
CROP RECEIPTS AS ALTERNATIVE FINANCIAL INSTRUMENTS

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ABSTRACT

The aim of the paper is to provide insights into the lending against crop receipts mechanism. Crop receipts emerged as promising financial instruments creating an additional type of collateral for agricultural producers that pledge their future agricultural production in order to finance ongoing production activities. At the same time, they offer an alternative investment opportunity to banks through the creation of a new asset class. European Bank for Reconstruction and Development supported Serbia in establishing a crop receipt system with the aim to serve as a pilot project for Europe. This is the first analysis of the crop receipts system in Serbia. The methodology applied consists of interviews with bank representatives, extensive literature research, descriptive statistics and comparative analyses. Results are indicating that the main shortcomings in the crop receipts system include the lack of specialised shareholders' knowledge, the absence of subsidization of interest rates on loans against crop receipts followed by the lack of appropriate Central bank policy, standardization and securitization

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Introduction

The major obstacle for agricultural producers may be found in capital constraints caused by limited credit access which hinder investments in production, implementation of modern technologies, farmers' literacy, etc. (Trzeciak-Duval, 2003; Popović et al., 2018). The main characteristic of agricultural financing is the time discrepancy between investments and expected revenue due to the long production period. Producers need

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funds for the next growing season and loans can be repaid at the harvest time. The timely access to credit enables them to start adequate investments resulting in improvement in production and profitability (Asante-Addo et al., 2017; Iftikhar & Mahmood, 2017; Pantić et al., 2021; Owusu, 2017; Saqib et al., 2018; Kong et al., 2020).

Crop receipts emerged as alternative instruments in agricultural financing. There are other terms used for crops receipts, such as future crop receipts, pre-harvest financing instruments and agrarian receipts. Crop contracts are often named pre-harvest financing instruments because future crops during the production process are pledged, whereas warehouse receipts are named post-harvest financial instruments where stored commodities are serving as loan collateral (Kovačević et al., 2016; Miranda et al., 2019).

A crop receipt is a document issued by an agricultural producer or cooperative to deliver a certain quantity of an agricultural commodity or to repay a certain amount of money at a future date. Crop receipts exist in two forms – crop receipts with physical or cash settlement. Based on this instrument, the lender provides a certain amount of money or inputs that are to be settled upon crop receipt maturity. The lenders for delivery-based crop receipts may be processors or input suppliers, while for financial settlement-based crop receipts the lenders are banks (Gonçalves et al., 2005).

In the situation of physical settlement, the producer is obliged to deliver certain products at the arranged place of delivery on the maturity date. Financial crop receipts result in financial settlements upon maturity (agricultural product is only the collateral).

Having out-of-court dispute resolution, crop receipts guarantee rapid execution in case of non-performance or breach of contract on the part of the crop receipt issuer, providing low-risk environment for lenders (Hollinger et al., 2019).

The most important attribute of crop receipts is the reduction of risks for the buyers. In general terms, the main objectives of the pre-harvest financing are to:

- 1) finance production with future crops as collateral;
- 2) guarantee the supply of agricultural products;
- 3) provide alternative investments for lenders.

Scientific research in the field of pre-harvest financing is limited. The analysis of the crop receipts is constrained by the lack of data. This lack of data is the result of the co-existence of many crop receipts registers for different assets. As a result, a small percentage of crop receipts are centrally registered - the ones to be traded on secondary markets.

This article fills the gap in scientific research of crop receipts' fundamentals. The analysis is based on the analysis of the only three, up to the present moment, established pre-harvest financing systems in the world. In addition, this is the first comprehensive analysis of the Serbian pre-harvest system as the sole pilot project for the European area.

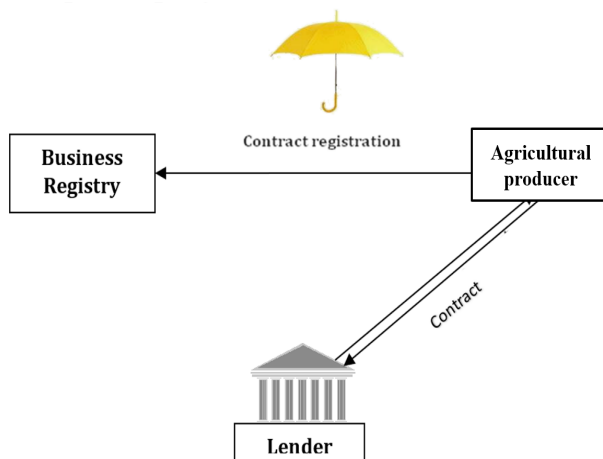
Overview of the existing pre-harvest financing systems

This part of the paper provides an overview of the only three pre-harvest systems in the world established up to the present moment – Brazilian, Serbian and Ukrainian.

The annual investments requirements of agriculture in Brazil in financial terms reach about USD 149 billion, 40 percent of which is provided by the crop receipts (FAO, 2011). Physical delivery-based crop receipts are introduced in Brazil by the Law on ‘Note of Agricultural Product’ in 1994, which established the Certificate (or Note) of Agricultural Product (Cédula de Produto Rural). The financial crop receipts are introduced in 2001. Initially were introduced crop receipts were with the physical settlement, while years later financial settlement crop receipts emerged. Based on the crop receipts secondary financial instruments have been created as pre-harvest instruments through the securitization process (Leão de Sousa & Pimentel, 2005; Ministry of Agriculture, Livestock and Food Supply Brazil, 2010; Hollinger et al., 2019; Vujović & Vujović, 2021).

The crop receipts in Serbia are introduced in 2014, by the Law on financing and Securing Financing of Agricultural Production. The Serbian crop receipt system was aimed to be a pilot project for Europe supported by the European Bank for Reconstruction and Development (EBRD) and the FAO providing technical support in drafting and implementation. Figure 1 presents the crop receipt system in Serbia.

Figure 1. Crop receipt system in Serbia



Source: Authors' presentation

The crop receipts in Serbia are based on the continental legal system as a contractual obligation. The crop receipts are registered in the Business Registers Agency (BRA), which serves as the central record of crop receipts preventing to use the future crops from the same plot as collateral more than once. With the support of the EBRD, the electronic record of pre-harvest financing agreements was introduced in 2015 and it is publicly

available. The Law defines, as in the other two systems, the mandatory information that each contract must contain. Legislatively facilitated out-of-court enforcement in the event of non-performance of contracts by farmers has also been established.

The crop receipt system was introduced in Ukraine by a pilot project in 2011 and in 2013 a Law on agrarian receipts was enacted (Andriievskiy et al., 2012; Starodubtsev & Bakai, 2020). Despite high expectations, that in the medium run crop receipts will be able to provide at least USD 1.5 billion in additional loans, the crop receipt system in Ukraine significantly underperformed (Polyarush, 2018). As in Serbia, the continental legislative framework has been applied resulting in the pre-harvest instrument in the form of a contract. Ukraine crop receipts are secured by the pledge of future crops from a particular land plot and creditors receive a priority for enforcement (Sokolska et al., 2020). Crop receipts are registered by notaries, making them publicly visible (Radchenko, 2013). Creditors have the right to monitor the processes of future crops production and interrupt possible breaches of agreed procedures by the debtors (Stender, 2017).

Materials and methods

The analysis is based on the survey of the accomplished results of the establishment of the pre-harvest system in Serbia and a comparative analysis of the Brazilian, Ukrainian and Serbian systems.

Based on the comparative analysis of the existing pre-harvest systems core milestones are identified and compared.

To provide objective results, the following methods were used in the paper:

- Questionnaire to commercial bank representatives;
- Descriptive statistics;
- Comparative analyses.

The questionnaire for licensed commercial banks' representatives in Serbia was aimed to provide insights into their attitudes related to lending against crop receipts. All licensed commercial banks were interviewed – a total of 33 banks (National Bank of Serbia, 2021), while 21 banks responded to the questionnaire. The survey was conducted between January 15th and January 28th 2021.

Besides the questionnaire, the data sources for the analysis included the Business Registers Agency of the Republic of Serbia (BRA), the Statistical Office of the Republic of Serbia (SORS) and the Ministry of the Agriculture, Forestry and Water Management of the Republic of Serbia (MAFWM).

Results

Serbian crop receipt system underperformed expectations. Hereunder are analysed numbers of contracts and loan values.

Table 1 presents the results of crop receipts financing in Serbia.

Table 1. Total value and number of crop receipts on annual basis in the period 2015-2020

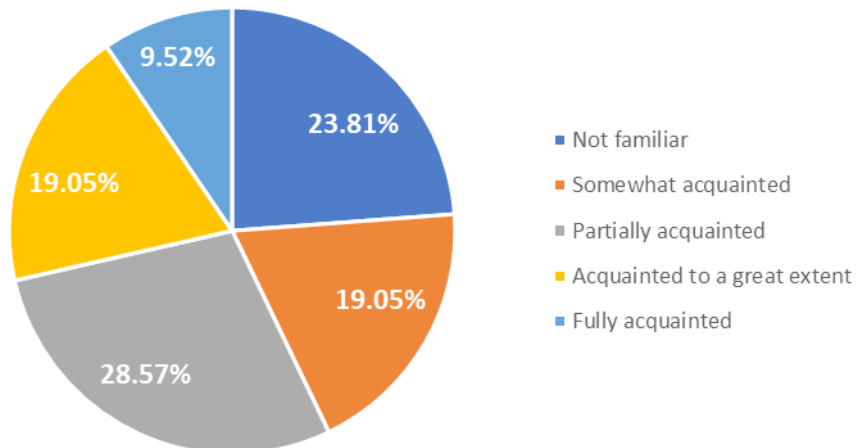
Year	Total value (EUR)	Total number of contracts
2015	2 001 742	50
2016	39 860	2
2017	316 902	3
2018	186 001	4
2019	128 343	4
2020	776 436	30
Average	574 881	13.28
St.dev.	745 651.41	20.02

Source: Authors' calculation based on BRA (2021)

What can be noticed is significant variation in total value and number of contracts over years. In the initial year value was EUR 2 001 742 and the number of contracts was 50, the highest compared to other years due to the decision to use crop receipts of the one large processor, the sugar refinery, which significantly affected crop receipts results. Significant volatility and small volume of crop receipts characterized crop receipts results in the whole period.

In continuation are presented results of the interviews with relevant bank representatives related to the lending against crop receipts. Figure 2 presents respondents' attitudes toward the level of literacy related to the pre-harvest system.

Figure 2. Answers to the question: Are you familiar with additional loan security through the pre-harvest financing system?



Source: Authors' presentation of survey results

According to the results of the analysis, around 28% of respondents have significant or full knowledge on lending against warehouse receipts.

The importance of public policies for the development of pre-harvest financing was further analysed (Table 2). The respondents could rank the stated policy tool by using a scale from 1-5 where 1 stands for Not significant, while 5 stands for Very significant.

Table 2. Assessment of the public policies' effect on the pre-harvest financing

Rating*	A number of answers to the statement: Standardization of the pre-harvest financing agreements, securitization and secondary trading would affect the development of the pre-harvest system financing.	A number of answers to the statement: The decision of the National Bank of Serbia on adequate rating for the pre-harvest financing would affect the development of the pre-harvest financing.	A number of answers to the statement: Subsidizing the interest rate for loans based on the agreement on pre-harvest financing would affect the development of the pre-harvest financing.
5	11	15	17
4	4	2	2
3	2	2	1
2	3	2	0
1	1	0	1
Average	4.1652	4.2228	4.4296
St.dev.	1.3038	1.0282	1.1650

Source: Authors' presentation of survey results

Bank representatives assessed that interest rate subsidies for loans based on the agreement on pre-harvest financing represent the most important tool for the development of the pre-harvest financing in Serbia. The second important tool is the rating system of the Central bank which is seen as useful for scaling up lending against crop receipts. As third, but still significant, is seen the standardization of the pre-harvest financing agreements, securitization and secondary trading that would be of high importance for the development of the pre-harvest financing system.

Discussions

After six years of functioning of the crop receipts system in Serbia, the analysis of the results was conducted. Based on the results, measures have been proposed to improve the crop receipts system for the farmers, agricultural policymakers, financial institutions and the National Bank of Serbia. A comparative analysis of the Brazilian and Ukrainian crop receipt systems was conducted in order to draw conclusions and recommendations.

Sixteen core elements for the crop receipt system are recognized and analysed.

1) Legal status of the pre-harvest financing instruments differs so that, based on the Anglo-Saxon legal system in Brazil it is security - Promissory note, while in Ukraine and Serbia, based on the continental legal system it is a bilateral contractual agreement. Starodubtsev & Bakai (2020) recognized the need for Ukrainian crop receipts to be

converted into financial instruments in order to facilitate loan provision and secondary trading. Analysis in this paper is aligned with previous ones, stressing the need for the legal framework for the crop receipts as standardized debt instruments rather than individual contracts.

2) Agricultural holding size, given that lenders are not interested in small size of crop receipts. Compared to the Brazilian and Ukrainian systems where large holdings are dominating, with an average size of just 5.4 ha (SORS, 2012) Serbia has unfavourable agricultural holding structure for crop receipts' growth. As small crop receipts are not attractive for financiers, aggregation of crop receipts throughout cooperatives is essential. For the development of the crop receipt system in Serbia and most developing countries, a different approach is needed – to build scale through cooperatives aggregation.

3) Crop receipt elements represent the minimum elements that each pre-harvest financing certificate must have and are defined in all three systems.

4) Crop receipt form is defined as a standardized document only in Brazil, while in Serbia and Ukraine it is a contractual obligation and there is no standardization. Brazilian crop receipt form is an important step toward standardization and crop receipts secondary trading. A good example of commodity receipts can be found in Serbia where the warehouse receipt form is printed by the National Bank of Serbia (The Law on Public Warehouses “Official Gazette of RS”, No. 46/2006). As a consequence, warehouse receipts in Serbia are easy to pledge, transfer pledge and trade. Based on the conducted research, the introduction of a standardized form of these financial instruments can be recommended for the development of an efficient crop receipt financing system.

5) Eligible agricultural products, in the case of Brazilian and Ukrainian pre-harvest financing instruments all agricultural products are eligible. In Serbia, pre-harvest financing agreements are limited to plant-based agricultural products. Since plant production takes place on a certain plot, pre-harvest financing is less risky in relation to the financing of livestock production, so the Serbian model can be recommended as a first step in crop receipt system development.

6) Crop receipts record is established in all three systems. The Register of Contracts on Financing Agricultural Production in Serbia started operating within the Business Registers Agency on June 1, 2015, and represents a unique, central, public and electronic database on concluded financing agreements, as well as the documents on the basis of which the registration was performed (BRA, 2021). The Serbian software necessary for the operation of the Register was developed within the technical assistance project of the Food and Agriculture Organization of the United Nations (FAO) and the EBRD. The central record of pre-harvest financial instruments is of great importance since it provides additional security for the contract execution, i.e., a potential financier of agricultural production can inspect the central database and see if the product from that plot has already been pledged, which prevents the possibility that the future product from the same plot will be pledged several times. It can be concluded that for the efficient pre-harvest financing it is important to establish: (1) reliable electronic central

record of all crop receipts (2) enrolment and data change need to be easy with low costs (3) transparency and visibility of data to all stakeholders in real-time and (4) connectivity to OTC market, commodity exchanges, etc. The central register of crop receipts in Serbia can be a positive example since Brazil has no central registry for all pre-harvest instruments resulting in lower transparency. The Register of crop receipts is a unified information system in Ukraine but according to Starodubtsev and Bakai (2020) there is a need for its transformation into electronic form.

7) Enforcement procedure in the case of default. None of the conditions above would suffice in case the instrument does not work in a default context. In all three pre-harvest systems there is an efficient out-of-court enforcement procedure in place. Starodubtsev and Bakai (2020) are stressing out the need for improving enforcement procedure for crop receipts where the transfer of pledged assets to the domestic lender is in place while the legislation needs to allow transfer to non-residents by customs clearance of goods for movement across the state border.

8) Additional mechanisms to increase the security of contract execution in the form of additional sanctions for non-performance of contracts are found in all three systems. In the Ukrainian system, that is the possibility of criminal liability for an unscrupulous debtor. A very interesting model that works successfully and that could be recommended to all other pre-harvest systems is in Serbia where in case of non-performance of the contract the producer is excluded from the system of government subsidies during a certain period.

9) Force majeure events, in the Serbian system producers are protected in the case of adverse events (adverse weather conditions, fire, floods, etc.) with the possibility to transfer the obligation to the next production period. Although this is important for producers, it could not be recommended because it raises the question of who and how will determine the occurrence of adverse conditions and also limits the possibility of standardization and secondary trade of pre-harvest instruments.

10) Agricultural insurance of products under crop receipt is mandatory in the Brazilian system while optional in the Ukrainian and Serbian. The Brazilian system can be an example as the insurance obligation leads to standardization and the possibility of securitization and secondary trading of crop receipts.

11) Future crop valuation is an important issue for the functioning of pre-harvest financing. It is the valuation of the products under crop receipts as the maturity date is in the future. Brazil is the only country with an established liquid commodity derivatives market, which allows valuation of the crop receipts at the time of issuance. Also, the derivative market is allowing hedging as the crop receipts can be used to meet the initial margin on a futures position.

12) Commodity exchange crop receipts primary issuance and secondary trade. Brazil is the sole country with developed primary issuance of the crop receipts at the commodity exchange and deep crop receipts secondary market. It can be assessed that secondary

trading of crop receipts is of great importance for attracting investors. On the other hand, trading enables producers to take their crop receipts to the commodity exchange auction and get the most favourable financing conditions. Based on the Brazilian experience it can be recommended that standardization of crop receipts is a necessary precondition for secondary trade. Similar results are derived from the Starodubtsev and Bakai (2020) research highlighting the importance of amending Ukraine legislation to recognize crop receipts as a security in order to establish an exchange and over-the-counter trading.

13) Crop receipts securitization. Among the surveyed countries Brazil is the only country with a significant level of crop receipts uniformity. Securitization and the possibility for trade with this financial instrument is an important part of the Brazilian pre-harvest system's success.

14) Tax incentives are very important, making the investment in pre-harvest instruments more attractive to creditors. Only Brazilian crop receipts investors are granted income tax reliefs. No tax reliefs were introduced in the Ukrainian and Serbian systems. The tax relief in the Brazilian experience has proven to be very important in facilitating the secondary trade of crop receipts and can be recommended.

15) Central bank role. Each central bank determines the rating of loans based on the level of risk they carry. Central bank favourable rating results have several effects. The first is "cheaper" credit because the commercial bank, in the case of a better rating, has the obligation to make a smaller deposit with the central bank. Another effect is the increase of the overall trust in these instruments since a better rating sends a positive signal that pre-harvest financing instruments are secure collateral. In Brazil, a favourable rating has been established for pre-harvest financing instruments. A positive example can be found in Serbia where the National Bank of Serbia in 2011 determined a favourable rating for loans against warehouse receipts, positively affecting the volume of lending and lending conditions (Kovačević et al., 2021).

16) Other supports were found in the Brazilian system where the interest rate for loans against crop receipts is subsidized, while in Serbia and Ukraine such support measures have not been implemented. The practice has shown that the introduction of an interest rate subsidy is of great importance. The importance of introducing this measure was also shown in Serbian practice where EBRD in 2011 through a risk share program via three commercial banks invested EUR 50 million to support loans against warehouse receipts (Zakić et al., 2014)

Conclusions

Chronic lack of funds in financing agricultural production is one of the most important limiting factors for the development of the agribusiness sector. In order to solve this problem Brazil, Ukraine and Serbia have introduced pre-harvest financing systems as a vehicle for more efficient agricultural financing.

It can be concluded that the Serbian crop receipt system fell short of the expectations. A small number and value of the crop receipts were issued. The findings are suggesting the milestones that need to be reached for development of the pre-harvest financing among which the most important are: promotion and education, crop receipt standardization, scaling of the volume and the size of the crop receipts, central banks' favourable rating for loans against crop receipts, subsidizing the interest rates, tax incentives for investors in crop receipts, etc.

It can be concluded that crop receipts are promising financial instruments, in particular for developing countries, where producers have difficulties accessing the credit market. Lessons learned during the first six years of the European pilot project of the EBRD in developing crop receipt system in Serbia are valuable for improving the Serbian system as well as for the countries aiming to establish alternative pre-harvest financing in agriculture.

The most significant limitation of the analysis of pre-harvest financing lies in the lack of systematized data and scientific research in this area. Systemized and publicly available data on pre-harvest agricultural financing would create a solid ground for future research in this area.

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Conflict of interests

The authors declare no conflict of interest.

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