Public Support for Market Risk Management in Bulgarian Agricultural Holdings

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Abstract

The growing uncertainty of the external environment presents economic organizations in agriculture with new challenges for building sustainability. The purpose of this paper is to examine the potential of the public toolkit in Bulgaria to stimulate and demotivate market risk management in agricultural holdings. A set of indicators was synthesized to assess the potential of publicly funded instruments to impact farming strategies. Based on secondary data analysis, it is concluded that market risk management support is entirely designed to address the consequences of risk events and has a high potential to constrain producers' risk prevention and mitigation initiatives.

Keywords: risk management strategies, agriculture, public support

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Introduction

Agriculture is a particularly risky business. The variation in yields results in price fluctuations, and the peculiarities of the price elasticity of demand and supply reinforce the effect of price volatility. Along with the inherent high levels of price risk, the long-term changing climate contributes to the frequency of risk events in the sector - in recent years, weather events are more extreme, the frequency of damage caused by pests and disease outbreaks is increasing. Trade restrictions and changes in consumption patterns also lead to imbalances between supply and demand and cause disruptions in some product markets. All of these events cannot be controlled by farmers, but they have a direct impact on agribusiness returns and form the "new normal" to which agricultural producers must adapt. By increasing their potential to successfully respond to unexpected and adverse events, farmers are in a better position to survive and reduce the adverse effects of uncertainty. In this regard, the policy approach to support risk management at the "producer" level is a particularly important issue. Government programs can encourage but could also crowd out and compete with private initiatives.

The purpose of this paper is to examine the potential of the public toolkit in Bulgaria to stimulate or demotivate market risk management in agricultural holdings

First, some specifics of public intervention in risk management in agriculture were theoretically investigated. Then, based on selected indicators, the potential of the policy toolkit to influence farmers' initiatives to deal with the existing uncertainty were assessed.

1. Literature review

The need for political participation in agricultural risk management is argued in the literature in two main directions (Jesus, 2008). The first group of motives is related to the failure of the market mechanism to economically allocate resources for risk management in agriculture. Such a situation occurs relatively often in this sector and can be caused by reasons such as market power of insurance providers, asymmetric information and moral hazard, non-marketability of systemic and catastrophe risk (Miranda et al., 1997). Another set of reasons is the unequal resource status of farmers - here an argument for political intervention is the achievement of a certain level of social justice.

Alongside arguments for the need for support for risk management in agriculture, some studies also advocate the understanding that policy measures should leave as much room as possible for private activity and market decisions (Tangermann, 2011). Discussions on determining the

appropriate level of risk management recognize that sometimes political interference in risk management in agriculture can crowd out private initiatives at higher overall costs (World Bank, 2016). At best, government agricultural risk management policies focus on efficient resource allocation rather than income redistribution, except where catastrophic risks are concerned (Tangermann, 2011). In other words, agricultural risk management policies should be primarily aimed at overcoming market failures, and agricultural income support is a risk management tool only if it is provided in the form of disaster relief. The existence of ex post support for risk management (including disaster relief) is also considered to reduce incentives to manage risk at the farm level (Agricultural Markets Task Force, 2016). Any non-market response to risk affects farmers' perceptions of the limits of their own responsibility. It is part of the overall risk management system that farmers consider when making their own decisions.

In line with the understanding that government intervention is warranted only in cases of market failure, and markets for agricultural risk management instruments most often fail to manage catastrophic events, the Organization for Economic Co-operation and Development (OECD, 2009) proposes the so-called "Optimal Model of Government Policies and Farmer Risk Management Strategies". The risk in agriculture is divided into segments (layers) based on two criteria, namely: "probability of occurrence" and "degree of losses". For each of the risk segments identified in this way, the most appropriate policy instruments and private management strategies are indicated. Specifically, the authors distinguish three layers of agriculture-related risk. The first layer is the so-called normal risk or risk retention segment. Such risky events occur very often, but cause relatively small losses. Farmers can relatively easily manage this type of risk themselves using the strategies available at the "farm" level, for example through savings/financial reserves. Direct involvement of the state in normal risk management is not recommended. Intervention in this segment is only justified if it aims to contribute to more effective risk management by farmers, for example through training on appropriate strategies (OECD, 2009, Bachev, 2012). The second layer corresponds to risks that are associated with larger losses and occur less often, but can be managed at the "market" level, for example through co-operating, futures or forward transactions. Third is the catastrophic risk layer or market failure layer. It involves risks that are catastrophic in nature as they generate very large losses even if their frequency is low. This type of risk cannot be transferred or shared through the market. The authors acknowledge that there is no single and accurate way to define an event as catastrophic in general and in agriculture in particular (OECD, 2009). For the event to be catastrophic, it is very likely to be systemic - difficult to overcome for a large number of farmers, and also severe for a country or region as a whole. Because catastrophic risks are generally ineffectively managed without government intervention, they often trigger some special assistance or follow-up management program. In this case, the risk is denoted by the term "crisis".

The reviewed studies discuss a variety of types of decisions regarding the course of action taken related to the configuration of public resources with a view to reducing the variability of farmers' incomes (ie, reducing the level of risk). Some authors (Mathijs, E., 2017) assume that the share of public expenditure should be lower before the occurrence of the risk (so as not to discourage private financing of risk management mechanisms) and higher when dealing with the risk. On the other hand, since when planning the funds needed to limit possible losses, farmers take into account the support they would receive in the event of a risk materializing, the aid to deal with the risk has the potential to disincentivize private initiatives if not implemented balanced with measures that incentivize agricultural producers to manage risk at the farm level (Buckwell, A. et al., 2017).

In order to draw a line between intervention in risk management in agriculture and all other policies that affect the sector, the Organization for Economic Co-operation and Development (OECD, 2009) suggests that the criterion of distinction should be the objective of the introduction of the relevant policy instrument (i.e. the policy objective the instrument is designed to fulfill). The cited study argues for the understanding that if an instrument is designed to increase the general

welfare of farmers, it is more effective in transferring income to farmers; similarly, if the policy measure aims to reduce risk, it is designed to be relatively effective in reducing the variability of agricultural incomes. We find this guideline useful for its clarity.

2. Methodology

Data on public financial support under schemes and measures included in the toolkit of the Risk and Crisis Management Program in the "Agriculture" sector, applicable to market risk management in the "Crop" and "Livestock" sectors in Bulgaria, covering the period 2007 - 2019, was collected from the State Fund Agriculture and Ministry of Agriculture, Food and Forestry annual reports (DFZ, Annual reports (https://www.dfz.bg/bg/za-dfz/annual-reports/, MAFF, Annual reports 2009 - 2020,).

The identification of the instruments intended for risk management within the entire package of agricultural policy measures was carried out based on the following criteria:

1) The tool is designed to support the management of risk situations, not to deal with constraint situations.

2) The financial support of agricultural holdings is limited to the amount of potential or actual losses from risky events. Depending on the stage of development of the risk that is affected, two mechanisms are possible to provide compensation for part of the losses of farmers, namely:

2.1) if the support takes place before the occurrence of the risk, it is implemented by stimulating risk management strategies at the "farm" level and thus helps to reduce the size of potential losses to farmers;

2.2) if the measure is intended to deal with the risk, it is implemented by means of income support, including lowering costs or increasing revenues to compensate for the damages incurred.

3) The legislative or legal acts by which the instrument was introduced define it as a risk/crisis management instrument.

Public financial support was presented as amounts in three main groups of public support instruments, grouped according to the purpose of their creation (Table 1), namely:

First group: Instruments for income support - this includes direct payments and state aid in the form of a discount on the value of excise duty on gas oil. Although by its economic nature and legal characteristics (Law on Excise Taxes and Tax Warehouses) indirect taxes (such as excise taxes) are not an element of income, the excise tax refunded to the farmer reduces the cost of production and thus affects the amount of the financial result. The political support techniques referred to this group are not designed to manage risk and the amount of support is not tailored to the level of risk faced by the individual agricultural holding - producers receive support both when the environmental conditions are unfavorable and when the results of their activity are not affected by random factors. Due to their relatively constant size, these payments can increase the stability of farmers' income. On the other hand, the security obtained may provoke risk-balancing behavior in them, demotivating them to invest in the implementation of their own market risk management strategies, such as various forms of diversification and cooperation.

Second group: Instruments for promoting investments in new technological processes - this group includes the investment measures under the Program for the Development of Rural Areas, as well as the state aid defined in the Guidelines of the European Union as Aid for the Development of Rural Areas and Other State Aid. Although the instruments in this group are also not designed to assist in risk management and the amount of assistance they provide is not commensurate with the level of uncertainty, they can indirectly limit risk if the following two conditions are simultaneously met: first, if the farmer chooses to invest in risk prevention or mitigation practices or technologies (e.g. investments in diversifying income sources or in production or marketing technologies that add value to products, or enhance contacts with certain groups of users, increase the degree of product distinctiveness or trust in producers); second, if as a result of the investment the farmer achieves a higher level of income stability and reduces his deviations in an undesirable direction.

Third group: Instruments designed to manage risk in agriculture - this includes payments under market support measures under the first pillar of the CAP (public intervention, private storage, and emergency measures).

Table 1. Market risk management instruments grouped according to the original purpose of their creation

Income support	Investment promotion	Risk Management
o Direct payments o State aid "Aid in the form of a discount on the value of excise duty on gas oil used in primary agricultural production"	**o Investment measures under the RDP** - Measures 112 "Establishment of farms of young farmers"; 121 "Modernization of agricultural holdings"; 123 "Adding value to agricultural and forest products"; 311 "Diversification to non-agricultural activities" of the RDP 2007-2013 - Measures 4.1 "Investments in agricultural holdings".; 4.2 Investments in processing/marketing of agricultural products.; 6.1 "Start-up aid for young farmers"; 6.3 "Start-up aid for the development of small farms"; 11 "Organic agriculture" and 14 "Humane treatment of animals" of the RDP 2014 - 2020 **State aid for the development of rural areas** - State aid "Assistance for the implementation of voluntarily undertaken commitments for the humane treatment of birds" - State aid "Assistance for the implementation of voluntarily undertaken commitments for the humane treatment of pigs" - "State aid for the participation of farmers in the Quality Scheme for the production of seeds and planting material" - State aid "Aid for investments in agricultural holdings through the concession of corporate tax" **Other types of state aid** - State aid for creating and maintaining a pedigree book &State aid for participation in exhibitions	**Market support measures** (public intervention, private storage and emergency measures)

Based on this grouping, the following indicators for the structure of public costs for the implementation of the market risk management policy in agriculture in Bulgaria were calculated: 1. share of income support costs - these are costs that have the potential to reduce the motivation of farmers to implement risk management strategies at the "farm" level; 2. share of investment promotion costs, i.e. expenditure on measures or schemes for investments in technology, some of which may limit the risk associated with the production or sale of agricultural products; 3. share of risk management costs ie. public expenditure on instruments created for the purpose of market risk management - calculated as the sum of payments for market support measures for agricultural producers (including public intervention, private storage and emergency measures).

A criterion proposed by Holzman et al. (2001) was used to classify risk management tools in terms of the stage of risk development that they aim to influence: 1) prevention tools that aim to

reduce the likelihood of the risk occurring; 2) to mitigate the negative effect in the event of the occurrence of the risk and 3) to deal with the risk after the occurrence of an undesirable event.

An assessment of the potential of the country's agricultural market risk management policy to encourage/disincentivize farmers to implement risk management strategies was carried out based on two criteria:

First criterion is the potential of risk management support to motivate farmers to proactively manage risk. The rationale behind this criterion stems from the assumption (Buckwell, A. et al., 2017) that when planning the means needed to limit their own losses, farmers take into account the support they would receive in the event of an adverse outcome. Hence, financial support for risk management, if not applied in balance with measures that incentivize risk management at the "farm" level, can limit private initiatives. The potential of risk management support to disincentivize farmers to proactively manage risk was assessed based on the ratio between the amount of financial resource allocated through instruments that motivate farmers to manage risk and the amount of risk management support. Aid is balanced if the cost of supporting farming efforts is equal to the cost of addressing the risk (i.e. if the value of the indicator is 1). The accepted limits for assessment under this criterion are the following: high potential < 1 (the amount of support to deal with the risk exceeds the support that aims to increase the activity of farmers in risk management); low potential ≥ 1 (amount of support to stimulate farmers' participation in risk management equals or exceeds support to address risk). The evaluation according to this criterion refers to the instruments designed for the purpose of market risk management.

Table 2. Indicators for assessing the potential of support to influence farmers' market risk management behavior

Formula	Variables
$Smpr=\frac{Mпр}{Pппр}*100$	**Smpr** - share (%) of support under instruments designed to stimulate farmers to manage market risk **Мпр**- costs intended to incentivize farmers to manage market risk before a risk event occurs **Рппр** - costs of instruments designed to manage market risk before a risk event occurs
$Cmpr=\frac{Mпр}{Спр}$	**Cmpr** - potential of market risk support to disincentivize risk management on farms **Спр**- amount of support to address market risk (payments under market support measures)

Second criterion is the potential of the complex of public instruments to demotivate market risk management at the "farm" level. This criterion is based on the understanding (Mathijs, E., 2017) that if the share of public expenditure is greater before the occurrence of a risk event (i.e. in prevention and mitigation) and lower in dealing with the consequences of the risk , this disincentivizes private financing of risk management mechanisms. The potential of the Agricultural Risk and Crisis Management Program toolkit to disincentivize farm-level risk management is assessed by comparing the cost of managing risk before a risk event occurs and the cost of post-event support. The distribution of costs is assessed as balanced if the amounts of public costs before and after the risk materialize are close in size (ie the value of the ratio is close to 1). The evaluation according to this criterion is in accordance with the following limits: low potential ≤ 1 (the amount of support to deal with the risk is equal to or exceeds the support before the occurrence of a risk

event); high potential > 1 (the amount of support after a risk has materialized is less than the support for managing risks that have not yet materialized). According to this criterion, the set of tools of the Program for the management of risks and crises in the "Agriculture" sector, designed for the management of economic risk in the "Crop and Livestock" sectors, was evaluated.

2. Results and discussion

The largest share (69% - 80%) in the structure of the funds paid out under the market risk management measures included in the Risk and Crisis Management Program in the "Agriculture" sector is occupied by those intended for income support (Fig. 1) . By its very nature, this support has the potential, on the one hand, to contribute to risk prevention and, on the other hand, to provoke risk-balancing behavior by disincentivizing farmers to take action to deal with market uncertainty. The share of costs that can indirectly support farmers' prevention efforts through investment in tangible and intangible assets is lower (30% - 20%). Payments for dealing with risk under market support measures take the smallest share in the structure of total costs (below 1%).

Support under instruments specifically designed for the purpose of risk management (market support measures) is intended in its entirety to address the risk. None of the mechanisms in this group incentivize farmers to implement market risk limiting activities themselves (e.g. public support for risk allocation or risk sharing does not take place in both periods).

Calculated across all Program instruments, including income and investment support, pre- and post-risk support is not balanced, and pre-risk support many times exceeds post-risk support. Thus, public support leaves no room for private initiatives related to market risk management.

Based on the performed analysis we draw the following conclusions*:*

First, the set of policy techniques included in the toolkit of the Agricultural Risk and Crisis Management Program can be grouped according to their original purpose and their potential to influence the behavior of farmers. One set of instruments has the potential to reduce farmers' incentives to sacrifice funds to limit market risk; another group can influence farmers' decisions to invest in risk prevention or mitigation practices, and a third group of techniques are designed to assist in risk/crisis management and have the potential to directly limit farmer income variability. The three groups of instruments are represented by a different share in the total amount of public expenditure to support agricultural holdings after 2007 and therefore may influence the risk management behavior of farmers to a different extent.

Second, the policy in the field of managing this type of risk in agriculture in Bulgaria has a high potential to compete with and displace private risk management strategies such as diversification, cooperation and pre-negotiation of prices and supplies. The basis for this conclusion is the large share of direct income support (69%-79%), which can provoke risk-balancing behavior - guaranteeing a certain level of income security limits farmers' incentives to invest in risk management.

Third, the schemes/measures that are designed to manage risk form less than 1% of the total amount of support and could therefore have a much more limited impact on the farmers' behavior.

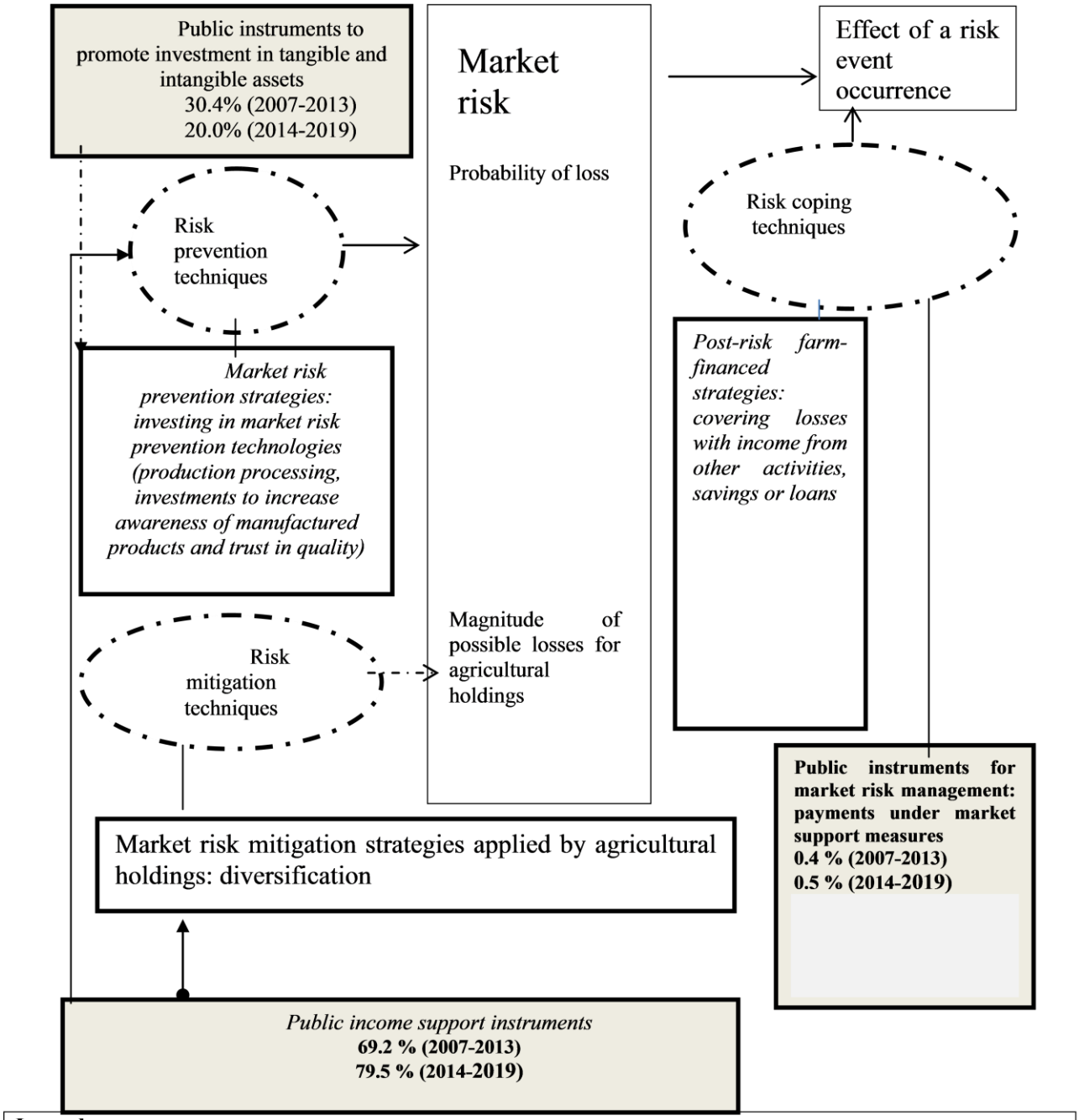

Figure 1. Market risk management in Bulgarian agriculture: cost structure of policy instruments for risk management, income, and investment support, 2007 - 2019 (%)

Fourthly, proactive management of market risk at farm level is not incentivized by any instrument put in place to support risk management and can be supported mainly through payments under investment promotion schemes and measures. The coping tools i.e. market support measures -

because they are not applied in balance with techniques that incentivize market participants to take risk-limiting actions, also have the potential to help crowd out private risk management initiatives.

Fifth, the ratio "support before the occurrence of a risk event / support after the occurrence of a risk" is unbalanced both in the group of instruments designed for the purpose of risk management, and in the general support under the toolkit of the Risk and Crisis Management Program in the Agriculture sector. It must be concluded that both the support under the measures that are specifically designed to help manage market risk, as well as the instruments included in the Program in general, limit the scope of farmers' responsibility for the variability of their income, which can be manifested in a weak adoption of market risk management strategies at farm level.

Conclusion

In conclusion, the market risk management support outlined by the Agricultural Risk and Crisis Management Program toolkit is, in its main part, support to overcome resource constraints and not an intervention aimed at compensating for existing uncertainty. Support before and after the occurrence of a risk event is not balanced and is realized in its main part as preliminary support, and not as support for overcoming catastrophic risks that have occurred. We should summarize that the potential of the studied complex of political instruments to demotivate the efforts of farmers to manage the market risk in agriculture in the Bulgaria is high.

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