

Risk Governance in Bulgarian Dairy Farming

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Abstract — This paper identifies and assesses the efficiency of major modes for risk governance in Bulgarian dairy farming. Firstly, New Institutional Economics is incorporated and framework for analyzing governance of natural, market, private, and social (institutional) risks presented. Next, major types of risks faced by the dairy farms are specified and dominant market, private, public and hybrid modes of risk governance assessed. Finally, principal forms of risks caused by the dairy farms are identified, and efficiency of governing structure assessed.

The development of Bulgarian dairy farming has been associated with quite specific risk structures facing by and causing from this sector. The huge market and institutional instability and uncertainty, and the high transaction costs, blocked evolution of effective market and collective modes for risk protection. A variety of private modes (internal organization, vertical integration, interlinking) emerged to deal with the significant natural, market, private, and social risks faced by the dairy farms and the other affected agents. Nevertheless, diverse risks associated with the dairy farming have not been effectively governed and persist during transition now. That is a consequence of ineffective public (Government, international assistance) intervention to correct market and private sector failures in the risk governance. The later have had considerable negative impacts on the evolution of farms, development of markets, structure of production and consumption, state of environment etc. Certain risks related to the dairy sector “disappeared” due to the lack of effective risk governance and the declining dairy farming. That would lead to further deformation in development of the dairy and related sectors unless effective public measures are taken to mitigate existing problems and risks.

Keywords—risk management, dairy, Bulgaria.

I. INTRODUCTION

The post-communist transition and EU integration affected profoundly Bulgarian dairy farming. Small-scale holdings, low productivity, little market-

orientation, non-compliance with quality, environmental etc. standards dominate (1). The state and prospects of dairy sector is shaped by structure of risk and efficiency of risk governance. This paper identifies and assesses efficiency of major modes for risk governance in Bulgarian dairy farms. It incorporates the New Institutional Economics (2, 3, 4, 5), and presents framework for analyzing risk governance. Next, it specifies principal forms of risks confronted by and originated from dairy farms and evaluates efficiency of dominant governance modes.

II. FRAMEWORK OF ANALYSIS

Risk related to dairy farms is understood as any current or future hazard (event) with significant negative impact(s). It could be result of nature and/or human activities. Risk could be faced by the dairy farm (risk on farm) or caused by the dairy farm (risk from farm). Four generic types of risks could be specified – natural, market, private, and social. Risk is big when there is a great likelihood of risky event to occur and that is combined with substantial negative consequences. When risk is considerable it is associated with significant costs which sometimes are hardly expressed in monetary terms. Thus rational agents will be interested to invest in risk prevention and reduction.

Risk governance comprises action(s) for reducing or eliminating risk and its negative consequences. It could be done through improving production management but often requires an effective governance of relations with other agents - exchange of rights, resource coalition, collective actions etc. Accordingly, a risk could be governed through market, private, public or hybrid mode. Individual forms are with unequal efficiency since they have dissimilar potential to reduce likelihood and impact of risk, and command different costs. The market or collective governance has advantages over the internal mode since they allow exploration of economies of

scale/scope in risk assurance and recovery. However, risk trading/sharing is often associated with significant costs for finding best partners and prices, formulating and disputing exchange terms, safeguarding against opportunism etc.

When property rights are not well-defined and/or enforced and transaction costs are high the type of governance is essential. The internal mode is often preferred because of the comparative protective and costs advantages. The enormous transaction costs could even block the development of insurance market or emergence of a collective risk-sharing organization. Institutional restrictions could make some governance modes impossible¹. Depending on the individuals characteristics (risk-aversion, managerial ability etc.), and the specific natural, market and institutional environment, there will be different efficient forms for a particular risk and a governance mix will always exist.

The risk management leads to reduction/removal of risk. It is always connected with needs for a trade-off between the benefits from reducing risk and related governance costs. Effective management of one type risk might be associated with exposure to other risk/costs. Overall risk exposure is determined by the “critical” risk and the integral is rarely sum of individual risks. Thus a comparative analysis is to be employed to select among the feasible forms the most efficient one (s) reducing overall risk to “acceptable” level and minimizing total (risk assurance and governance) costs.

Most elements of risk governance are hard to quantify. That is why a discrete structural analysis is needed to match the risk features (probability, significance, acceptance level, needs for collective action) with the comparative advantages of alternative modes to overcome, reduce, control, share, dispute, and minimize costs of that risk. The risk management is part of the overall governance of production, consumption, and transaction activities of agents (6). Thus the total efficiency (advantages, costs-saving and risk-minimization potential) of various modes are to be taken into account. Since minimization of transaction costs is crucial the identification of their institutional, behavioral, dimensional, and technological factors is essential.

¹ Risk assuring monopolies/cartels are usually illegal.

According to the specific natural, market and institutional environment, individuals’ characteristics, social preferences etc. various structure of risk governance could evolve. In one extreme, the risk management system would work well and only “normal“(entrepreneurial) risk would be left “ungoverned”. Market and private governance may fail but an effective public involvement could cure the problem. Often needed public intervention is not put in place and that affects adversely the farms size and sustainability, markets development, evolution of production and consumption, state of environment etc.

III. GOVERNING RISKS FOR DAIRY FARMS

A. *Natural risks*

Most dairy farms in Bulgaria use traditional methods to protect from natural hazards: small-sized farm, more sustainable animal and crop varieties, appropriate livestock structure, private dogs and guards, production diversification, remoteness of plots, keeping “emergency fund” etc.

During much of the transition farms had no access to specialized insurance products since they were either unavailable or expensive. Agrarian insurance market has been developing in last years but it is not wide-used (Fig.1). Larger farms have stronger incentives to sell the risk because they are highly specialized and damages are significant from hazardous events. Big enterprises possess financial means to insure farm assets, better negotiating position for favorable insurance terms (contracting power, possibilities to explore scale and/or scope economies, on-farm experts). “Purchase of insurance” is explicitly requested by banks and public agencies for participating in diverse programs. These farms are main recipients of such loans/grants and pay supplementary price (for insurance supply) to obtain the “interlinked” outside funding.

Most farms can not afford a purchase of risk insurance because of the high costs, unfavorable/not-tailored terms, dissatisfaction from services (disputes on terms/extend of harms, delay payment). Insurance companies are reluctant to deal with small farms because of the miniature size (high transacting costs, low profit), and high possibilities for pre-/post-

contractual opportunism. Consequently, most farming resources, activities, and labor are not assured, and farms bear the entire risk of natural hazards.

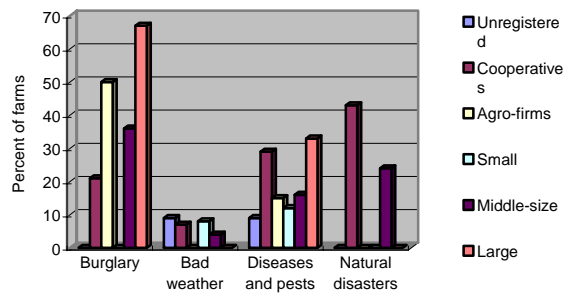


Fig. 1, Type of purchased insurance by Bulgarian dairy farms
Source: interviews, farm managers

Despite potential efficiency (economies of scale and/or scope, non-for-profit/members orientation) collective modes have not evolved. High transaction costs for initiation and development, and conflicting interests of different farms impedes that process. Public intervention has not been undertaken to assist (initiate, legislate) farmers in organization of quasi-public/quasi-private mode for collective supply of insurance.

In recent years, public control and emergency assistance to livestock holdings has been enhanced. These measures aim at protecting against significant industry/public risk(s) from certain animal diseases. Some farms also got public-aid to cover losses from natural disasters but that affected larger-operators having capacity to deal with bureaucratic procedures.

Subsequently, most farms do not have proper outside (market, collective, public) insurance against natural risks and face constantly hazards and damages. Affected smaller and middle-size farms experience severe losses, and see their assets, scale of operations, and welfare further decreased.

B. Market risks

Market risk in dairy farming is mostly associated with: high market uncertainty in terms of demand for milk, quality requirements, supply of critical inputs; huge competition and price fluctuation;

(semi)monopoly condition in inputs supply and marketing; and missing markets situation.

Unlike natural risk, market-related risk cannot be assured by purchase of an insurance. A special governance is to be put in place to safeguard farmers' investments.

The emergence/persistence of a vast subsistence and part-time farming has been an effective mode to protect household assets and labor in conditions of a great institutional and economic uncertainty (1). During transition market and contract trade of owned capital was either impossible or very expensive ("missing" markets, high uncertainty, information asymmetry, opportunism, little job opportunities and security). There was also a great uncertainty associated with the market supply of basic foods in terms of costs, stability, quality etc. The internal family production was the most effective way of protecting and getting return on resources. Similarly, missing markets for critical farm inputs and services were major reasons for development and sustainability of production cooperatives. Big interdependence and complementarities of assets, "not-for-profit" and membership orientation attracted many small-scale farms. Coops evolved as an effective (cheap, stable) form of supplying highly specific to farms forage, mechanization service, essential inputs, storage, processing etc.

Larger farms integrate entirely the forage supply exploring economies of scale and/or scope and safeguarding against risk associated with price, quality, time of delivery, behavioral uncertainty etc. of outside procurement. Our survey demonstrates that all commercial farms secure a significant portion of needed forage for livestock though an own-production. Likewise, they own (rather than rent) dairy animals, and all critical assets (milking equipment, barns, machineries) are either owned or protected through a long-lease contact. Furthermore, a private form to govern the bilateral trade between bigger farms and processor has been increasingly employed interlinking supply of the critical inputs (forage, cooling tanks) with the marketing of output (Fig. 2). Later diminishes considerably the risk from market inputs supply and marketing of output of dairy farms, and increases the incentives for productive investments.

The significant risks from market supply of critical labor and services are typically governed through a private mode. In dairy farming most managerial and technological knowledge and even “relationships” with animals are highly farm-specific and extremely important for productivity. Therefore, the critical activities are secured by the family labor and the permanent employment (management, everyday care for animals).

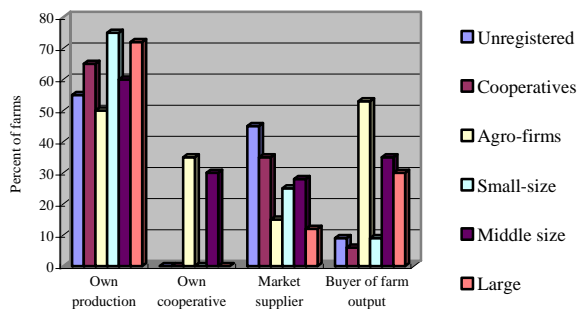


Fig. 2, Modes of forage supply in Bulgarian livestock farms
Source: interviews, farm managers

Most dairy farms report facing significant risks in milk marketing. Firstly, price and quality competition increases all the time (including cheap import of powder milk for processing, consumers goods). Not surprisingly all commercial farms want to see the milk price augmented in order to allow a modern production.

Secondly, in some regions farmers face monopolies experiencing price-discrimination, delayed payments, not-fulfillment of contracted terms etc. The individual producers can not store fresh milk and/or transport it to a long distance (low market appropriability of rights, high cite/freshness dependency of dairy farm). The incentives to cooperate between competing producers and neutralize regional monopolies have been low (high transaction costs, opportunism of free-rider type).

Third, many smaller-scale dairy farms have been entirely ignored by the dominating large processors since they are not able to meet quantity and quality requirements, and command high transportation, training, and transaction costs. These farms have only available restricted local fresh-milk market with an insignificant demand from minor processors, “street

market” or direct delivery to individuals. What is more, in some milk-producing but remote areas farmers experience complete missing market situation.

Effective private modes have emerged to deal with marketing risks. When high capacity, quality, time of delivery, origin etc. dependency with a particular buyer is in place then there are strong bilateral incentives for integration. Diverse modes for marketing arrangements are increasingly applied such as long-term delivery contacts, price guarantees, premiums, interlinks etc. There are also few good examples for collective organizations of marketing with effective negotiating and enforcing relationships with downstream partners. A prospective mode for protection of highly specialized and specific investments is organic and eco-production comprises merely 5 farms with 722 animals (2007).

The two associations of dairy producers attracted few farms because of the inefficiency in protecting producers’ interests with processors and lobbying for public support. The sporadic attempts for “collective” actions of milk producers (protests, milk poring, blocking highways) have given no positive results. Consequently, there are huge income variation for the different farms, regions, and years, and constant reduction in number of farms and animals.

Public production quotas for cow milk was introduced (2007) aiming at diminishing risk from income instability. Experience shows that individual quotas exceed nationwide (10%) and hardly would eliminate the market risks. Thus further diversification into the cheep, goat and buffalo productions (where no quotas exists) is to be expected.

C. Risks from private agents

The major risks from individuals and private agents is associated with: burglaries and other intrusions on farm livestock, yields, property; the opportunistic behavior(s) in contractual relations with hired labor, inputs and service suppliers, buyers of output, coalition members; farming or another activity adversely affecting dairy holdings (pollution; unwanted “security services” etc.).

There is not an effective public system (police, guards, court) for protection and recovery of ownership and punishment of offenders. Farmers are

extremely vulnerable for thieves and organized crimes - most farm output and property is “in open”, dispersed in wide areas and many locations. The permanent risk for agrarian property is widely assured by private modes. Our survey found that “costs for protection” for all type farms are significant in terms of time and resources spent, hired security guards and services, “payments for property protection and restoration”. The insurance coverage against burglary is most used market assurance by the bigger producers (Fig.1).

High transitional uncertainty and insecurity (reputation is not important, difficulties to formulate and dispute contracts), little contractual experience (difficulties to protect interests), impossibility to write complete (labor, service) contract in farming and dispute terms, high cost for contract enforcement through the court system (inefficiency, corruption), are responsible for the considerable risk for contractual failure². Most farm managers consider the “respecting laws and private contracts” as one of the most important factors for the dairy farms development (Fig.3).

In order to mitigate risk from pre and/or post-contractual opportunism the private modes are broadly employed. Since possibilities for opportunisms are great (high information asymmetry, uncertainty, costs for supervision and direction) it is typical to use self-enforced own or family labor for the critical operations (1). The operation size in most dairy farms is determined by the available household labor. Small partnerships are practiced exclusively between relatives and friends where costs for coordination, decision-making and motivation is low (mutual goals and trust govern relations). The large holdings hire additional core labor on permanent basis and output-based compensation, interlinking, social disbursements, paid holidays are further used to enhance motivation. Similarly, the high-dependency from a particular buyer is effectively governed through reciprocal (rather than classical) contracts interlinking the inputs, and/or credit, and/or extension supply against the milk marketing.

² No insurance for protection from “contractual risks” could be bought on market.

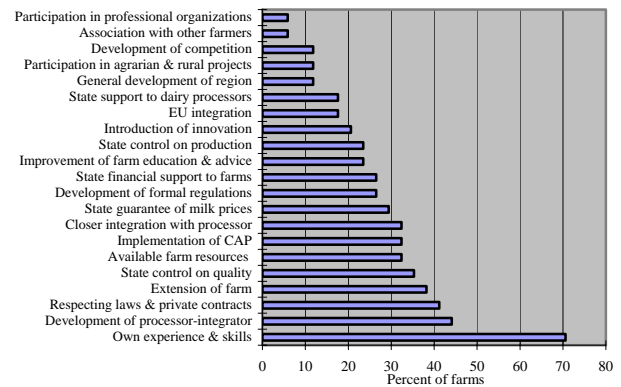


Fig. 3, Most significant factors for development of dairy farms
Source: survey data, Plovdiv region

The large collective (production, inputs supply, marketing, processing) modes are rare because of the diversified interests of farmers (different age, unlike size and type of operations, extend of diversification and market orientation); bad perception of the “collective” forms (mismanagement); the huge transaction costs for initiation and development; the lack of appropriate legislation and incentives for association until recently.

There are situations where dairy farms are badly affected by the harmful activities of other farms and industries causing pollution or other damages. There are cases of conflicts of interests over limited natural resources with other agents. Farmers have no means to defend against such hazards since appropriate legislation is not in place (no farmers rights) or it is difficult (costly) to protect or dispute assigned rights though the existing forms. The farmers suffer considerable damages (on produce yields and quality, animal welfare), perform below safety and quality standards, reduce or cease livestock activities.

D. Institutional risks

The transition has been associated with unprecedented changes in the institutional structure. There has been a huge uncertainty about directions and kind of changes, and instability (dynamics, constant amendments, controversies) in rights, legislation, regulations, taxation, public organizations, authorities responsibilities etc. The public administration has been ineffective, incompetent,

unpredictable, and corrupted. Carrying out farming and business in such environment has been associated with significant risks and costs for studying, complying with, safeguarding from the formal regulations and the “informal rules” of bureaucracy.

Most livestock operation has been carried by numerous small-scale and primitive holdings often located within residential borders. They contribute significantly to air, water and soils pollutions, and discomfort of local population. Conflicts between farms and neighborhoods are common and bring about strong community demand (formal and informal pressure) to limit or relocate activities. Carrying out livestock activity is risky because of the frictions with community and uncertainty about the potential needs and costs for adaptation. That particular risk has been responsible for the low (investment) incentives for modernization which additionally contributed to the greater exposure to natural, market, and other institutional risks.

A considerable risk for most dairy farms comes from the uncertainty (presently “certainty”) surrounding modes of introduction of the CAP. EU quality, hygiene, veterinary, environment, animal-welfare standards are in force (since 2007) and there are only 900 farms with 50000 cows meeting EU raw-milk quality standards (0,5% of the cow-farms and 13% of the cows in the country (2007). Most holdings with milking cows (81%) have no milking installations and merely 0.1% of the dairy farms are with safe manure pile cites. There is a transition period for the adaptation to the new requirements (until 2009) and public measures are envisaged to support modernization and market orientation of the farms.

Our survey of commercial dairy farms has found out that different type farms have unequal capacity for adaptation to the new EU requirements. Most holdings have no sufficient potential for adjustment to the new institutional requirements (Table 1). That is particularly truth for the small-scale unregistered producers which dominate in the sector. Only a third of the dairy farms believe their production capacity corresponds to the modern requirements of competition, productivity, eco-performance, and animal welfare. Merely one-seventh of them have internal capacity or access to outside sources to fund necessary investment associated with the adaptation to

the new norms. Thus, most dairy farms are effectively at risk to cease legal commercial activity by 2009.

Table 1 Farms with big and good capacity for adaptation to EU requirements for dairy sector (percent)

Farms capacity	Unregi-stered	Firms	Coops	Total
Knowledge on new requirements	22.7	63.6	100	38.2
Available skills and knowledge for adaptation	22.7	54.5	100	35.3
Available production capacity	27.3	45.4		32.3
Improving quality and hygiene standards	36.4	72.7	100	50
Improving animal welfare	31.8	72.7		44.1
Improving eco-performance	31.8	54.5		38.2
Finding necessary investment	9.1	27.3		14.7

Source: survey data, Plovdiv region

A market orientation of the huge (semi)subsistence farming is not feasible because of the high costs for farm enlargement and adjustment to the new market and institutional environment (no entrepreneurial capital available, low investment and training capability of aged managers etc.). There will be technically and politically impossible to enforce the official standards in the enormous informal sector. Thus no immediate institutional risk for these farms exists and they will dominate in years to come.

IV. GOVERNING RISKS FROM DAIRY FARMS

The major risks to the environment from the dairy farms are associated with the pollution of soils and waters; the unsustainable use of farmland and grasslands; and the significant contribution to greenhouse-gas emissions (7). Until recently the voluntary initiatives, private organizations, market driven modes (e.g. organic farming), and public intervention, all had no significant importance for the protection of environment and the governing of eco-risks from dairy farming. The cross-compliance eco-requirement and a range of public eco-measures are introduced with the CAP implementation – eco-conditionality, eco-standards, eco-regulations, eco-education, financial support to eco-activities, organic

farming, zones with eco-difficulties, market-orientation and diversification of farms etc.

The livestock farming has been a significant risk to the public mostly associated with: the quality, authenticity, and safety of livestock products; the livestock diseases considerable threat to human health; the new public, ethical etc. concerns about environment preservation and improvement, animal welfare, keeping tradition etc. All that brings to a life appropriate policies, regulations and support measures. There has been an increasing pressure, control, and sanctions on dairy farms both by the processors and the state for complying with the new requirements (Table 2). Most dairy farms had to make/are being undertaking significant changes related to the novel institutional requirements in order to sell milk (Fig. 4).

Surveys show that many of the EU regulations are not well-known by the implementing authorities and most farmers (7). The lack of readiness and experiences would require some time lag until the "full" implementation of CAP. Besides, most farm managers have no adequate training and managerial capability, are old in age with small learning and adaptation potential. Therefore, there will be significant inequalities in application of the new laws and standards in diverse sectors, farms of different type and size, and various regions of the country.

Table 2 Control from "Dimitar Madzarov" LTD and state on farms (percent)

Control on:	"Dimitar Madzarov" LTD	State
Milk quality	94.1	52.9
Milk safety	47.1	17.6
Hygiene of production	58.8	44.1
Animal health	20.6	55.9
Forage for animals	11.8	35.3
Care for animals	8.8	35.3
Care for environment	8.8	41.2
Control is permanent	2.9	20.6
Sanctions and punishments are applied	38.2	8.8

Source: survey data, Plovdiv region

Dairy farms pose a considerable risks to other farms, individuals, and private agents. There are many incidences for using others grasslands/crop yields, or otherwise damaging land and property by dairy farmers. Some dairy holdings are serious risk for the

comport of individuals and others businesses (e.g. organic farms, recreation/tourism operators, water suppliers). These risks are mitigated privately by the affected individuals and businesses through negotiating, monitoring, employing guards, or illegitimate means.

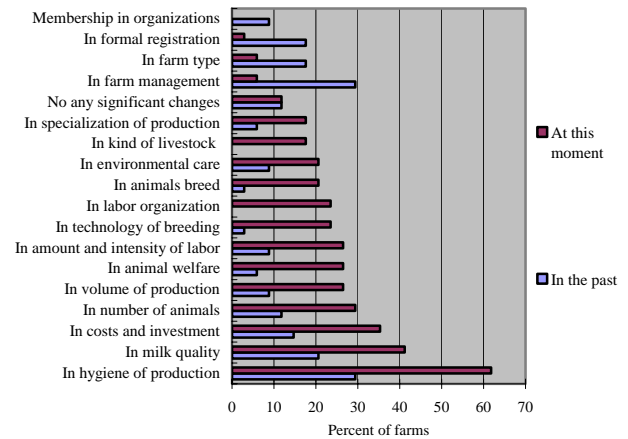


Fig. 4, Changes to be made to sell milk to "D. Madzarov" LTD
Source: survey data, Plovdiv region

The small-scale and semi-subsistence farms have been the major milk suppliers to the dairy processors putting them in a big (capacity, cite, quality, origin, safety) dependency. Divers private modes are broadly used by the processors to deal with those risks. We have identified an effective system for governing the risk in relations of "Dimitar Madzarov" LTD with more than 1000 small-scale milk suppliers from Plovdiv region. In last 10 years this dairy-processor developed a comprehensive system for protection of interests, and coordination, stimulation, controlling, and conflict resolution with farmers including: building a good reputation and trust, constant communications, regular group discussions of problems, training of farmers in new industry and institutional requirements, using written delivery contracts, significant relation-specific on-farm investments (milk collecting, cooling, and controlling facilities and staff), permanent verification of quality and registration of delivered milk by each farm, punishment for offenders, effective and regular payment mode, differential prices stimulating farm enlargement and increasing milk-supply, interlinking interest-free crediting against marketing of milk,

providing assistance to farmers in construction and preparation public support projects, encouraging farms grouping. Namely this special governance has contributed considerably for a tighter integration with the dairy farms, increasing efficiency of the bilateral relations, enhancing farms relation investments, and their adaptation to the company's requirements for milk quality and quantity (Fig.5). Involved farms consider the development of "Dimitar Madzarov" LTD as one of the most important factors for their own farm development (Fig. 3).

The dairy farming has been responsible for great risks to markets during transition now. There was deficiency in quantity of different type milks during market adjustments in first years of transformation. Risks of insufficient supply and price volatility were successfully overcome by the market (rather than failed public) governance – opening-up markets, development of market competition and demand etc. Up-to-date the risk for consumers associated with the authentic quality, safety, origin of milk and dairy products is a serious issue.

The introduction of the EU standards for milk production and trade is causing a new risk for insufficient supply of local milk. The biggest dairy-processors are trying to overcome the shortages of quality local milk through processing imported powder-milk. They increasingly face another problem(risk) of low consumer demand for dairy products based of non-fresh milk. In order to deal with that capacity/quality deficiency risk some processors are introducing specific modes for risk governance – origin and quality guarantee, brand names, traditional and eco-products. The later has brought a variety of private modes for governing vertical relations backwards with the supplying farmers, and upwards with the food chains, retailers, and importers (1).

A public intervention is also undertaken aiming at modernizing and commercializing dairy farms, and stimulating production of local and eco-products - introduction and protection of rights on traditional and organic products, subsidies for modernization of farms and adaptation to EU quality and safety standards, support for market-orientation, public training and advisory services to farmers etc.

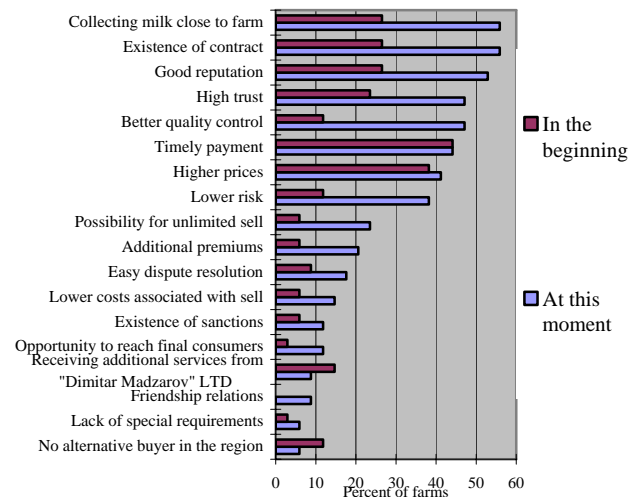


Fig. 5, Main reasons for selling milk to "D. Madzarov" LTD
Source: survey data, Plovdiv region

V. CONCLUSIONS

Our analysis of the post-communist development of dairy farming identified quite specific risk structures facing by and causing from this sector of the Bulgarian agriculture. The huge market and institutional instability and uncertainty, and the high transaction costs, blocked evolution of effective market and collective modes for risk protection. A great variety of private modes (internal organization, vertical integration, interlinking) emerged to deal with the significant natural, market, private, and institutional risks faced by the dairy farms and the affected agents. Diverse risks associated with the dairy farming were not effectively governed and persist during transition now. That was consequence of ineffective public (Government, international assistance) intervention to correct market and private sector failures in the risk governance. The later had considerable negative impacts on evolution of (size, productivity, sustainability of) farms, development of markets, structure of production and consumption, and state of environment. Certain risks related to the dairy sector "disappeared" due to the ineffective risk governance and the declining dairy farming. That would lead to a further deformation in development of the dairy and related sectors unless effective public measures

(regulations, assistance, control) are taken to mitigate existing problems (risks).

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