

Bankassurance as financial instrument in agricultural risk management

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Summary: One of the very important problems in the agricultural production that existed for a long time is the risk from some weather adversity (hail, frost, flood, drought, storm, etc.), that is responsible for catastrophic consequences. On the other side, agricultural production is a specific area of business that is also strongly influenced by market, financial and institutional factors. These are all the dangers that do not depend on the will of man and his work, therefore it is necessary for farmers to recognize and predict the risks. There are different economic tools, which could be used to reduce the consequences from possible losses and bankassurance presents one of new products of risk management. It arises from the fact that there is need in agricultural production, through the provision of financial resources for the start of some production, also to provide simultaneously insurance against potential risks. Bankassurance is a financial instrument that integrates banking and insurance offer in the common financial market, and for farmers, this product is a combination of loans and insurance that can stabilize its revenues, but also to secure invested capital in the production. This paper presents the characteristics and advantages of bankassurance, i.e. the assignments of all three primary participants in this activity – the farmer, the bank and the insurance company. On the other side, a practical example of using bankassurance in agriculture is given and the specific advantages for farmers that are primarily connected with more favorable price of this new product are pointed out (simultaneously protects from several sources of risk - financial, production and market), but there is also additional security through the agricultural insurance.

Key words: agriculture, bankassurance, finance, insurance, risk management

Introduction

The total assets in agriculture are at high risk of natural and elementary events, as well as other risks. Due to climate changes it is likely that more temperature fluctuations will occur, as well as the pronounced oscillations in the amount of precipitation, which will increase the production risks in agriculture. In recent years, due to globalization and market

liberalization, inevitably there is an increase in the price risks that are being borne by farmers. At the same time, the increase in financial risk due to the increase in farmers' indebtedness has also been pronounced. Sources of risk are numerous, and from the point of view of the agricultural producer, the basic risks are related to the yield level, as well as the price of agricultural products.

A large number of authors have dealt with risks in agriculture, and as a general attitude they cite that the following sources of risk in agriculture can be systematized in general: production, financial, human, market and political risks (Barry, 1984; Hardaker et al., 1997; Vasiljevic et al., 2013; Markovic et al., 2018). Relying on the previous division, the most commonly mentioned risk types can be classified into two categories: internal risks (in farms) that are related to the production itself, its financing and the impact of human factors, as well as external risks (in the environment) which include the influence of market and politics (Ivanovic and Markovic, 2018).

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Risk mitigation includes measures that are applied for risk management, and they can be internal (avoidance of risk, diversification of production, creation of reserves, etc.) or external character (insurance, bilateral - forward contracts, forward contracts - commodity derivatives, etc.), depending whether they are available at the farm or provided by the side. What measures will be applied depends mostly on the owner of the farm, but they should be designed to influence the management of internal and external risks and to reduce their impact to an acceptable level.

In the past, individual measures managed individual risks in the most common case (e.g. protection from production risks was carried out by insuring production, protection from financial risks was carried out by subsidized loans with lower interest rates, bilateral forward contracts or forward contracts were used for the protection from the market risks, health insurance against sickness and farmers' injuries etc.). More recently, the tendency is to carry out protection against a greater number of risks with certain so-called package of products.

In agricultural production, there is a need to provide the possibility of simultaneously carrying out production insurance against potential risks, through the provision of financial resources for the start-up of some production, and this product is called bankassurance. For farmers, this market product is a combination of loan and insurance that can stabilize its revenues, but also insure capital investment in production. In this way, farmers are offered a "one-stop-shop" financial service, which saves time, commissions and costs (Krstic et al., 2011). The banking sector, striving for further geographical expansion and penetration in terms of increasing the number of clients in different segments, appears as a viable source suitable for the distribution of various insurance products (Neelamegam, Pushpa Veni, 2009). Lately, the distribution of insurance products through banks has steadily increased in many parts of the world (Teunissen, 2008). At the same time, bankassurance is the simplest way of distributing insurance products through the banking network (Choudhury et al., 2016). The uniqueness of such a product on the market can be manifested, for example, by combining loans for current assets (for purchasing inputs in production - seeds, fertilizers, fuels, etc.) and insurance in agriculture that most often covers the basic risk package (combined insurance against hail and a small number of other dangers - lightning, fire, etc.), but modern insurance models can also be included which, in addition to yields, will also insure the price of products, thus in addition to production and financial risks, will cover price risks too.

The aim of the research in this paper is to explain the characteristics and advantages of bankassurance from the theoretical aspect, as well as the tasks that are taken over by the three main stakeholders in this business - the agricultural producer, the bank and the

insurance company, as well as to present a practical example of using bankassurance in agriculture, the use of which can simultaneously protect farmers from multiple sources of risk.

Materials and Methods

For the realization of the set goal, the survey used the data of the individual farm from the Srem district (AP Vojvodina, Serbia), which deals with the production of basic crops (wheat, corn, sunflower), as well as the data of two financial institutions (banks and insurance companies) with which the farmer has many years of business cooperation.

The paper analyzes the possibility of applying bankassurance in the production of basic crops. In the first place, the advantages of this combined financial instrument are determined in relation to the individual demands of the farmer towards the bank (when providing funds for the purchase of necessary inputs when starting production of basic crops), that is, the insurance company (when providing crop insurance). Also, the total costs of potential procurement of this instrument are determined, as well as the benefits to farmers in the event a harmful event occurs. All calculations are done in the local currency (RSD), and the relation to the euro and the dollar is as follows: EUR 1 = 120 RSD, 1 USD = 100 RSD.

The cost of obtaining bankassurance is reflected in the calculation of the amount of funds that the farmer will return to the bank according to the appropriate method of calculating interest. If the proportional method of calculating the interest is taken into account, that monetary amount can be calculated through a loan amortization plan with equal annuities. Annuity (a) is calculated according to the general formula:

$$a = K \cdot r^{nm} \cdot (r-1) / r^{nm} - 1,$$

$$\text{wherein } r = 1 + p_m/100, p_m = p/12, n=1, m=12 \quad (1)$$

wherein:

K - loan amount (principal)

n - repayment period (year)

m - repayment dynamics (number of installments - months to be repaid in one year)

p - annual interest rate (%)

p_m - monthly interest rate (%)

Then interest is calculated in the first annuity (I_1), based on the following formula:

$$I_1 = K_1 \cdot p/100 \cdot m, \text{ wherein } K_1 = K \quad (2)$$

Below is the part of the annuity that is intended for repayment (O_1), where the interest in the first annuity is deducted from the annuity amount:

$$O_1 = a - I_1 \quad (3)$$

The rest of the debt in the second month (K_1) represents the difference between the initial balance of the debt and repayment in the first month, according to the formula below, and then the procedure continues for the remaining months according to the initiated procedure, which will be seen later in the results of the survey:

$$K_1 = K - O_1 \quad (4)$$

The amount of insurance represents the maximum amount of money covered by a particular insurance policy and serves as the basis for calculating the insurance premium. It is calculated as the product of average investments in the production of selected agricultural products per hectare (T_{pe}) and the number of hectares (F_v), and this amount is increased by 42.5% - which includes the estimated unpaid costs of harvest or harvest in the event of total damage, as well as the farmer's share in damage.

$$\Sigma S_v = T_{pe} \cdot F_v + 42,5\% \quad (5)$$

Insurance premium is calculated as a sum of insurance sum (ΣS_v) and premium rate (K_f), according to the following formula:

$$\Sigma K_v = \Sigma S_v \cdot K_f \quad (6)$$

In case of partial damage, the amount of indemnity is calculated as the percentage of damage (S_d) from the insurance sum, with the reduction of contracted share in damage (D):

$$\Sigma A_{vd} = \Sigma S_v \cdot S_d (\%) - D (\%) \quad (7)$$

In case of total damage, the amount of indemnity is calculated as the amount of the insurance sum reduced by the contracted share and the non-harvest costs of harvest (T_{nb}), which totals 30% of the deductions, based on the following formula:

$$\Sigma A_{vt} = \Sigma S_v - T_{nb} (\%) - D (\%) \quad (8)$$

According to the aforementioned calculations, the amounts of the bankassurance costs are obtained, as well as the total amount of the insurance premium, i.e. the amount of partial or total indemnity of farmer in the event of partial or total damage on the insured crops.

Research results

Bankassurance (credit with insurance) is a new product (financial instrument) that integrates the banking and insurance offer in the common financial market. Here, it is primarily intended to create and realize certain insurance products through the banking network. Bankassurance may include self-employed

insurance products sold through banks (e.g. voluntary pension insurance or life insurance), but also insurance products related to banking products (for example, insurance of production with a bank loan), as will be discussed in details below.

In the case of bankassurance, the farmer has two financial institutions - a bank and an insurer - in front of him, but the whole job is realized through the application for this product through the bank, with the note that the insurer is involved if a harmful event occurs and the need for damage assessment is reported. Since the amount of the loan is taken as the basis for calculating the amount of insurance, in the case of total damage, the same amount is returned to the farmer (only unrealized production costs and share in damage will be deducted).

Each of these financial institutions is in charge of appropriate activities, and accordingly, the functions of the bank consist in maintaining and developing a database of farmers as clients, marketing and selling products, training of loan officers on the sale, but also providing recommendations on conditions of insurance (insurance sum) since the sum of the loan, which is approximately at the level of the production costs of the farmers, i.e. the necessary investments in the current assets, is taken as the basis for the insurance sum. On the other hand, the insurer is responsible for the development of products from the part of insurance, it carries the risk and performs damage assessment and compensates the users of bankassurance, takes over the reinsurance function, and it can also market and sell the joint product.

The purpose of the existence of bankassurance in agriculture consists of the successful merging of interests of agricultural producers as clients, insurance companies and banks that are reflected in their individual advantages. The farmer receives the entire financial service in one place (through the bank), a more favorable price of the service (insurance premium contained within the interest rate), which simultaneously protects from several sources of risk (financial, production, and market), but also additional security through the insurance of its production (Table 1). In this way, the insurer reduces the costs of its own sales network and increases the number of farmers who are already banking clients. The bank is improving its services in agriculture by adding new products for insurance of crops, fruits and animals, simultaneously increasing the number of farmers, as users of services, and their loyalty to banks is increasing.

As the bankassurance shows certain advantages for farmers, which are primarily reflected in multiple production protection under more favorable conditions of risk transfer, it is certain that the combination of two different financial institutions may also have some disadvantages that adversely affect users. They are reflected in the fact that the concentration of the entire financial risk is in one place, that there is a lack of

confidence in the knowledge of the banking officer in the field of insurance, as well as the mistrust that the incorporated organizations can fully meet the individual needs of the farmers as a service user, so that the dissatisfied user return to traditional production insurance for that reason (Table 1).

Therefore, for the successful functioning of the banking system it is important that the procedures for the operation of banks and insurance companies must be tailored to each other. One of the key factors for the success of bankassurance is the high quality cooperation between two heterogeneous information systems (banks and insurers), which can positively affect farmers, as potential users of this new financial product.

The example of bankassurance function will be given on the case of an individual farmer from Srem district who is engaged in the production of basic crops (wheat, corn and sunflower) on 20 ha. The farmer's decision is to finance production from a bank loan with free insurance of crops. Given that average investments in the production of these crops are at the level of 50,000 RSD/ha, it takes a short-term loan in the

amount of 1,000,000 RSD for the purchase of necessary inputs in production. The loan repayment period is one year in 12 monthly installments, and the annual interest rate is 9%. The total production, according to the formula (5), is insured on the total insurance sum of 1,425,000 RSD (71,250 RSD/ha), with the share in the damage of 10%. Based on the preliminary data, it is necessary to determine:

- The amount of funds that the farmer will return to the bank according to the proportional method of calculating interest;
- The amount of the premium per hectare (premium rate of 2.5%) and the share of the premium in the monthly loan installment;
- The amount of partial damages per 5 hectares of land, due to potential damage from the hail in the amount of 40%;
- The amount of total damages per 10 hectares of land, due to potential damage from the hail in the amount of 100%.

Table 1. Advantages and disadvantages of bankassurance for farmers

Advantages	Disadvantages
* The entire financial service in one place (simpler procedure)	* Concentration of total financial risk in one place
* Better service price (insurance premium included in interest rate)	* A lack of confidence in the knowledge of a banking officer in the field of insurance
* Protection against a large number of risks	* The lack of confidence that the incorporated organizations meet the individual requirements of the farmer
* Production security	

Source: Munich Re Group, 2001; Pavlović, 2004

Table 2. Plan for repayment of short-term loans for the purchase of inputs

Installment	Loan status (RSD)	Interest (RSD)	Repayment (RSD)	Annuity (RSD)
0	1,000,000.00			
1	920,048.52	7,500.00	79,951.48	87,451.48
2	839,497.41	6,900.36	80,551.11	87,451.48
3	758,342.16	6,296.23	81,155.25	87,451.48
4	676,578.25	5,687.57	81,763.91	87,451.48
5	594,201.11	5,074.34	82,377.14	87,451.48
6	511,206.15	4,456.51	82,994.97	87,451.48
7	427,588.71	3,834.05	83,617.43	87,451.48
8	343,344.15	3,206.92	84,244.56	87,451.48
9	258,467.76	2,575.08	84,876.40	87,451.48
10	172,954.79	1,938.51	85,512.97	87,451.48
11	86,800.47	1,297.16	86,154.32	87,451.48
12	0.00	651.00	86,800.47	87,451.48
Total	-	49,417.72	1,000,000.00	1,049,417.72

Source: Authors' calculations

Table 3. Calculation of insurance premium and indemnity

Insurance sum (RSD)	Insurance premium (RSD)	Partial indemnity (RSD)	Total indemnity (RSD)
*1,425,000	**21,375	***128,250	****498,750

Source: Authors' calculations

* 20 ha · 50,000 RSD/ha + 42.5%

** 1,425,000 · 2.5% · 60%

*** 1,425,000/4 · 40% - 10% (partial indemnity for 5ha area)

**** 1,425,000/2 - 20% - 10% (total indemnity for 10ha area)

The amount of cash that the farmer must return to the bank can be calculated through a loan amortization plan with equal annuities. Annuity (a) is 87,451.48 RSD, and is obtained based on formula (1) if the previously given data is included. According to formula (2) interest in the first annuity is 7,500 RSD. The part of the annuity paid for repayment (79,951.48 RSD) is calculated according to formula (3), while the amount of the remainder of the debt in the second month is 920,048.52 RSD, and is obtained according to the formula (4).

Furthermore, the procedure continues according to the given procedure, so the loan repayment plan can be seen in the given Table 2, and accordingly the farmer should return the bank to a short-term loan increased by 49,417.72 RSD, which totals 1,049,417.72 RSD.

Since the insurance sum is 1,425,000 RSD, based on the premium rate of 2.5%, the total premium amount is 35,625 RSD ($1,425,000 \cdot 0.025$), and the premium per hectare is 1,781.25 RSD (35,625 RSD/20 ha). Given that the farmer has the possibility of subsidizing the premium in the amount of 40%, in that case the farmer's premium is 1,068.75 RSD/ha ($1,781.25 \cdot 0.6$). Bearing in mind the amount of monthly installments (RSD 87,451.78) and the monthly premium of 2,968.75 RSD (35.625 RSD / 12), the participation of the premium of 3.39% in the monthly burden of farmer with loan installment is recorded.

In case of the partial damage, the amount of indemnity received is 128,250 RSD, and it is calculated according to the formula (7). On the other hand, in case of total damage in one part of the area (10 ha), the compensation is 498,750 RSD, according to the formula (8), and everything is presented in Table 3.

It is certain that in this way the farmer can provide relatively favorable funds for the successful realization of sowing and the production of basic crops, but on the other hand he has guaranteed protection against certain sources of risk.

Conclusions

It is very important for every farmer to take into account the risks that affect the farm itself (internal risks), which are primarily related to the risks associated with the agricultural production itself, its financing, and the impact of the human factor. On the other hand, it is necessary to notice the risks arising from the environment (external risks), which are basically related to the influence of the market, as well as some decisions of an institutional character, that is, the ones that are subject to political influences. In addition to the fact that is very important to every farmer to recognize and anticipate risks, on the other

hand, it is extremely important to implement appropriate risk management.

Bankassurance is a protection against financial risks by borrowing money from the bank, but also the protection from production risks through production insurance. Price risk protection may also be included in this package if an appropriate insurance model is applied which, in addition to loss of yield, also protects from the change in prices of agricultural products. The basic advantage of this financial instrument for farmers is reflected in multiple production protection under relatively more favorable conditions of risk transfer (insurance premiums included in interest rates, as well as indemnity for partial or total damage to crops).

Based on all previous considerations, it is certain that bankassurance can be an important measure for reducing financial and other business risks in the future. However, due to the complexity of the joint work of the two financial institutions, as well as the relatively complicated budgeting procedures, it is necessary to bring this product closer to agricultural producers.

References

- Akhverdov A A, Mirzoeva N V (1949): The experience of wild herbaceous plants collecting, keeping and planting in the Yerevan Botanical Garden of Academy of Sciences of Arm SSR. *Bull. Bot. Sada Akad. Nauk Arm SSR* 8: 37-45.
- Barry, J.P. (1984). *Risk Management in Agriculture*, First Edition. Iowa State University Press, Ames, Iowa.
- Choudhury, M., Singh, R., & Saikia, H. (2016). Measuring Customer Experience in Bankassurance: An Empirical Study. *Market-Tržište*, 28 (1): 47-62.
- Hardaker, J.B., Huime, R.B.M., & Anderson, J.R. (1997). *Coping With Risk in Agriculture*. Cab International, Wallingford.
- Ivanović, S., & Marković, T. (2018). *Upravljanje investicijama u agrobiznisu* (Investment Management in Agrobusiness). University of Belgrade, Faculty of Agriculture, Belgrade - Zemun.
- Krstić, B., Vojvodić-Miljković, N., & Mandić, D. (2011). Bankassurance – New Options for the Development of Serbian Financial Sector. *Facta Universitatis, Series: Economics and Organization*, 8(1): 15-29.
- Marković, T., Veselinović, J., & Kokot, Ž. (2018). Economic and Legal Aspects of Sunflower Insurance Using the Model of Regional Index. *Economics of Agriculture*, 65(1): 215-228.
- Munich Re Group (2001): *Bankassurance in Practice*. Available at: <http://docslide.us/documents/bancassurance-in-practice.html>
- Neelamegam, R., & Veni Pushpa, K. (2009). Bankassurance - An Emerging Trend in Indian Service Sector. *Indian Journal of Marketing*, 39(10): 49-54.
- Pavlović, B. (2005). *Bankassurance and Mortgage Linked Insurance Example*. Delta Osiguranje a.d., Beograd.
- Teunissen, M. (2008). Bankassurance: Tapping into the Banking Strength. *The Geneva Papers on Risk and Insurance*, 33(3): 408-417.
- Vasiljević Z., Zarić, V., & Šević D. (2013). Insurance in Agriculture of Serbia as Precondition of Risk Minimization. *Proceedings of the Seminar „Agriculture and Rural Development - Challenges of Transition and Integration Processes“*, University of Belgrade, Faculty of Agriculture, Belgrade-Zemun.

Bankoosiguranje kao finansijski instrument u upravljanju rizicima u poljoprivredi

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Sažetak: Značajan problem u poljoprivrednoj proizvodnji od davnina predstavlja rizik od nastupanja nekog štetnog događaja (grad, mraz, poplava, suša, oluja itd.), koji izaziva katastrofalne posledice. Sa druge strane, poljoprivredna proizvodnja predstavlja specifičnu oblast poslovanja na koju snažno dejstvo takođe imaju i tržišni, finansijski i institucionalni faktori. To su sve opasnosti koje ne zavise od volje čoveka i njegovog rada, te je poljoprivredniku neophodno da prepozna i predviđa rizike. Za smanjenje i otklanjanje posledica od mogućih gubitaka u proizvodnji koriste se razne ekonomske mere, a bankoosiguranje predstavlja jedan od novih proizvoda za upravljanje rizicima. To proizilazi iz činjenice da se u poljoprivrednoj proizvodnji javlja potreba da se kroz obezbeđivanje finansijskih sredstava za pokretanje neke proizvodnje, stvori mogućnost da se istovremeno vrši i njeno osiguranje od potencijalnih rizika. Bankoosiguranje (kredit sa osiguranjem) predstavlja finansijski instrument kojim se integriše bankarska i osiguravajuća ponuda na zajedničkom finansijskom tržištu, a za poljoprivrednika ovaj tržišni proizvod predstavlja kombinaciju kredita i osiguranja kojim on može da stabilizuje svoje prihode, ali i da osigura uloženi kapital u proizvodnju. Autori ovoga rada sa teorijskog aspekta objašnjavaju karakteristike i prednosti bankoosiguranja, kao i zadatke koje preuzimaju tri osnovna učesnika u ovom poslu – poljoprivredni proizvođač, banka i osiguravajuća kuća. Sa druge strane, daje se praktičan primer korišćenja bankoosiguranja u poljoprivredi i ukazuje na konkretne prednosti koje imaju poljoprivrednici, a koje se prevashodno ogledaju kroz povoljniju cenu usluge kojom se istovremeno štite od više izvora rizika (finansijskih, proizvodnih i tržišnih), ali i dodatnu sigurnost kroz osiguranje svoje proizvodnje.

Ključne reči: poljoprivreda, bankoosiguranje, finansije, osiguranje, upravljanje rizicima

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