-private) organisations. Therefore, in the narrow framework of approach restricting efficiency of economic organisations to production costs, it is neither possible to understand the economic logic of diverse agrarian organisation nor to assess their comparative efficiency and complementarities.

This paper incorporates achievements of the New Institutional Economics[6] *and suggests adequate framework for assessing the efficiency of farms and diverse economic organizations in agriculture.* The goal is to understand the role, factors, and efficiency of agrarian organisations, as well as to assist organisational design of farms, collective actions of agrarian agents, and public policy in the sector.

Agrarian organizations as a governance structure

Newly developing methodology of the *New Institutional Economics* explains existence of diverse economic organizations with their role to *govern relations between individual agents and minimize on transaction costs*. Carrying out agricultural activity and related exchange (land and labor supply, financing, marketing of output) is usually associated with significant (transaction) costs. For instance, there are costs for complying with institutional requirements (laws, standards, informal norms), finding best prices and partners; negotiating conditions of exchange; contract writing and registration; enforcing negotiated terms; dispute resolution (including though court or another way); adjusting or termination along with evolving conditions etc.

Division and specialization of labor, and related exchange and cooperation, open up enormous opportunities for increasing productivity and welfare. They create possibilities and incentives for deepening specialization and exchanges. However, they are also associated with additional transaction costs. The high costs of outside exchange make it more profitable to carry out division and cooperation of labor (a transaction) within a certain organization (firm, group farm) instead across the market. For instance, a specialized livestock farm organizes internally a crop production activity (hiring additional labor, farmland) because of significant costs and risks for market procurement of forage. Internal management of transactions is also associated with costs (for directing, stimulating and supervising hired labor; coordination and controlling partners activity) which restricts unlimited expansion of borders of (internal) organization. Thus *a transaction (activity) will be carried in an organization if the costs are lower than for governing that transaction across market or in another organization*[7].

Usually, every agrarian activity and exchange could be governed through a great variety of *alterative* forms[8]. One extreme for the farm manager is to specialize exclusively in governing of

[6] Coase R. (1937). The Nature of the Firm, Economica 4, 386-405; Furuboth E. and R. Richter (1998). Institutions and Economic Theory: The Contribution of the New Institutional Economics. Ann Arbor: The University of Michigan Press; Williamson O. (1996). The Mechanisms of Governance. New York: Oxford University Press.

[7] Coase R. (1937). The Nature of the Firm, Economica 4, 386-405.

[8] In agriculture it is almost impossible to give examples where the organizational form is unilaterally

market transactions (rather than production management) - 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 one-person or group farm – the farmer(s) employ only own resources and labor, and consume the entire product. Between these two polls there is a spectrum of feasible modes for governing of agrarian activity and exchange. For instance, "cultivation of land by a tractor" can be governed in numerous ways: the farmer can buy (unified ownership), rent (rent contract) or lease a tractor (input and credit supply interlinked contract), and use it for cultivation of land; the farmer could buy once or multiple times cultivation service from market (spot-light of long-term service contract); a number of farmers may buy jointly a tractor (joint ownership) and use it in a group (producers cooperative) or individually; the farmer can join a cooperative providing cultivation services (non for profit organization); the farmer may lease the land out to a tractor owner and share the output (tenancy contract with fix or share rent); the farmer can hire a tractorist to work on farm (employment contract), and may even sell out the cultivation service (profit making organization); the cultivation services to farms could be subsidized by the Government (trilateral mode), or provided by a municipality or a state company (public organization) etc. Depending on comparative efficiency of practically possible forms preference will be given to one or another organisation of activity/exchange.

Consequently, distribution of overall activities between different farms, agrarian organizations, and markets will be determined by comparative costs for using various governing arrangements as *the most efficient one(s) minimizing the total (internal and external) transaction cost will prevail* in the long run. The economic efficiency of farms and agrarian organizations should take into account not only their capacity to minimize production costs, but also ability to economize on transaction costs. While the production costs are cost associated with proper technology ("combination of production factors") of certain farming, eco-conservation etc. activity, the transaction costs are costs for governing relations between individuals (for adaptation to institutional restrictions, coordination of activity, protection and exchange of various rights etc.). Moreover, both *(current)* costs for using individual organizations and *long-term* costs for their development (initiation, maintenance, modernization, liquidation) have to be taken into account.

If the execution of activity and exchange was not associated with transaction costs ("zero transaction costs") then the mode of organization would have no economic importance[9]. The individuals would govern their relationships with same efficiency though free market (adapting to price movements), and private modes of different types (contracts, firms), and collective decision-making (cooperative, association), and a nationwide hierarchy (single private/state company). Then the technological opportunities for economies of scale and scope for production of socially needed products and services (maximum productivity of resources, "internalization of externalities") would be easily achieved[10]. All information for the effective potential of transactions (optimization of resources, meeting demands, respecting rights and rules) would be costlessly available to everybody, and individuals would costlessly define new rights, and protect

(pre)determined by technology, and with the same production technology are possible many forms of organizations.

[9] Williamson O. (1996). The Mechanisms of Governance. New York: Oxford University Press.

[10] Coase R. (1960). The Problem of Social Costs, Journal of Law and Economics 3, 1-44.

absolute[11] and contracted rights, and trade (exchange) owned resources in mutual benefit until exhausting possibilities for increasing productivity and welfare ("Pareto efficiency").

However, often the high transaction costs make it difficult or even block otherwise efficient (mutually beneficial) for all parties activity and exchange. For instance, despite the high pay-off of investments in agrarian research and innovation, the market and private agents do not organize (at all, socially desirable scale) such activity/transactions because of the high uncertainty and low (market and private) appropriability of investment.

Since carrying out agrarian activity is connected with transaction costs, the "rational" agents will seek, chose, and develop such modes for organization of activity and exchanges which *maximize transacting benefits* and *minimize transaction costs*. The type of economic organization is crucial since various governing modes give unequal possibilities for participants to explore social and technological opportunities (meeting demands, economies of scale and scope, non-separability of activity), coordinate and adapt transactions, stimulate acceptable behaviour of counterparts, control and protect from unwanted expropriation investments etc. In the long-run inefficient forms will be abandoned and only effective modes for organization of agrarian activity and exchange will dominate.

Each activity and transaction has different specific characteristics varying according to the institutional environment (legislation, efficiency of public enforcement of laws and private contract, other formal and informal restrictions), personal characteristics of agents (preferences, accumulated experience, established reputation, tendency for opportunistic behavior, risk aversion), macroeconomic conditions (economic stability, foreign trade regime, available state support), dominant technologies (mechanization and standardization of operations, application of information technologies), and natural environment (recourses endowment, dependency). There exist no singe most efficient form for organization of all agrarian activity and transactions in all practically possible economic, institutional and natural settings. According to the critical dimensions of activity/exchange the agrarian agents will use the most appropriate (effective) mode for governance. In any particular moment the entire agrarian activity and allocation of resources will be carried out (governed) through a *great variety* of economic organizations: part of it will be within a classical one-person farm (firm), another part will be managed though a special contract modes ("private order") between independent partners, the third part be coordinated by the movement of market prices and market competition ('invisible market hand"), part will be organized though collective decision-making (partnership, cooperative), another part will ne will be managed internally by a manager or more complex hierarchical structures, some will be supported by a third party (Government, international assistance), or would require more complicated and hybrid modes.

Transaction costs minimizing "logic" helps us understand the evolution and efficiency of modern agrarian organizations – the dynamics in development and potential of diverse type of farms (subsistent, semi-market, group, for profit or non for profit orientation, corporate) and coalitions; economic horizontal and vertical boundaries of farms (extension of internal division and specialization of labor, product diversification, decisions to "make of buy", "sell or continue processing", "buy or rent", "organize production or transfer-out user rights on resources); divers kind of contracts (classical, neoclassical, trilateral, long-term, interlinked) for supply of land, labor, services, resources, innovation, finance, risk management, marketing; economic needs for

[11] Formal and informal rights of individuals, groups, and generations defined by the institutional environment.

cooperation with competitors (in inputs supply, marketing, environmental conservation, lobbying) or vertical (downstream, upstream) counterparts; forms of management of natural resources and eco-system services; pace and limits of development of agrarian and related markets; needs for and efficiency of state and/or international intervention etc[12].

What is more, efficiency of particular organization can hardly be assessed without analyzing efficiency of complementary and/or competing organization(s). For instance, "high" efficiency of small-scale farms and producers (inputs supply, marketing) organizations in most countries can not be properly evaluated without analyzing their high complementarities. Furthermore, depending on dominating public organizations (public provision, support, preferences), individual market and/or private organizations would have quite dissimilar efficiency for different agents.

What is more, efficiency of a particular organization can not be properly assessed without analyzing the efficiency of complementary and/or competitive organization/s. For instance, the "high" efficiency" of numerous small (and domestic) farms and production cooperatives during post-communist transition in Bulgaria can hardly be properly evaluated without analyzing their high complementarities[13].

According to the dominant institutional environment (distribution of formal and informal rights and obligations between individuals and groups, and efficiency of enforcement of "rules of the game") and the forms of public involvement (state provision, assistance regulation), the individual market and/or private organizations will be with quite dissimilar efficiency for different agents and sectors. For instance, in transitional conditions of not well-defined and assigned private rights on farmland, and the high costs for their protection and exchange, the short-term lease and the internal integration (subsistence and semi-market farming, production cooperation) were the most efficient forms for organization of land supply in Bulgarian agriculture. Therefore, specific institutional environment in which economic activity is carried out is the *key parameter*, which eventually (pre)determine the type and pace of socio-economic development of a particular social group, region, sector of economy, country etc[14].

Thus in the real world with incomplete and not-well defined and enforced rights, and positive transaction costs, the farm and other agrarian organizations have a *significant economic role.* Farms are not only production but a major governance structures – the forms for organization of transactions and for minimization of transaction costs. The efficiency of different type of farms can nit be properly understood and assessed without analyzing their comparative production **and** governance potential. It must be abandoned commonly used Nirvana approach for evaluating organizational forms as "good" or "bad" for their own, or on the basis of a specific (technical, distributional, financial, ecological) type efficiency, or in a comparison with some non-feasible (ideal, institutional and transaction costs free, in other countries etc.) model. The evaluation is to be directed to finding out the comparative advantages for initiating, establishing, using, management, adaptation, intensification, coordination, stimulation and controlling of the alternative and really possible modes of governance in the specific market, institutional, technological and natural environment.

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[12] Analysis of efficiency of agrarian organizations during transition and European integration in Bulgaria is done by Bachev H. (2010). Management of Farm Contracts and Competitiveness, Saarbrücken: VDM Verlag.

[13] Bachev H. (2010). Governance of Agrarian Sustainability, New York: Nova Science Publisher.

[14] North D. (1990). Institutions, Institutional Change and Economic Performance. Cambridge University Press.

Factors for choice of organizational form

Individual forms of governance have specific *advantages* and *disadvantages* for protection of rights of participants, and coordination and stimulation of socially needed agricultural activity (production of food and feed, materials for industry, environmental conservation etc.). They are alternative but not equally efficient modes for organization of individual activity/transactions since they have different features (advantages, disadvantages) to coordinate, control, and stimulate (maximize benefits from, minimize costs of) transactions.

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 high uncertainty, risk, and costs due to lack of adequate information, price instability, possibility for opportunistic behaviour, "missing market" situation etc.

The special contract form (private ordering) permits better coordination, intensification, and safeguard of activity/exchange. However, it may require large costs for specification, writing down and registration of contract provisions, controlling contract implementation, adjustments with constant changes in conditions, enforcement and disputing of negotiated terms etc.

The internal (ownership) organization allows greater flexibility and control on activity (direct coordination, adaptation, enforcement, dispute resolution by fiat). However, extension of internal mode beyond family and small-partnership boundaries command significant costs for coalition (finding partners, design, registration, restructuring), and current management (collective decision-making, control on coalition members opportunism, direction, supervision and motivation of hired labour). *The separation of the ownership from the management* (cooperative, corporation) 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 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 *the 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 (horizon problem).

Which one from the principle form of organisation of activity and transactions will be used depends on comparative efficiency (transaction costs) of practically possible alternatives. The transaction costs have two *behavioral* origins: *individual's bounded rationality* and *opportunism*[15]. Agrarian agents do not possess full information about the economic system (price ranges, demands, trade opportunities, development trends) since collection and processing of such information is very expensive or impossible (multiple markets, future events, partners intention for cheating). In order to optimize decision-making they have to spent costs for "increasing their imperfect rationality" - data collection, analysis, forecasting, training, consultation.

Economic agents are also given to opportunism and if there is an opportunity for some of transacting sides to get non-punishably extra benefit/rent from exchange he will likely to take an advantage of that. Three major forms of opportunism can be distinguished: *pre-contractual*

[15] Williamson O. (1981). The Economics of Organization. The American Journal of Sociology 87 (3), 548–577.

(adverse selection) - when some of the partners use the "information asymmetry" to negotiate better contract terms; *post-contractual* (moral hazard) - when some counterpart takes advantage of impossibility for full observation on his activities (by another partner, a third-party) or when he takes "legal advantages" of unpredicted changes in exchange conditions (costs, prices, formal regulations). The third form (free ride) occurs in development of large organizations where individual benefits are not-proportional to individual efforts (costs). The trend is everyone to expect others to invest in organizational development, and benefit from the new organization in case of a success[16].

It is often very costly or impossible to distinguish opportunistic from non-opportunistic behavior because of the bounded rationality of agents (e.g. farmer finds out that purchased seeds are not high quality only during harvesting time). Agrarian agents have to protect their rights, investments, and transactions from hazard of opportunism through: ex-ante efforts to find reliable counterpart and design efficient mode for partners credible commitments; and ex-post investments for overcoming (through monitoring, controlling, stimulating cooperation) of possible opportunism during contract execution stage[17].

Besides the transaction costs, the choice of economic organization also depends on a number of additional important factors: *First, personal characteristics of individual agents* – preferences, ideology, knowledge, capability, risk-aversion, reputation, trust, "contractual" power. For instance, farming organization is often restricted to a family partnership; in some cultures, the cooperative is the preferred mode of agrarian organization. If the farmer is a good manager he will design, control and run a bigger (more effective) organization adapted to his specific needs - manage effectively more internal (hired labor) and outside (market and contract) transactions. A risk-taking farmer prefers risky but more productive forms - e.g. bank credit for a new profitable venture. When counterparts are family members or close friends there is no need for complex organization since relations are "governed" by the high mutual confidence, good will, and common interests of parties. Benefits for farmers could take different forms: monetary or non-monetary income, profit, indirect revenue, pleasure of self-employment or family enterprise, enjoyment in agriculture, desire for involvement in environment or heritage preservation, increased leisure and free time, other non-economic benefits.

Second, institutional environment - formal and/or informally imposed social order ("rules of the game") and associated costs. Often the choice of governing mode is (pre)determined by the institutional restrictions as some forms for carrying farming activities, land and labor supply, trade of output etc. could be socially unacceptable, too expensive or illegal. For instance, corporate and cooperative organization of farming is forbidden in many countries; market trade of farmland, natural resources, and some products/resources is illegitimate, private management of natural ecosystems is not allowed; some type of farms, agrarian property or transactions are with preferential tax regime. However, if 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 economies are widespread around the globe.

The (external) institutional environment considerably affects the level of transaction costs and thus the choice of economic organization. For instance, in recent years thousands of

[16] Olson M. (1969). The Logic of Collective Actions: Public Goods and the Theory of Groups. Harvard Univ. Press.
[17] Williamson O. (1996). The Mechanisms of Governance. New York: Oxford University Press.

Bulgarian farms and organizations have been closed due to impossibility to adapt to new EU standards for quality, safety, environmental preservation, animal welfare etc. Principally, in conditions of stable and well-working public regulation (regulations, quality standards, price guarantees, quotas) and effective mechanisms for laws and contract enforcement, a preference is given to spotlight and classical/standard contracts. When rights on major agrarian resources (lands, waters, material assets) are not well defined, and absolute/contracted right effectively enforced, that lead to domination of primitive subsistence farming, personalized and over-integrated forms, unsustainable organizations, undeveloped and missing markets.

Third, natural and technological factors like non-separability and interdependency of activity, technological economies of size and scale etc. In rare cases there is *only one* practically possible form for governance of agrarian activity. For example, the natural minimal size of farming organisation is determined by a technological parameter such as non-separability of activity (e.g. biological non-separability of individual animal). In Japanese dispersed paddy agriculture water supply could not have been conducted by individual farmers (high interdependency, non-separability of water use) and since earliest period water use organization developed as a public project[18]. The effective governance of some environmental activities also requires a certain scale and thus collective actions at local, regional, national or transnational scale. However, beside these few examples, in farming is almost impossible to find cases where the form of governance is unilaterally determined by the technological parameters.

Another technological factor, which can determine the form of governance (type and size of the farm) is possibility to explore technological economies of size and scale. For instance, in order to use a large harvester-combine the farmer extend the farms size, or produces two or more products with different technologies in order to utilize "free" resources (family labor). Generally, development of technology follows the demand in the sector and in fact is also a variable parameter[19]. What is more, maximal scale economies could be achieved not through internalization of activity but though market exchange of specialized activity – e.g. selling out or purchasing a service "harvesting with a combine". Free resources of the farmer could also be traded (sold, leased-out) more effectively on market instead of being used in own non-specialized activity (opportunity costs rule).

Actually, we can observe the opposite tendency – dependence of technological development from the governance structure. It is typical when the institutional restrictions (land transfer, hiring labor) and the high transaction costs (for outside financing/crediting) restrict realization of the potential of available technologies. Widespread application of primitive technologies is a rule rather then exception in agrarian sector. In other instances, the high transaction uncertainty or imperfect institutional arrangements lead to expansion of farm organization beyond the "technologically optimal" scale. In East Europe has been common "over-concentration" during communist period, and "over-integration and cooperation" in the following transition afterword.

The ttechnological development affects enormously the structure and level of transaction costs. Mechanization and standardization of operations and products increases manageability and leads to extension of activities under a singe management enlarging internal (internal division and specialization of labor) and outside (market and contract procurement, trade, cooperation) transactions. Possibilities that progression of modern production, transportation, measurement,

[18] Mori T. (1991). The History of Japanese Agriculture, in Agricultural Policy in Japan, IAAE Conference, Tokyo.
[19] Otherwise it is very difficult to explain the wide spreading of "small" machineries in agriculture.

communication etc. technologies gives to coordinate and intensify transactions and minimize costs are immense - easy assessment and traceability; on line information, coordination, monitoring, detecting, advise; direct low costs exchanges and collective actions of interested agents at national and international scales; rapid detection of problems and interventions by the government; full participation of individuals in and control on public decision-making etc.

Criteria for the efficiency of farm

The better understanding of the essence of agrarian organizations let us resize the criteria for economic efficiency of the farms as well. The "immediate combination" of the factors of production in agriculture will have to be carried out in such forms which optimize (minimize) the total production and transaction costs of participants. One farm will be efficient if (has a potential to) realize *maximum possible productivity of resources with minimum transaction costs*. According to that an increase in efficiency of an enterprise means improving productivity with the same transaction costs or decreasing the transaction costs for achieving certain productivity. The (maximum) efficiency of the farm is achieved when the potential for increasing productivity of resources is realized with the minimum transaction costs comparing to practically possible alternative organization.

Often, the alternative organization of the farm (commercialization of internal transactions, transformation of one-person farm/firm into a coalition) is obviously more efficient since it increases the overall technological and transactional benefits with less overall costs (economies of scale and size). However, if changing the organization is associated with additional production benefits (reduction of production costs, growth in productivity and quality) at the expanse of additional transaction costs (management of a contract for finance supply, innovations and services, hiring labor), then the new organization will be efficient if there is a *net benefit – when benefits in the form of growth in output, income, free time etc. are bigger then the growth of transaction costs.*

Methods for assessing the partial and overall productivity of resources (productivity, profitability, measurement of current and capital costs etc.) are well elaborated. What is a challenge is the "measurement" of transaction costs. One direction for is the *direct* comparison of costs for each transaction in different forms as organization which requires less costs is more efficient. For instance, a comparison is made whether is more beneficial own marketing of output or it is cheaper to use a marketing cooperative.

Sometimes, the costs of transaction are easily determined since they are object of separate accountancy or can be easily specified. For instance, costs for registration, agro-market information, advertisement, court suits, guarding property, payment of bribes, (part of) losses from ineffective transactions (thefts, cheating, failed product) could be quite precisely specified.

However, a portion of transaction costs is difficult (very expensive) or impossible to be determined. In the late group are included the costs for finding best partner, negotiation, enforcement of contractual terms, organizational development, interlinked transacting, unrealized and failed deals. It is often complicated to separate transaction costs from the traditional production expenditures[20] – e.g. while executing farming operations a farmer supervises hired

[20] All these difficulties make it impossible to use various models of Neoclassical economics through simple adding a new "transaction activity".

labor; during inputs transportation he negotiates marketing of output. Approximate estimate for the level of transaction costs could be made by interviewing farm managers where they indicate the level (high, middle, low) of efforts/time devoted for governing different type transactions: for finding needed labor for hiring, land and material inputs for purchase and lease; negotiating terms of exchange; monitoring implementation of contractual obligations; adaptation of contracts to new conditions; conflicts resolution; memberships in professional organizations; relations with agrarian bureaucracy etc.

Component comparison of transacting costs could not always give idea for the efficiency of organizations since often the alternative form decreases one type of costs while increasing another type transacting costs. For instance, 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 of exchange, safeguarding investments from outside opportunism etc. On the other hand, it enlarges costs for organizational formation, decision-making, integral management, supervising and motivation of hired labor. In above example with the alternatives for marketing of output it could be preferred "internal marketing" (consumption, production utilisation, processing) as more beneficial form of organization comparing to direct sell or employment of marketing cooperative.

Moreover, a part of transactions in agriculture is governed not by "pure" but through complex or interlinked modes - e.g. inputs supply in "package" with know-how, extension or/and service supply; joint supply of inputs and credit; crediting of production against marketing of output. Thus, it is important to take into consideration the *overall* costs for organization of transactions of different types - all *external* and *internal* transaction costs of the farm.

Often it is very difficult to select a base for comparison in view that high transacting costs entirely block development of alternative organization. For instance, the 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 form for finance supply of farms. Here the comparative level of transaction costs is impossible to be determined and appreciate the "high" efficiency of integral mode relative to debt form of financing. In that case funding with "own means" and with "bank credit" are not real alternative but completely different governing structures. Thus, application of indicators for estimation of the comparative efficiency of investments based on "opportunity costs" (discounting, payback period, internal rate of return) independent from the form of funding, have no significant economic sense.

Comparative structural analysis

Another direction for evaluating efficiency of diverse agrarian organizations is the *Discrete structural analysis*[21]. Since it is either very difficult or impossible to determine absolute transaction costs for individual modes, assessment is made on comparative costs of alternative organizations. Besides, quantitative approach (absolute and relative measures, marginalism) is replaced by qualitative (structural) analysis and indirect assessment of transacting costs[22].

[21] Williamson O. (1996). The Mechanisms of Governance. New York: Oxford University Press.

[22] That is logical since individual governing structures differ each other not in marginal but qualitative –discrite structural way.

Actually, we are interested not in absolute level of transaction costs in different form, but in organization with the lowest comparative costs for a particular activity/transaction.

The new approach for assessing economic organizations turns individual transaction and the costs associated with it into *a basic unit of economic analysis*. The analysis of agrarian organizations includes following major steps: *First, the major type transactions* in which agent managing agrarian transactions (farm entrepreneurs, farmers) participates are to be determined. *Second,* the feasible *alternative forms for organization* of different type agrarian transactions in the specific environment are to be identified. *Third, critical factors* of transaction costs, and costs (and benefits) associated with alternative governing modes are to be specified. *Forth,* the *comparative efficiency* of alternative modes is to be assessed, and the effective boundaries of market and private organizations defined. *Fifth,* cases of *market and private failures,* and the needs for public intervention are to be identified. *Six, the alternative (and feasible) forms for public intervention in agrarian sector* are to be identified, their *comparative efficiency* assessed, *the best one(s)* selected.

The major types transactions in farming are associated with: labor supply, supply of land and natural resources, service supply, inputs supply, knowledge supply and know-how, innovation supply, finance supply, insurance supply, marketing of services and products. Farmer also takes part in a great variety of "collective actions" for inducing public intervention in market and private sector in own interests. Identification of employed and other feasible forms for organizations of transactions in different countries, regions, subsectors is object of a special *micro-economic survey*[23].

Next, *"critical dimensions"* of transactions are to be determined – the factors responsible for the *variation* of transaction costs in the specific economic, institutional and natural environment. They are identified as: frequency of transactions between the same partners; uncertainty surrounding transactions; specificity of assets for supporting a particular transaction; appropriability of rights associated with transactions[24].

When *recurrence* of transactions between the same partners is high, both (all) sides are interested in sustaining and minimizing costs of their relations (avoiding opportunism, building reputation, setting up incentive and adjustment mechanisms, conflict resolution devices). Here continuation of the relations with a particular partner/s and designing a special mode for transacting has a high economic value. Parties restrain for opportunism which detection is "punished" by turning to a competitor (losing future business). Besides, costs for development of a special private mode for facilitating bilateral (or multilateral) exchange could be effectively recovered by frequent exchange. For instance, instead of negotiating milk marketing after "each milking" a long-term supply contract is signed; instead of negotiating labor remuneration "for each operation" a permanent labor is hired by the cooperative; economies of scale and size for repeated transactions are realized though participation in inputs supply or marketing cooperative. When a transaction is occasional (incidental) then possibility for opportunism is great since cheating side can not be easily punished (good reputation is not of value).

When *uncertainty* surrounding transactions increases, then costs for carrying out and secure

[23] E.g. the major forms for organizations in functional areas of Bulgarian farms are analyzed by Bachev H. (2010). Management of Farm Contracts and Competitiveness, Saarbrücken: VDM Verlag.

[24] First three factors are identified by Williamson O. (1996). The Mechanisms of Governance. New York: Oxford University Press, while the forth one added by Bachev H. and M.Labonne. About Organization of Agrarian Innovations. Montpellier: INRA, (2000).

transactions go up (for overcoming information deficiency, safeguarding against risk). Since bounded rationality is crucial and opportunism can emerge agents will use such modes of organization which diminish transaction uncertainty. While certain risks could be diminished/eliminated by production management or through market mode (purchase of insurance) most transacting risk would require special private forms – trade with origins; providing guarantees; using share-rent or output-based compensation; employing economic hostages (e.g. obligatory collateral for providing a credit); participating in inputs-supply or marketing cooperative; complete integration of transactions. When transacting between same counterparts is rare, and it is not supported by specific assets, and private appropriability of rights is high, then faceless market exchange is most efficient mode. Depending on the level of uncertainty and the risk-aversion agents take different entrepreneurial risk and get normal, lower, or higher return from transactions.

Transaction costs get very high when *specific assets* for relations with particular partner are to be deployed. In this case it is impossible to change partner (alternative use of assets) without big loss in value of specific capital[25]. Relation specific/dependent investments are "locked" in transactions with particular buyer or seller and cannot be recovered (rented) through "faceless" market transactions (counterpart's "personality" matters)[26]. Costless alternative use of specific assets (loss of value) is not possible if transactions fail to occur, they are prematurely terminated, or less favorable terms are renegotiated (in contract renewal time before the end of life-span of specific capital). Therefore, dependant investment/assets have to be safeguarded by special form such as long-term or tied-up contract, interlinks, hostage taking, joint investment, quasi or complete integration. Often, later is quite expensive, investment in specific capital are not made, and activity/transactions can not take place (e.g. modern drop irrigation) or occurs without (or loss of) comparative advantages in respect to productivity (no or manual irrigation).

If a high *symmetrical* (capacity, product, timing, location etc.) dependency of assets of counterparts exists (regime of "bilateral trade") there are strong incentives in both parties to elaborate special private mode of governance. When *unilateral* (asymmetrical) dependency exists then dependent side (facing mini or total monopoly) has to protect investments against possible opportunism (behavioral uncertainty/certainty) through integrating transactions (unified organization, joint ownership, cooperative); 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).

Activity and transacting is particularly difficult when *appropriability of rights* on products, services or resources is low. "Natural" low appropriability has most of agrarian intellectual products - agro-market information, agro-meteorological forecasts, new varieties and technologies etc. Besides, all products and activities with significant positive/ or negative externalities are to be included in this group. If appropriability is low possibility for unwanted market or private exchange is great, and costs for protection (safeguard, detection of cheating, disputing) of private rights/investments extremely high[27]. Because of the bounded rationality, the costs for protection, detection, verification, and a third-party (court) punishment of unwanted exchange extremely high. For transactions with low appropriability costs and benefits are

[25] E.g. investments in production of organic milk are strongly specific for transactions with the single organic milk processor on the country.

[26] Specificity is not technological but economic characteristic of investments. Depending on socio-economic conditions the same assets could be with quite different level of specificity.

[27] E.g. fight against hail clouds or grasshoppers invasion are with a low appropriability for supplier since paying or not all farmers in the region benefit from the service. Investments in development of a new technology are with low appropriability since it could be "introduced" with one time purchase or acquired for free by a neighbor, friend in the research institute, or black market.

independent for individual participants. Therefore, agents would either over-produce (negative externalities) or under-organize such activity (positive externalities) unless they are governed by efficient private or hybrid mode - cooperation, strategic alliances, long-term contract, trade secrets, or public order.

Effective forms for agrarian organizations

The next step is to evaluate the effective potential of alternative economic organizations: to minimize bounded rationality of agents and uncertainty surrounding transactions; appropriation and protection of absolute/contracted rights (and associated private benefits and investment) from possible opportunism; recover long-term costs for organizational development through high frequency of transactions; explore economy of size and scale on specific capital etc.

Individual organizations have different comparative advantages and disadvantages to maximize benefits and minimize costs of transactions with specific critical dimensions. In general, *internal* organization/integration has advantage for governing transaction with high uncertainty and specificity (dependency) of assets, since it diminishes bounded rationality and protects investments from outside opportunism. Contrary, transactions with high certainty (bounded rationality is not important) and universal character of assets (opportunism can not be realized since transaction can be executed with another partner without additional costs) can be carried across *free market* without encountering costs for development of special private mode. *Private organization* is effective only for transactions with high recurrence between partners, since occasional (single) transactions do not let recovering ("payback") investment for development of special governance mode (mechanisms for coordination, stimulation, dispute resolution; formal registration). Finally, *markets and private forms* are appropriate for transactions with high appropriability, since they would recover invested resources through exchange. For transaction with low appropriability private rights cannot be protected (unwanted exchange) or they are enforced with extremely high costs. Thus, such transactions could be effectively governed either by *hybrid* (mixed public-private, quasi-public) or entirely *public forms* for organization.

Since transactions have different critical dimensions and governance forms have different comparative advantages it is to be *"alignment of transactions (which differ in attributes) with governance structures (which differ in costs and competence) in discriminating (mainly transaction cost economizing) way"* [28]. According to the *combination* of specific characteristics of each activity/transaction, there will be *different the most effective* form of economic organization for that particular activity (Figure 1). Agrarian transactions with good appropriability, high certainty, and universal character of investments (partner can be changed anytime without significant costs) could be effectively carried across free market through *spotlight* or *classical contracts*. Here organization of transactions with special form or within farm/firm would only bring extra costs without producing any transacting benefits.

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

[28] Williamson O. (1981). The Economics of Organization. The American Journal of Sociology 87 (3), 548–577.

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

Figure 1. Principle modes for governing of agrarian transactions

Generic modes	***Critical dimensions of transactions***								
	Appropriability								
	High								*Low*
	Assets Specificity								
	Low				*High*				
	Uncertainty								
	Low		*High*		*Low*		*High*		
	Frequency								
	High	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	
Free market	Y	Y							
Special contract			Y			Y			
Internal organization					Y		Y		
Third-party involvement				🚚				🚚	
Public intervention									🚚

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

Transactions with 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 (acquaintance with livestock, quality of farming plots) is quite specific to farm, and its supply has to be governed through permanent labor contract and coupled with ownership rights (products, assets). Capital investments in land are to be made on owned/long-leased-in rather than seasonally rented land (high site and product specificity). All "critical" to farm material assets will be internally organized - production of forage for animals; important machineries; water supply for irrigated farming etc. While universal capital could be effectively financed by market form (bank credit), highly specific investments can be only made through internal funding (own funds, equity sell, joint venture).

If the specific and specialized capital cannot be effectively organized within the farm (economy of scale/scope explored, funding made), then an effective governing form(s) outside farm-gates is to be used - group farming, joint ownership, interlinks, cooperative, lobbying for public intervention. When strong assets (capacity, technology, time of delivery, site, branding) inter-dependency with upstream/downstream partner exists, then it is not difficult to govern transactions through contract mode (strong mutual interests for cooperation and restriction of opportunism). For instance, effective supply/procurement contracts between farmers and processors are widely used in dairy, meat, vine, organic industries (symmetrical dependency).

However, very often farmers face unilateral dependency and need effective (ownership) organization to protect interests. Transacting costs for initiation and maintaining of such "collective organization" is usually great (big number of coalition, different interests of members, "free-riding") and it is either unsustainable or does not evolve at all. That creates

serious problems for efficiency/sustainability of individual farms - missing markets, monopoly/quasi-monopoly situation, impossibility to "induce" public intervention.

Serious transacting problems arise when condition of assets specificity is combined with high uncertainty, low frequency, and good appropriability. Here elaboration of special governing structure for private transacting is not justified, specific investments not made, and activity/restriction of activity fails to occur at effective scale ("market *and* contract failure"). Similar difficulties are encountered for rare transacting associated with high uncertainty and appropriability. In all these cases, *a third-part* (private, NGO, public) *involvement* in transactions is necessary (assistance, arbitration, regulation) in order to make them more efficient or possible. A particular trilateral mode is also invented such as the *neoclassical contract* which arranges "third party participation" and manages transactions with high uncertainty and asset specificity, and low frequency. The unprecedented development of special origins, organic farming, systems of "fair-trade" are good examples. There is increasing consumer's demand (premium) for organic, original, and fair-trade products. Nevertheless their supply could not be met unless effective trilateral governance including independent certification and control is put in place.

When appropriability associated with transaction/activity is low, there is no pure market mode to protect and carry out activity effectively. Respecting others rights (unwanted exchange avoided) or "granting" additional rights to others could be governed by *"good will"* or *charity actions* of individual and NGOs. For instance, a great number of voluntary environmental initiatives have emerged driven by the competition, farmers' preferences for eco-production, or responds to public pressure for a sound eco-management. 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 high frequency and mutual assets dependency exists such as unwritten accords, interlinking, bilateral or collective agreements, close-membership cooperatives, codes of professional behavior, alliances, internal organization. However, emerging of special (private) large-members organizations for dealing with low appropriability (and satisfying entire "social" demand) would be very slow and expensive, and they unlikely be sustainable in long run (free riding). Therefore, there is a strong need for *third-party public intervention* in order to make such activity possible or more effective – public organization, public contract, mandatory taxing, introduction of new property rights. For example, the 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 potential consumers, disputing). The supply of environmental protection service is very costly (production and organization costs) and would unlikely be carried out on voluntary basis. Financial compensation of farmers by willing consumers through pure market mode (tax, premium) is also ineffective due to high information asymmetry and massive enforcement costs. A third-party mode with direct public involvement would make that transaction effective: on behalf of consumers a State agency negotiates with individual farmers a public contract for "environment conservation service", coordinates activities of various agents (including direct production management), provides public payments for compensation of farmers, and controls implementation of negotiated terms[29].

[29] Namely *public eco-contracts* with farmers are widely used in countries of European Union.

Economic boundaries of the farm

The next step is to identify the range of feasible organizational forms for each generic mode for the specific context of a particular country, region, subsectors, and agent. For instance, specific varieties of the "internal organization" in agriculture includes: *one-person farm or firm, family farm or firm, group farm or firm (partnership), cooperative, corporation, public farm or firm, joint venture.* Corresponding forms of the "free market" are: *spot exchange on local, regional etc. markets; classical contract, wholesale trade etc.* The "special contract form" could be: *short-term contract, long-term contract, relational contract, interlinked organization, multilateral agreement etc.* For completing the list of alternative organisational forms in each generic type a special *micro-economic survey* is needed.

After that it could be determined the *effective (horizontal and vertical) boundaries* of individual forms on the basis if their potential to: overcome bounded rationality and transaction uncertainty, safeguard transactions and investments from the hazard of opportunism, realized economies of scale/size of specialized and specific capital, and minimized overall (production *and* transaction) costs. Achieving the efficiency though increasing productivity/benefits and the transaction costs for each form will be quite different in the specific institutional, economic and natural environment for agents with unlike characteristics and activity/transactions with specific combination of critical dimensions. Therefore, individual organizations will have quite *different efficiency and effective boundaries.* A part of agrarian transactions will be effectively governed through free market exchange; another part will be effectively organized through special contract mode(s); a part of transactions will be entirely integrated within farms of different types, while the rest protected though special private organization(s) outside of farm gates.

Detailed analysis of factors, pace of development, efficiency and economics boundaries of farms and agrarian organizations of different type during transition and EU integration in Bulgaria is done by us in previous publications[30]. For instance, the high efficiency and sustainability of numerous small (subsistent, semi market and market) farms is "explained" with the absence of another feasible or more-effective alternative for production utilization of available household resources (labor, savings, farmland)[31] in the condition of not-fully restituted private rights on resources; high uncertainty, risk and costs for market and contract transactions (lack of experience, trust, markets, financing; not-working system for enforcement of laws and contracts); lack of public support; insufficient or missing possibilities for alternative employment and/or supply with (cheap, quality) foods[32].

Similarly, "dynamic" development of many-members agricultural cooperatives during post-communist transition is a consequence of the fact that they are the single/most effective form for organization of a great part of activity (joint cultivation, plat protection, irrigation, harvesting; non-for-profit organization for supply of highly specific for members employment, foods, services, feeds for domestic/private farm livestock) in the conditions of unidentified rights on major agrarian resources, lack of possibilities (skills, financial means, time, advanced age) for organization of own farm, inherited high inter-dependency of available specialized

[30] Bachev H. (2010). Management of Farm Contracts and Competitiveness, Saarbrücken: VDM Verlag.

[31] Post 1989 privatization turned more than 2 million Bulgarians into owners of small farmland plots and shares in the property (animals, equipment, indivisible assets) of ancient public farms

[32] Even now the most of holdings in the country are subsistent or semi-market, and agriculture is a "supplementary income source" for more than 1 million Bulgarians (Agrarian paper, MAF, 2008).

capital of large number individuals[33], and undeveloped labor market, agrarian resources and main activities (services, processing, trade) in rural areas.

In the same way, the unprecedented concentration of resources and activities in a few thousands large business agri-firms is a result of the dynamic institutional environment favorable for integration of huge specific capital by entrepreneur (technological and managerial knowledge, personal connections, available combination of and/or complementarities of partners assets) allowing exploration of enormous (land consolidation, economies of size and scale, cheap and standardized products) and transaction advantages (contract and political power, preferable counterpart by large suppliers and buyers, possibilities to collect information, introduction of innovations, diversification, products promotion, adaptation to market and formal requirements, winning public projects and subsidies, risk taking, investing in good reputation and relations with partners, banks, research institutes, and public authorities).

At this stage a qualitative analysis is made on the comparative efficiency of diverse type of farms and agrarian organizations in the specific socio-economic, institutional and natural environment. It is often impossible to co-measure production and transaction costs in a qualitative term, but such "calculation" is always done by the business managers and other economic agents. Also an answer is given to the "paradox" *why a big farm can not do the same and more then a number of small farms can do, and vice verse.* Furthermore, it becomes clear inadequacy of indicators for productivity of production costs and resources for assessing efficiency of the *different* agrarian organizations. The opposite is to be expected: it has to be significant variation in the rate of profitability on investments in agro-firm (profit-making organization) from "pay-back" of expenditures and resources in cooperative (member-oriented organization), public farm (non-for-profit organization) or subsistence farm (giving opportunity for productive use of otherwise "non-tradable" family labor, land). The later is also proven by the estimates on "efficiency" of different farms in East Europe after 1989[34].

Traditional statistical and other data are less suitable for testing and wide application of the new approach. It is necessary to collect *micro-economic data* for divers transaction managed by various agrarian agents and their critical dimensions. Such information can be collected though organizing interviews with managers of different type farms and the experts in the area.

Needs and effective forms for public intervention

The Comparative structural analysis let specify existing and emerging deficiencies in organization of market and private transactions, and define the *needs for public intervention in agrarian sector* ("the economic role of government"). In modern agriculture there are always some public modes put in place along with diverse market and private organizations, and iideally it could be a case of most effective/perfect economic governance of the sector. However, usually there are a number of social, economic, environmental etc. challenges (problems, conflicts, failures, risks) associated with agrarian development. That is why, there is a constant

[33] Restituted widely dispersed small-scale land plots, farmland within a large plot with permanent crops, physically "indivisible" shares in assets of ancient farms, accumulated experience and narrow labor specialization for "collective" production.

[34] Csáki C. and Z. Lerman (2000). Structural change in the farming sectors in CEE. Washington DC; Gortova M. and S.Davidova (2003). Farm productivity and efficiency in the CEE applicant countries, Elsevier; Mathijs E. and J. Swinnen (1997). Production Organization and Efficiency during Transition, Policy Research Group.

need for improvement of public organization.

First, assessment on correspondence of public involvement to real needs of development – these are identified needs for a third-party intervention from Figure 1. The analysis is to embrace the efficiency of entire system of governance, and identify deficiencies (failures, risks) in market, private, *and* public organizations. Next, variety of alternative modes for *new* public intervention able to correct market, private and public failures have to be identified, and their comparative efficiency assessed, and most efficient one(s) selected. Finally, assessment is to be made on comparative efficiency of selected public form to other practically possible modes of governance such as partnership with private sector, fundamental property rights modernization, international cooperation etc. Accordingly, a new public intervention is to be initiated only if there is *overall net benefit* - when *effects are greater than additional (individual **and** social) costs for third-party public involvement.*

The comparative efficiency of public interventions is to be determined I terms of the potential for coordination, stimulation, conflicts resolution, and minimization of (transaction) costs. Public modes not only assist (market and private) transactions, but also are associated with significant (social and private) costs. It is essential to compare practically (technically, economically, socially) possible and alternative forms of governance. Additional *benefits* (problems to be solved, risks to be overcome, new goals to be achieved), and *costs*, and *modes* for new public intervention must be *socially acceptable*. If different forms permit achieving the same goals, then the analysis is to focus on selection of mode minimizing total (implementing and transacting) costs. If there is only one feasible form for governing of a particular intervention, it will be introduced if associated costs are *socially acceptable and possible*.

Assessment is to comprise *all* costs – direct (tax payer, assistance agency) expenses, and transacting costs of bureaucracy (for coordination, stimulation, mismanagement), and costs for individuals' participation and usage of public modes (expenses for information, paper works, payments of fees, bribes), and costs for community control over and for reorganization of bureaucracy (modernization and liquidation), and (opportunity) costs of public inaction.

Depending on uncertainty, frequency, and necessity for specific investment of public involvement, there will be different the most effective forms (Figure 2). Generally, interventions with low uncertainty and assets specificity would require *smaller public organization* (more regulatory modes; improvement of general laws and contract enforcement). When uncertainty and assets specificity of transactions increases a *special contract* mode would be necessary – employment of public contracts for provision of private services, public funding/subsidies of private activities, temporary labor contract for carrying out special public programs, leasing-out public assets for private management etc. When transactions are characterized with high assets specificity, uncertainty and frequency then internal mode and *bigger public organization* would be necessary – permanent public employment contracts, in-house integration of crucial assets in a specialized state agency or public company etc.

Figure 2: Effective modes for public intervention in agrarian sector

Level of Uncertainty, Frequency, and Assets specificity				
Low ←---------→ ***High***				
New property rights and enforcements	**New regulations**	**New taxation**	**New assistance and support**	**New public provision**

Initially, existing and emerging problems (difficulties, costs, risks, failures) in organization of market and private transactions have to be specified. The appropriate pubic involvement would be to *create environment* for: decreasing uncertainty surrounding market and private transactions, increasing intensity of exchange, protecting private rights and investments, and making private investments less dependent. For instance, State establishes and enforces quality, safety and eco-standards, certifies producers, regulates employment relations, transfers management rights on natural resources etc., and all that facilitates and intensifies (market and private) transactions and increases the efficiency of economic organizations.

Next, practically possible modes for increasing appropriability of transactions have to be considered[35]. The low appropriability is often caused by unspecified or badly specified private rights. In some cases, most effective government intervention would be to introduce and enforce *new private property rights* – on natural and biological resources; tradable quotas for products, inputs, emissions; intellectual property and origins. That is efficient when privatization of resources or introduction and enforcement of the new rights is not associated with significant costs (uncertainty, recurrence, and level of specific investment are low). That intervention transfers organization of transactions into market and private governance, liberalizes market competition and induces private incentives (and investments) in certain agrarian activities.

In other instances, it is more efficient to put in place *regulations* for trade and utilization of resources, products and services – standards for labor (safety, social security), product quality, environmental performance, animal welfare; norms for using natural resources, introduction of foreign species and GM crops, and (water, soil, air, comfort) contamination; ban on application of certain chemicals or technologies; regulations for trading ecosystem service protection; foreign trade regimes; mandatory eco-training and licensing of farm operators.

In other instances, using incentives and restrictions of *tax system* is the most effective form for intervention. Different sorts of tax preferences are widely used to create favourable conditions for development of certain (sub)sectors and regions, forms of organization, segment of population, or types of activities. For instance, environmental taxation on emissions or products (inputs, outputs of production) is applied to reduce use or emissions of harmful substances.

In some cases, *public support* to private organizations is best mode for intervention. Agrarian and rural development, environmental conservation and trans-border cooperation programs are widely used in all countries. Often providing *public information, recommendations, and training* to farmers, rural population, and consumers is the most efficient form. In some cases, *pure public organization* (in-house production, public provision) is the most effective as in case of important agro-ecosystems and national parks; agrarian research, education and

[35] E.g. assessment of the efficiency of major forms of public intervention in agro-ecosystem services are presented by Bachev, H. (2009). Governing of Agro-ecosystem Services. Modes, Efficiency, Perspectives, VDM Verlag.

extension; agro-meteorological forecasts; border sanitary and veterinary control etc.

Usually, specific modes are effective if they are applied alone with other modes of public intervention. The necessity of *combined intervention* (governance mix) is caused by: complementarities (joint effect) of individual forms; restricted potential of some less expensive forms to achieve certain (but not entire) level of socially preferred outcome; possibility to get extra benefits (e.g. "cross-compliance" requirement for participation in public programs); particularity of problems to be tackled; specific critical dimensions of governed activity; uncertainty (little knowledge, experience) associated with likely impact of new forms; administrative and financial capability of Government to fund, control, and implement different modes; and dominating policy doctrine.

The level of effective public intervention (governance) also depends on the *kind of problem* and the *scale of intervention*. There are public involvements which are to be executed at *local* (ecosystem, community, regional) level, while others require *nationwide* governance. And finally, there are activities, which are to be initiated and coordinated at international (regional, European, worldwide) level due to strong necessity for *trans-border actions* (needs for cooperation in natural resources management, exploration of economies of scale and scale, governing of spill-overs) or consistent (national, local) government failures. Very frequently effective governance of many problems and risks requires *multilevel governance* with system of combined actions at various levels involving diverse range of actors and geographical scales.

The public (regulatory, provision, inspecting) modes must have built mechanisms for *increasing competency* (decrease bounded rationality, powerlessness) of bureaucrats, beneficiaries, interests groups and public as well as *restricting possible opportunism* (cheating, interlinking, abuse of power) of public officers and stakeholders. That could be made by training, introducing new assessment and communication technologies, increasing transparency (independent assessment and audit), and involving experts, beneficiaries, and interests groups in management of public modes at all levels. Furthermore, applying *"market like"* mechanisms (competition, public auctions) in projects design, selection and implementation also increase incentives and decrease overall costs.

The *pure* public organization should be used as a *"last resort"* when all other modes do not work effectively. "In-house" public organization has higher (direct/indirect) costs for setting up, running, controlling, reorganization, and liquidation. Unlike market and private forms there is not automatic mechanism (competition) for sorting out less-effective modes[36]. Here public "decision-making" is required which is associated with high costs and time, and it is influenced by strong private interests (lobbying groups, policy makers and associates, bureaucrats) rather than efficiency. What is more, widespread "inefficiency by design" of public modes is practiced to secure (rent-taking) positions of certain interest groups, stakeholders, bureaucrats. Along with development of general institutional environment ("The Rule of Law", transparency) and measurement, communication etc. technologies, the efficiency of pro-market modes (regulation, information, recommendation) and contract forms would get bigger advantages over internal less flexible public arrangements.

The *hybrid modes* (public-private partnership) are much more efficient than pure public forms given coordination, incentives, and control advantages. Involvement of farmers, beneficiaries and interest groups increases efficiency, decreases asymmetry of information,

[36] Around the world there are a lot ineffective but highly "sustainable" public organizations.

restricts opportunisms, increases incentives for private costs-sharing, reduces management costs. That is determined by farmers information superiority, strong interlinks of activity with traditional food production (economy of scope), high assets specificity to farm (farmers competence, high cite-specificity of investments to farm, land, eco-system), spatial interdependency (needs for cooperation of farmers at ecosystem or regional level), farm's origin of negative externalities. For instance, enforcement of most labor, animal welfare, environmental standards is often very difficult or impossible. Stimulating and supporting (assisting, training, funding) private voluntary actions are much more effective then mandatory public modes in terms of incentive, coordination, enforcement, and disputing costs.

If there is strong need for third-party public involvement but effective (government, local authority, international assistance) intervention is not introduced in a due time, agrarian "development" is substantially deformed. The *public (Government) failure* is also possible and often prevails. In Bulgaria, there have been a great number of bad examples for public under- and over-interventions in agrarian sector during post-communist transition now. Consequently, primitive and uncompetitive small-scale farming; predominance of over-integrated and personalized exchanges; ineffective and corrupted agrarian bureaucracy; blocking out all class of agrarian transactions (innovation and extension supply, long-term credit supply, supply of infrastructure and environmental goods); and developed large informal sector, all they come out.

The comparative analysis let us *improve design* of new forms of public intervention according to specific market, institutional and natural environment of a particular country, region, sub-sector, and in terms of perfection of coordination, adaptation, information, stimulation, restriction of opportunism, controlling of participating actors (decision-makers, implementers, beneficiaries, other stakeholders). It unable us to predict likely cases of *new* public (local, national, international) failures due to impossibility to mobilize sufficient political support and necessary resources and/or ineffective implementation of otherwise "good" policies in specific economic and institutional environment of a particular country, region, sub-sector. Since *public* failure is a feasible option its timely detection permits foreseeing the persistence or rising of certain problems in agrarian development, and informing (local, international) community about associated risks.

Conclusion

In the unreal economy "without institutions and transaction costs" the theory of agrarian organization is very simple - there is no economic need for organizations. There is a single mechanism for governing organizing, coordinating, and stimulating the entire economic activities – the free market. "Situation of efficiency" is easily achieved since agrarian agents (individuals, households, firms) automatically and costlessly adapt behavior according to movements of market prices and changes in production technologies. In the real agrarian economy with diverse agents, institutions and transaction costs there is place for other effective (non-market) modes for organization – farms of different types and sizes, contracts, public and hybrid forms. "The old" problem of efficiency founds a "new" dimension through incorporation into analysis of the costs of transacting as the accent is put on assessment of the comparative efficiency of all (rather then only a part) of alternative modes for economic organization. It also becomes absurd the traditional "black box" approach in analysis of governing structures and the

productivity as a sole indicator for efficiency of different type of farms.

Suggested new framework helps us better understand the factors for organizational choice and efficiency, and needs for public intervention in agrarian sector. The analysis of transaction costs identifies immense range of “market failures” associated with badly specified property rights and inefficient system for their enforcement; the high uncertainty and dependency of activity, low appropriability etc. Private agents “deal” with market deficiency developing different non-market forms for effective governance such as contracts, internal modes, trilateral private organization, collective actions. Private sector also “fails” to safeguard individual rights and carry out certain activities at effective scale (technological development, eco-management). There is strong need for a third-party public involvement in market and private transactions though institutional modernization, assistance, regulation, hybrid or in-house public organization. Diverse forms of public interventions are with unequal efficiency in the specific environment of individual countries, regions, and sectors, and the most efficient ones are to be selected taking into account the transaction costs and contribution to sustainable development. The “public failure” is also possible, and inappropriate involvements, under or over-regulations, mismanagement, corruption are widespread. Agrarian sustainability is compromised when market and private sector fails, and no effective public intervention takes place - imperfect institutional structure is not reformed, delayed or bad government interventions prevail, fruitless international assistance dominate, and needed global governance is not established.

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