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# LENDING AGAINST WAREHOUSE RECEIPTS - EVIDENCE FROM SERBIA

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## ARTICLE INFO

Original Article

Received: 28 February 2021

Accepted: 25 May 2021

doi:10.5937/ekoPolj2102341K

UDC 336.581.2:338.43(497.11)

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### Keywords:

*warehouse receipts, public warehouses, agricultural loans, indemnity fund*

**JEL:** G23, Q14

## ABSTRACT

The paper examines factors influencing development of the public warehouse system. Public warehouse system primary role is to provide stakeholders in agribusiness financing against stored commodity as collateral. Case study is conducted in Serbia. Interviews with banks, analyses of the public warehouse results, computational analyses and intensive literature research were conducted. Most important factors for lending against warehouse receipts from bankers' perspectives are guarantee system performances followed by efficient enforcement procedure, efficient public warehouse surveillance, favourable central bank's rating of warehouse receipts and subsidies. According to the results, Serbian public warehouse legal framework is properly established resulting in fast development of the public warehouse system in first years. After 2014 system deteriorated primarily due to the absence of inspection and Indemnity fund low guarantee performance. Lessons learned from Serbia point out that besides proper legal framework, implementation and favourable business environment are paramount for successful public warehouse system.

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## Introduction

The paper aims to present the principles on which public warehouse systems are based, lending against warehouse receipts mechanics and prerequisites for well-established public warehouses.

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The main limitation of agricultural production is the chronic shortage of financing. Agricultural producers are often lacking adequate collateral to secure loans. (Muhović et al., 2019; Popović et al., 2018).

Lending against warehouse receipts is based on the securely stored commodity as short term loan collateral often referred as “inventory credit”. Warehouse receipt is important financial instrument for farmers, traders, processors and other agribusiness stakeholders. Warehouse receipts are documents issued by the public warehouses proving ownership of stored commodity of a particular quantity and quality in a public warehouse. Warehouse receipts are commonly used as collateral for financial institutions loans (IFC/WB, 2013; Jovičić et al., 2014; Grbić & Jovanović, 2020). The pledge on stored commodities is important path for overcoming collateral constraints in agricultural sector (Höllinger, Lamon, 2009).

Most common definition of public warehouses is the following that states that public warehouse is “a platform that enables farmers, traders, processors, and exporters to obtain finance secured by agricultural commodities deposited in a warehouse” (FRMA, 2020).

Trade and financing based on the stored commodity go back to Ancient Mesopotamia. Modern public warehouse system emerged in the United States with the introduction of legal framework in 1913, with the first warehousing law, made it possible for warehouse receipt finance to be generalised and expanded. The USA’s public warehouse system is followed by Latin America and later China, Eastern Europe, the former Soviet Union and India (Coulter, Onumah, 2002; UNCTAD, 2009).

Warehouse receipt financing is allowing farmers to postpone selling of commodity after the harvest, when the price is usually the lowest. Farmers have the opportunity to store their products in public warehouses and to meet their short-term financial needs with loans that have a commodity record as collateral. Later, during the period of the year when the price is higher, agricultural producers can sell their products and settle their obligations on the basis of short-term loans taken. Lending against warehouse receipts has positive macroeconomic effect by levelling supply and demand throughout longer period and decreasing commodity price volatility.

Secondly, the warehouse receipts contribute to improving the efficiency and transparency of commodity marketing. Warehouse receipts are easily transferable by merely endorsing it to the new holder. Same reasons causing bank to lend against are the motive for traders to purchase warehouse receipts – there is no risk that stored commodity in public warehouse would be unavailable to the warehouse receipt owner. Warehouse receipts are providing safe trading in commodity with a special importance on commodity exchanges where futures contracts are settled by delivering warehouse receipts (Mahanta, 2012).

Efficient public warehouse system has the potential to reduce risks and transaction costs in collateralised financing, which may result in broad-based access to such a financing at lower costs.

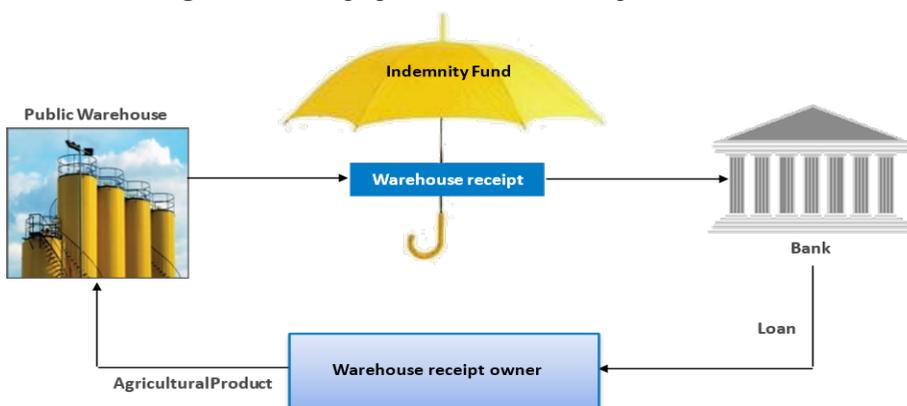
Warehouse receipts can be issued as single or two-part documents. Two-part warehouse receipt at one page contains information on stored commodity, while second part can be detached and serve for data on ownership transfer and pledge. In order to collect commodity owner must present both parts of the warehouse receipt. According to Höllinger and Lamon (2009) single document has an advantage over two-part document because there is possibility of losing detached parts of warehouse receipts triggering unnecessary recovery procedure.

Core elements for successful public warehouse system include:

- Regulatory legal framework is a milestone. Attempts to develop public warehouse without legal framework were proven to be inefficient. Practices in Russia, Turkey and other countries where the banks or commodity exchanges attempted to organise public warehouses based on contractual obligations rather than legal framework were proven to be less efficient;
- Institutions in charge of the licensing and public warehouse supervision;
- Performance guarantees with Indemnity fund in place;
- Introduction of electronic warehouse receipts;
- Farmers, traders, processors, banks familiar with the public warehouse system;
- Public support in the form of the subsidies of loan interest rate against warehouse receipts, storage costs for warehouse receipts owners, favourable decision on loan against warehouse receipts ratings, public warehouse involvement in state grain reserves storage, tax incentives for investors in warehouse receipts, etc.

Figure 1. is presenting lending against warehouse receipts mechanism.

**Figure 1.** Lending against warehouse receipts mechanics



Source: Kovačević & Zakić, 2016.

Another precondition for well-developed public warehouse system, transferring from paper to electronic warehouse receipts, is exceptionally important. Electronic warehouse receipt is secured from forgery. Data on warehouse receipts are available in <http://ea.bg.ac.rs>

the real time preventing frauds and breaking all the geographical barriers as exchange of documents is not needed (which is especially important for commodity exchange trading). Electronic warehouse receipt can be split or enlarged instantly, reducing transaction costs. In electronic warehouse receipts' environment surveillance is improved as inspection service can monitor, in real time, public warehouses activities (Kovačević et al., 2016).

Nowadays blockchain technologies start to be important digital assets for public warehouses. Blockchain based electronic warehouse has various advantages over traditional one according to research results of Yuanjian et al. (2019) and Su and Wang (2020).

Because of importance of public warehouses, especially for agribusiness sector in developing countries, United Nations Commission on International Trade Law (UNCITRAL) is developing universal legal framework for warehouse receipts. It argues that most developing economies have sufficient warehousing infrastructure and secondary markets but lack a modern warehouse receipts law (Dubovec, Elias, 2017)

Serbian public warehouse system is established by the Law on public warehouses for agricultural products enforced in 2009.

Serbia's regulatory framework has been built on best worldwide practice. It includes Ministry of agriculture and water management of the Republic of Serbia (MoA) as a licensing and supervisory institution. In addition, Indemnity fund is established being in charge of guaranteeing delivery of stored commodities. Efficient out-of-court enforcement procedure in the case of public warehouses default is emended.

Warehouse receipts in Serbia are in two-part paper form printed by the National Bank of Serbia (NBS).

Eligible products for public warehouse storages are grain and oilseeds as well as frozen fruits and vegetables.

### **Materials and methods**

To provide objective results, the following methods were used:

- Questionnaire for commercial banks;
- Desktop research;
- Descriptive statistics;
- Comparative analyses.

Main data source was Indemnity fund of the Republic of Serbia.

From the total of 33 licensed banks in Serbia (NBS, 2021), 19 banks responded to the questionnaire. Survey was conducted between January 15<sup>TH</sup> and January 28<sup>TH</sup> 2021.

Questionnaire included 5 statements to be rated as follows:

Please rate importance of public warehouse guarantee performance for financing against warehouse receipts.

- 1) Please rate importance of the supervision of the public warehouses by special inspection service for financing against warehouse receipts.
- 2) Please rate importance of the efficiency of enforcement procedure in the case of the borrower under warehouse receipt for financing against warehouse receipts.
- 3) Please rate importance of the Central bank rating on loans against warehouse receipts for financing against warehouse receipts.
- 4) Please rate importance of the loans against warehouse receipts interest rate subsidies for financing against warehouse receipts.

Respondents could chose the answer from the offered rating scale ranging from 1 – lowest impact, to 5 – highest impact.

The analysis was based on four research hypotheses:

H1: Warehouse receipts represent instrument for overcoming agricultural collateral constrains and enhancing agricultural financing.

H2: Efficient public warehouse system has to be based on established legal framework, rather than contractual obligation among stakeholders.

H3: Efficient public warehouse system has to be based on proven institutional settings: licensing and supervision, guarantee performance and public supports.

H4: Only products that can be stored easily for longer period of time and which quality can be determined at the time of commodity deposition are suitable for public warehouse system – namely grains and oilseeds.

## **Results**

Based on the data from the Indemnity fund of the Republic of Serbia, we analysed the situation in the Public warehouse system in the period 2010-2020. Questionnaire aimed to capture banks attitudes towards the core elements of the warehouse receipt system. The results are presented in the following tables and processed through descriptive statistics.

**Table 1.** Grain and oilseeds public warehouses' licensed capacities in tonnes in period 2015-2020

Year	Month											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2010	0	0	0	0	0	0	6866	6866	6866	6866	6866	6866
2011	6866	6866	14866	14866	14866	14866	19866	24616	29616	29616	29616	22750
2012	32616	32616	32616	38616	38616	42476	61026	63826	83826	80762	80762	73896
2013	76996	76996	76996	76996	62996	62996	77996	71996	107996	110996	110996	120496
2014	117496	117496	117496	117496	117496	117496	121996	120646	120646	84646	77960	77960
2015	68460	68460	68460	68460	68460	59360	48860	34000	34000	34000	14000	14000
2016	14000	14000	14000	14000	14000	14000	14000	11000	11000	11000	11000	11000
2017	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
2018	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
2019	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000
2020	11000	11000	11000	11000	11000	11000	11000	11000	0	0	0	0
<b>Average</b>		<b>34037.33</b>										
<b>St. Dev.</b>		<b>36336.71</b>										

Source: Indemnity Fund of the Republic of Serbia, 2021

Public warehouse cold storage for frozen fruit and vegetables was registered in the period July 2011 to July 2012 in capacity of 900 t (Indemnity Fund of the Republic of Serbia, 2021).

**Table 2.** Number of grain and oilseeds Public warehouses in period 2015-2020

Year	Month											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2010	0	0	0	0	0	0	2	2	2	2	2	2
2011	3	3	4	4	4	4	5	6	7	7	7	5
2012	7	7	7	7	7	7	12	1.3	14	14	14	13
2013	12	12	12	12	12	12	13	12	12	14	15	17
2014	14	14	14	14	14	14	15	14	14	13	11	11
2015	9	9	9	9	9	8	5	3	3	3	2	2
2016	2	2	2	2	2	2	2	1	1	1	1	1
2017	1	1	1	1	1	1	1	1	1	1	1	1
2018	1	1	1	1	1	1	1	1	1	1	1	1
2019	1	1	1	1	1	1	1	1	1	1	1	1
2020	1	1	1	1	1	1	1	1	0	0	0	0
Average	4.79											
St. Dev.	5.04											

Source: Indemnity Fund of the Republic of Serbia, 2021

Only one cold storage public warehouse is licensed in the period July 2011 to July 2012 (Indemnity Fund of the Republic of Serbia, 2021).

**Table 3.** Questionnaire results – banks attitudes regarding the core elements of a public warehouse receipt system

	Guarantee performance	Inspection service	Enforcement procedure	Central bank rating	Interest rate subsidies
Average mark	4.89	4.84	4.84	4.68	4.58
St. Dev.	0.32	0.50	0.37	0.67	0.84

Source: Authors' survey

## Discussions

It can be concluded based on the presented results that public warehouse system in Serbia had two phases. First one was ranging from the beginning to the 2014. In this period number of public warehouses significantly rose. Total value of loans against warehouse receipts was around EUR 50 million, with around 20% lower interest rate compared to similar loans and shorter issuance time (Indemnity fund of the Republic of Serbia, 2021).

Second phase, starting from the end of 2014, when two large scale frauds in two public warehouses occurred, significantly affected local public warehouse system that did not recover until today. From the mid 2020 there are no licensed public warehouses in Serbia.

Based on the worldwide practice and results from this paper the necessary preconditions for successful system of public warehouses are identified including adequate legal settings, business environment and government support.

According to the results of the survey from the point of view of banks, guarantee performance is the most important segment of the public warehouses, followed by the effective enforcement procedure, efficient inspection service, favourable central bank rating for loans against warehouse receipts and government subsidies for financing based on warehouse receipts.

The aim of this paper was to analyse the core elements of a warehouse receipt system in Serbia and to draw conclusion on reasons for failure and future activities for reconciliation of this important system. Total of 8 core elements of a warehouse receipt system was recognised and current state in Serbia is analysed and compared to the worldwide practice.

1. Public warehouse system in Serbia is based on the **legal settings and relevant law**. Government legal settings is the most appropriate one having advantages over private warehouse system based on contractual obligations. According to Höllinger and Rutten (2009) countries with fully established public legal framework such as USA, Bulgaria, Hungary, Slovakia and Lithuania, etc. have more efficient and successful warehouse systems. Countries with a partially developed warehouse receipt system such as Romania, where Indemnity fund is missing, are significantly lagging behind the first group of countries. Finally, countries without government legal framework that are relying on contractual obligations with private stakeholders i.e. Russian Federation, Turkey etc. cannot build sufficient level of trust to land against public warehouses receipts.<sup>4</sup>

**2. Licensing and supervision.** Clear responsibility for licensing and supervision of the public warehouses is exceptionally important (Miranda, et al., 2019). Licensing has the role in building integrity and keeping solvency of public warehouses.

In Serbia is applied the most common practice – Ministry of agriculture is in charge of licensing and supervision of the public warehouses. Licensing requirements include: capital requirements, required business indicators, minimal storage capacity, and technical requirements (warehouse manager must not be criminally convicted, equipment, storage capacities, etc.). All stakeholders having interest in warehouse receipts are granted the access to an third party laboratory for dispute resolution. Supervision of the public warehouses is emended by the Law to the special inspection unit within the MoA. The main reason causing the deterioration of the Serbian public warehouse system is that special inspection unit has never been effectively formed in practice, leaving public warehouses without proper on-site inspection.

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4 The most common organisers of the private warehouse systems are commodity exchanges aiming to secure delivery of goods and banks aiming to use stored goods as collateral.

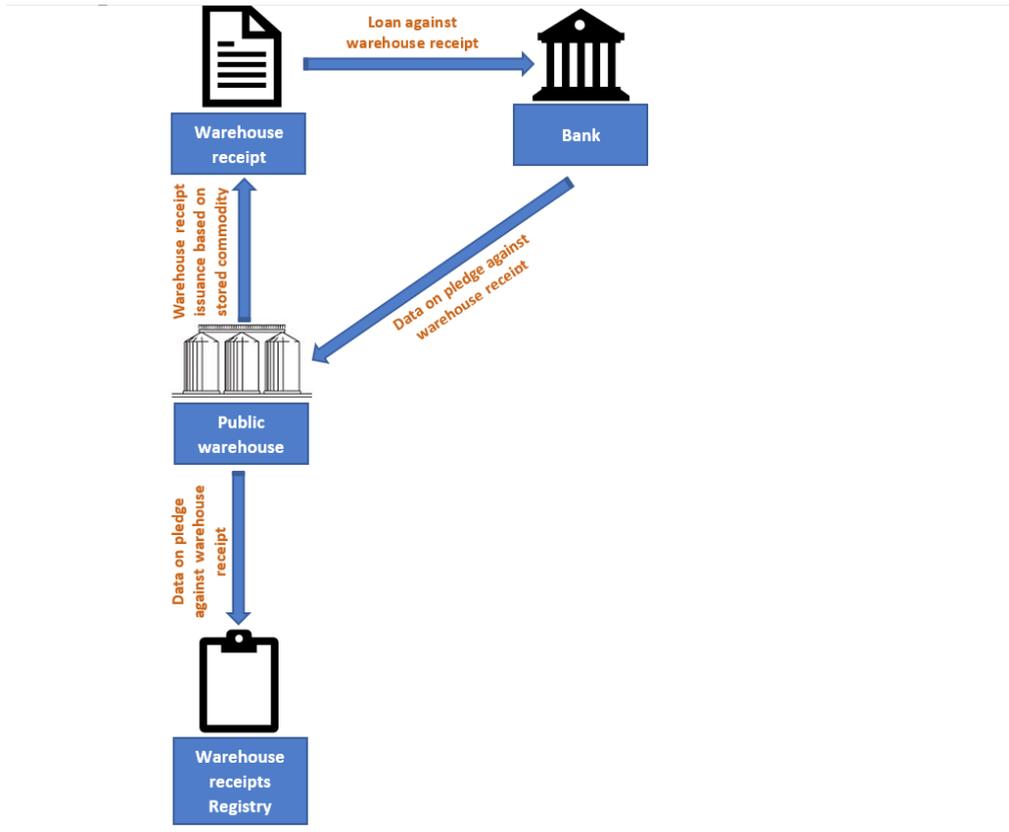
**3. Eligible products** for public warehouses are only suitable products that can be easily stored with minimal quality losses and shrinkage over a longer period and with accurate quality assessment at the time of commodity deposition (Höllinger, Rutten, 2009). Successful public warehouse systems worldwide are the ones with grain and oilseeds. Serbia, besides grain and oilseeds, introduced cooling houses for frozen fruits and vegetables. The main goal was to provide financing for raspberry producers, but theoretical knowledge is proved and these alternative products are abandoned due to the challenges in the quality determination (quality cannot be determined at the time of deposition, needs to be frozen and classified prior to quality determination, etc.). Serbian experience can serve as a valuable lesson learned.

**4. Eligible warehouse receipt owners** in Serbia are all parties including public warehouses that can issue warehouse receipts for their own stored commodity. Serbia has applied the USA liberal system based on negative experience in other countries such as Bulgaria who banned public warehouses to issue warehouse receipts for own commodity (Kovačević et al., 2016). This ban proved to be inefficient in practice, causing fictive third persons to take position in warehouse receipts without real risk reduction effect. Based on conducted analyses, the Serbian system can be recommended.

**5. Warehouse receipt form.** In Serbia, a warehouse receipt is a double-component document in printed form. The NBS is printing warehouse receipts with counterfeiting protection. In order to withdraw commodity from the public warehouse, the owner has to present both parts. Experience like Bulgarian, USA, Canada's etc. where the warehouse receipts are single documents are pointing out that it is a better solution due to potential problems caused with the loss of one part of the document (Höllinger, Rutten, 2009).

After pledge endorsing, the bank is sending data on loan against warehouse receipt and relying on the public warehouse to enter pledge data in the paper register of warehouse receipts that represents significant risk for the bank (Figure 2).

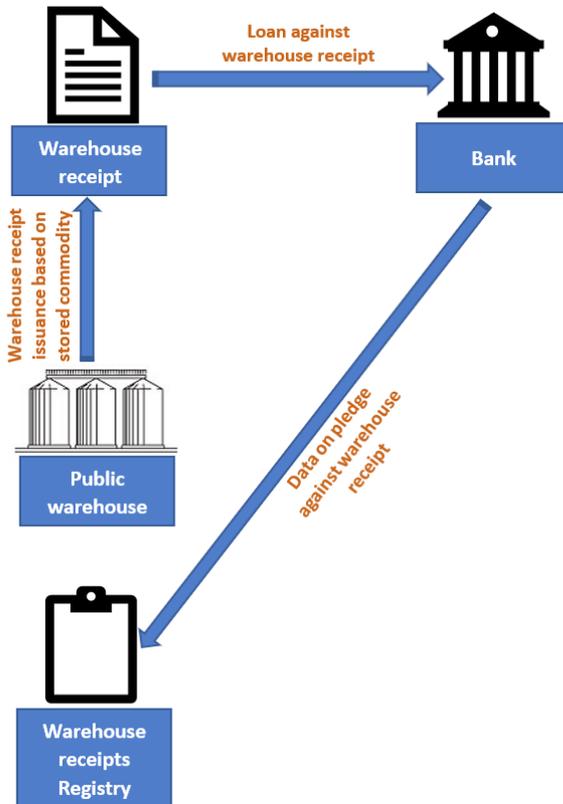
**Figure 2.** Lending against warehouse receipts in paper warehouse receipts Registry environment



Source: Authors

Another important issue is transferring warehouse receipts in electronic form. This is challenging due to the warehouse receipts individual nature. Serbia takes interesting path by developing in 2011 software with FAO supporting electronic Registry of the warehouse receipts (Figure 3).

**Figure 3.** Lending against warehouse receipts in electronic warehouse receipts Registry environment



Source: Authors

This system is semi-electronic warehouse receipt system leaving public warehouse receipts in paper form, while warehouse receipt register is kept in electronic form. This registry could significantly lower the risk of fraud<sup>5</sup> and can be example for countries aiming to establish gradually the public warehouse system. Electronic Registry has never been introduced in the Serbian public warehouse system (Kovačević et al., 2016).

**6. Guarantee performance** in Serbian public warehouse system is in accordance with best practice. Indemnity fund is established in charge of collecting monthly fees from public warehouses with aim to have sufficient capital to indemnify in 5 business days person having legal interest in the warehouse receipt in the case of the public warehouse default to deliver commodity. Additionally, Serbian system embedded mandatory warehouse insurance i.e., for flood, fire, etc. Most of the public warehouses like Bulgarian are insuring on voluntary bases. Based on the conducted analyses it may

<sup>5</sup> Banks and traders can access Registry and check warehouse receipt status, bank are allowed to endorse pledge on the warehouse receipt directly in Registry, etc.

be seen that Serbian system has advantages in standardisation easing pledge and trade. Valuable lesson from Serbia is that Indemnity fund has to have initial government capitalisation in order to be able to perform strong guarantee performance from the system establishment. When two frauds occurred in Serbian warehouses Indemnity fund did not have sufficient funds to indemnify lenders. Bulgaria can serve as a positive example, since at the beginning government provided interest free loan to the Indemnity fund for the period of three years. Debt was repaid on time.

**7. Central bank decision on loan against warehouse receipts rating.** In 2011, NBS set an “Adequate credit rating” for loans against warehouse receipts. This decision achieved a double effect. First, commercial banks, when issuing loans that have a commodity pledge as collateral, are required to deposit only 5% of the loan amount to the NBS, which allows lower interest rates due to reduced commitment of funds. Another effect achieved by the aforementioned decision of the NBS is that a signal is sent to commercial banks that the warehouse receipt is a first-class commodity security (Kovačević, Zakić, 2016).

**8. Subsidies to public warehouses/loans against warehouse receipts.** The European Bank for Reconstruction and Development (EBRD) approved in 2011 EUR50,000,000 through a “risk-sharing system” for three commercial banks, intended for loans issued on the basis of warehouse receipts (Kovačević et al., 2013).

**9. Other supports** important as impulse for public warehouses came from the Commodity reserve directorate decision in 2013 automatically accepting public warehouses as government warehouses, while unlicensed warehouses had to meet the requirements of the Directorate. In 2013 Commodity reserve directorate withdraw this decision leaving public warehouses obliged to go through guaranteeing and licensing procedure twice. Common EU practice is to use public warehouses for intervention and other government reserves.

The research conducted in this paper supports the assertion of the stated four research hypothesis. Warehouse receipts are potential viable instrument for overcoming agricultural collateral constrains and enhancing agricultural financing. Efficient public warehouse system has to be based on established legal framework, rather than contractual obligations among stakeholders but also proven institutional settings: licensing and supervision, guarantee performance and public supports. Finally, only products that can be stored easily for longer period of time and whose quality can be determined at the time of commodity deposition are suitable for public warehouse system.

## Conclusions

Public warehouse receipt system emerged as a proven practice in many countries. Lending against warehouse receipts allows the use of stored commodity as a pledge for short term loans. In this way, one of the most significant limiting factors in the development of the agribusiness sector, the chronic lack of funds, can be successfully overcome. Warehouse receipts also have a positive impact on banks by creating new

asset classes. Of particular importance is the positive impact of warehouse receipts on the improvement of commodity trading, where delivery in stock exchange trading is done exclusively through warehouse receipts. Based on the conducted analyses, it can be concluded that the Serbian public warehouse system is based on a complete and in practice confirmed legal framework. Additionally, the Serbian system benefited from the positive loan against warehouse receipts NBS rating, Commodity reserve directorate decision to recognize public warehouses as a government storages and subsidies for loans against warehouse receipts. All of these activities are reasons for explosive development of the public warehouses till 2014. Lessons learned from Serbia show that proper legal framework needs to be followed with full implementation. Deterioration of the public warehouse system came as a result of not established inspection service, lack of Indemnity fund initial capitalisation and Commodity reserve Directorate revoking of public warehouses recognition as a government warehouses.

Analysis conducted in this paper is the first comprehensive scientific research on Serbian public warehouse system. It is aimed to serve as a roadmap for Serbian warehouse system improvement while in parallel it can be useful for developing and other countries striving to establish efficient public warehouse systems.

### Acknowledgements

Authors acknowledge support from the Ministry of Education, Science and Technological Development of the Republic of Serbia (Decision on financing scientific research work in 2021 No 451-03-9/2021-14).

### Conflict of interests

The authors declare no conflict of interest.

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