



ECONOMIC ANNALS-XXI

ISSN 1728-6239 (Online)
ISSN 1728-6220 (Print)
<https://doi.org/10.21003/ea>
<http://ea21journal.world>

Volume 192 Issue (7-8(2))'2021

Citation information:

Lemishko, O., & Shevchenko, N. (2021). Lending in the agricultural sector of Ukraine: challenges and solutions. *Economic Annals-XXI*, 192(7-8(2)), 74-87. doi: <https://doi.org/10.21003/ea.V192-07>

UDC: 33.336.3



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Lending in the agricultural sector of Ukraine: challenges and solutions

Abstract. The promotion of efficient development of productive resources, specific geographic areas, and branches of the economy is the fundamental reference point of the financial and credit policy of the state. In particular, the agricultural sector has certain features of capital formation within the financial system of the state. This is reflected in the requirements and approaches to the development of financial policy by the state and in the corresponding mechanism for its implementation. Being an important tool within this mechanism, lending is aimed at ensuring the economic growth of the agricultural sector. State support facilitated the system of subsidizing loans by providing funds to reduce the cost of loans for farmers in Ukraine, thus encouraging increased productivity in the agricultural sector at the initial stage. However, gradually, this caused a debt agricultural economy that became dependent on the state and started negatively affecting the elimination of structural, intersectoral, and territorial disparities in the agricultural sector.

Therefore, the article is relevant, with mentioned issues requiring immediate examination of state credit support to the agricultural sector as well as justification of financial and credit policy of the state with the view of mutually beneficial cooperation between banking institutions and Ukraine's agricultural sector for stable and efficient development of the latter.

The article analyzes the market of bank lending to agricultural enterprises. It also reveals the influence of bank lending on the development of the agricultural sector in Ukraine. The study identifies subjective factors considered as biggest challenges for lending to the agricultural sector in Ukraine.

The core problems of lending to the agricultural sector in Ukraine are identified in our study, namely: increasing inflation risks; ineffectiveness of economic promotion programs, tightening of the NBU's monetary policy, underdevelopment of the non-banking financial market, unfavorable conditions in the foreign financial markets.

Measures are suggested to solve the problems of lending to the agricultural sector, the essence of which comes down to the development of partnership mechanisms between the state, agricultural enterprises, and banking institutions. A unified regulatory and methodological framework for lending secured by agricultural land should be established.

The paper covers European land mortgage lending practices. In Ukraine, they might be adopted by directly raising public funds not only through an authorized state credit institution but also through private credit institutions operating in a market environment.

Keywords: Lending; Agricultural Sector; Credit; Public Sector; Market Relations; Agricultural Enterprises; Equity Capital

JEL Classification: H81; Q1; H7; Q13; D24

Acknowledgements and Funding: The authors received no direct funding for this research.

Contribution: The authors contributed equally to this work.

Data Availability Statement: The dataset is publicly available from State Statistics Service of Ukraine and National Bank of Ukraine.

DOI: <https://doi.org/10.21003/ea.V192-07>

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Актуальні проблеми кредитування аграрного сектору України та шляхи їх вирішення

Анотація. Стимулювання ефективного розвитку продуктивних сил, окремих територій і галузей економіки є головним орієнтиром фінансово-кредитної політики держави. Зокрема, аграрний сектор економіки має певні особливості щодо процесу капіталоутворення в фінансовій системі будь-якої держави. Це відображається на вимогах і підходах до розробки фінансової політики з боку держави та на формуванні й застосуванні відповідного механізму її реалізації. Кредитування є важливим інструментом механізму, орієнтованим на забезпечення економічного зростання агросектору. Держпідтримка сприяла системі субсидування кредитів через надання коштів на здешевлення кредитів аграріям в Україні на початковому етапі, спонукавши до збільшення продуктивності аграрного сектору. В свою чергу це поступово сформувало боргову аграрну економіку, яка стала залежати від держави, та негативно впливати на ліквідацію структурних, міжгалузевих і територіальних диспропорцій в аграрному секторі економіки.

З огляду на вищевикладену аргументацію, тема статті вважається актуальною, а зазначені проблеми вимагають негайної діагностики кредитного забезпечення аграрного сектору економіки та обґрунтування напрямів фінансово-кредитної політики держави з точки зору взаємовигідного співробітництва на рівні держави, аграрного сектору та банківських інституцій із метою стабільного та ефективного розвитку агросектору України.

У статті проаналізовано ринок банківського кредитування аграрних підприємств. Виявлено вплив банківського кредиту на розвиток агросектору в Україні. За результатами дослідження встановлено суб'єктивні фактори, що стають основними перепонами щодо кредитування аграрного сектору в Україні.

Визначені основні проблеми, які пов'язані з кредитуванням аграрного сектору в Україні, а саме: нарощення інфляційних ризиків; недовірливість програм стимулювання економіки, посилення жорсткості монетарної політики НБУ, низький рівень розвитку небанківського фінансового ринку, несприятливі умови на зовнішніх фінансових ринках.

Запропоновані заходи для вирішення проблем кредитування аграрного сектору, сутність яких заключається в необхідному відпрацюванні механізмів партнерства держави, аграрних підприємств та банківських інститутів. Необхідним є створення єдиної нормативно-методологічної бази кредитного забезпечення для надання кредиту під заставу землі сільськогосподарського призначення.

У роботі використано досвід європейських країн щодо функціонування системи земельно-іпотечного кредитування, який необхідно врахувати для України, шляхом прямого залучення державних коштів не тільки через уповноважену державну кредитну установу, а й через недержавні кредитні установи, які працюють у ринковому середовищі.

Ключові слова: кредитування; аграрний сектор; державний сектор; ринкові відносини; аграрні підприємства; власний капітал.

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Актуальные проблемы кредитования аграрного сектора Украины и пути их решения

Аннотация. Стимулирование эффективного развития производительных сил, отдельных территорий и отраслей экономики является главным ориентиром финансово-кредитной политики государства. В частности, аграрный сектор имеет определенные особенности в процессе капиталообразования в финансовой системе любого государства. Это отражается на требованиях и подходах к разработке финансовой политики со стороны государства и на формировании и применении соответствующего механизма ее реализации. Кредитование является важным инструментом механизма, ориентированным на обеспечение экономического роста агросектора. Господдержка способствовала системе субсидирования кредитов путем предоставления средств на удешевление кредитов аграриям в Украине на начальном этапе, увеличивая производительность аграрного сектора. В свою очередь это постепенно формировало долговую аграрную экономику, которая стала зависеть от государства, и негативно влиять на ликвидацию структурных, межотраслевых и территориальных диспропорций в аграрном секторе экономики.

В свете вышеизложенного, тема статьи считается актуальной, а указанные проблемы требуют немедленной диагностики кредитного обеспечения аграрного сектора экономики и обоснования направлений финансово-кредитной политики государства с точки зрения взаимовыгодного

сотрудничества на уровне государства, аграрного сектора и банковских институтов в целях стабильного и эффективного развития агросектора Украины.

В статье проанализирован рынок банковского кредитования аграрных предприятий. Выявлено влияние банковского кредита на развитие агросектора в Украине. По результатам исследования установлено субъективные факторы, которые становятся основными преградами по кредитованию аграрного сектора в Украине.

Определены основные проблемы, связанные с кредитованием аграрного сектора в Украине, а именно: наращивание инфляционных рисков; неэффективности программ стимулирования экономики, ужесточения монетарной политики НБУ, низкий уровень развития небанковского финансового рынка, не благоприятны условия на внешних финансовых рынках.

Предложены меры для решения проблем кредитования аграрного сектора, сущность которых заключается в необходимости отработки механизмов партнерства государства, аграрных предприятий и банковских институтов. Необходимо создание единой нормативно-методологической базы кредитного обеспечения для предоставления кредита под залог земли сельскохозяйственного назначения.

В работе использован опыт европейских стран по функционированию системы земельно-ипотечного кредитования, который необходимо учесть для Украины, путем прямого привлечения государственных средств не только через уполномоченное государственную кредитное учреждение, но и через негосударственные кредитные учреждения, которые работают в рыночной среде.

Ключевые слова: кредитование; аграрный сектор; государственный сектор; рыночные отношения; аграрные предприятия; собственный капитал.

1. Introduction

A critical vector of the credit policy is stimulating the efficiency of productive forces, territories and economic sectors. The agricultural sector has specific features of the capital formation in the national financial system. They have implications for organization of financial relations in the business management of financial resources, for requirements and approaches to the elaboration and implementation of the regulatory framework, and for the creation and use of its mechanisms. Lending is an important tool in the financial policy implementation focused on economic growth in the agricultural sector. A lending scheme created in Ukraine involved government subsidies to reduce the cost of agricultural loans, thus stimulating a productivity growth in the agricultural sector at the earlier phase, but gradually creating a debt agricultural economy with heavy reliance on the government support. This inhibited value-added generation and failed to eliminate structural, cross-sectoral and territorial disproportions in the agricultural sector.

The above mentioned raises the importance of diagnostics of the credit security in the agricultural sector, identification of urgent problems and justification of the credit policy directions in a way to set up mutually beneficial cooperation between the government, the agricultural sector and the banking sector, to achieve the stability and effectiveness of the agricultural sector in Ukraine.

Methodological basis of the study. In the course of the study, we used a set of methods, such as generalization, comparison, analysis, systematization, processing, economic and mathematical modeling.

2. Brief Literature Review

The problematics of lending and the essence and features of the lending process and mechanisms have been elaborated in works of domestic and foreign researchers: T. Kosova (2013); O. Nepochatenko, R. Mudrak and P. Bechko (2020); Orzul (2016); F. Roger (2020); K. Nikolopoulos and A. Tsalas (2017); T. Barnhill and L. Schumacher (2014); D. Gray (2012).

Applied aspects dealt with in methodological developments for diagnostics of the financial condition in the agricultural sector and its performance have been explored by the following researchers: P. Kaur and M. Goyal (2018); H. Hansson, G. Manevska-Tasevska and M. Asmild (2018).

The mainstreaming of the financial policy role and its impact on the macroeconomic stability, sustainable development, designing the toolkit for the financial and lending mechanism to support the agricultural sector have been in focus of domestic and foreign researchers, such as: J. Sandberg, D. Rönnegard (2020); S. Bose, G. Dong, A. Simpson (2019); A. Brzozowska, D. Bubel, A. Kalinichenko, L. Nekrasenko (2017); S. Brunnhuber (2017); K. Bäckstrand (2015); M. Jeucken (2001); D. Griggs et al. (2013); O. Horokhova et al. (2020); V. V. Balitska and L. M. Piskun (2020).

The system modelling of effective financial management, econometric studies of the effects of financial support for the agricultural sector have been made in works N. Davydenko, M. Ilchuk and Y. Nehoda (2019); I. Marques-Perez, I. Guaita-Pradas and J. Pérez-Salas (2017); D. Bessler et al. (2010); V. Fenyves, T. Tarnóczy and K. Zsidó (2015); G. Yuandong, W. Tao, Y. Wen and W. Xiaohua (2013).

Commending the significant contribution of researchers in elaborating theoretical and methodological guidelines for bank lending in the agricultural sector, raising lending capital for agricultural businesses, it is important to stress that there has been no comprehensive and systemic study of problems related with stabilization of the lending process in the agricultural sector, e. g. through the cost reduction mechanism.

The article uses the authors' earlier works that focus on modeling endogenous factors influencing the efficiency of total capital in agriculture of Ukraine (Lemishko, 2017), elaboration of tax policy tools, including identification of promotion tools in the agricultural sector; (Lemishko, 2018), research of Ukraine's foreign economic policy related to the EU and taxation of transactions involving agro-industrial complex products (Shevchenko, 2019).

3. Purpose

The purpose of the study is to identify vital problems of lending in the agricultural sector, including ones related with organization of lending with government support, and to justify the solutions of the above mentioned problems.

4. Results and Discussion

Based on the diagnosis was found that the dynamics of sources of economic entities capital formation in agriculture, forestry and fisheries of Ukraine for the period 2001-2020 had a negative trend of structural deformation due to a decrease in the share of own sources of capital formation. During the period 2001-2020, the valuation of equity of economic entities in agriculture, forestry and fisheries of Ukraine increased 13.78 times (from UAH 41.51 billion in 2001 to UAH 572.2 billion in 2020). At the same time, the value of borrowed capital for the same period of time increased 19.06 times (from UAH 21.63 billion in 2001 to UAH 268.93 billion in 2020). Higher growth rates of borrowed capital compared to own one led to an increase in the debt ratio from 0.34 to 0.47 (Figure 1).

Therefore, the cost estimate of the own capital related to the borrowed capital decreased (the rate of decrease being 1.38). Given the derived negative tendencies in the capital formation, it can be concluded that the real capitalization level in the agricultural sector of the Ukrainian economy considerably reduced in the studied period. This adversity is a catalyst of excessive lending in the agricultural business, resulting in a major part of the sectoral output and turnover being spent as debt service, thus creating a strong impediment for the extensive capital reproduction process.

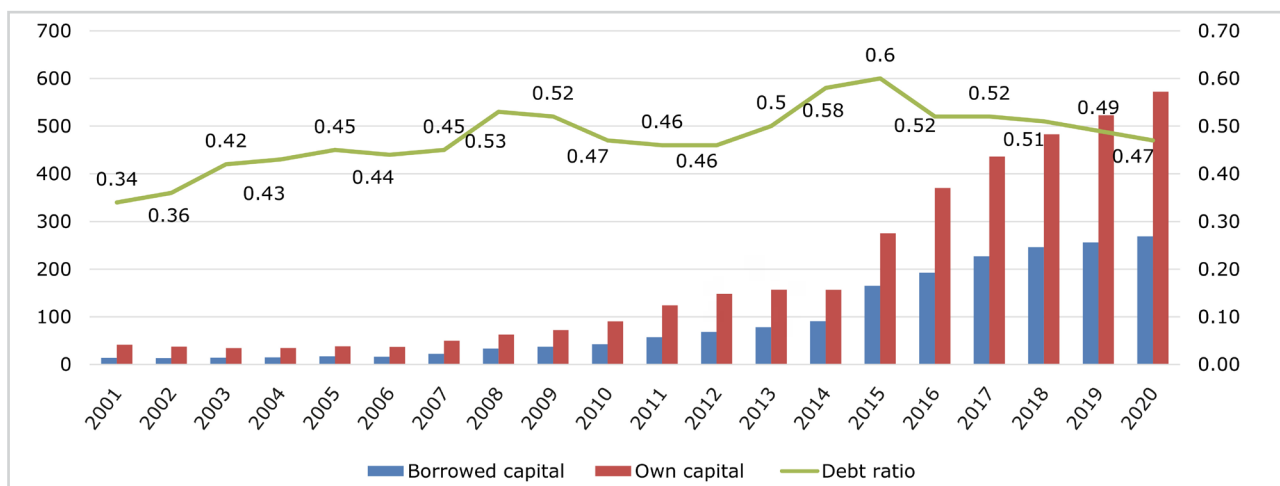


Figure 1:
Trends in the debt ratio of economic entities in agriculture, forestry, and fisheries of Ukraine, 2001-2020

Source: Compiled by the authors using data of State Statistics Service of Ukraine (2021)

In absolute terms, the volume of loans to the agricultural sector during 2000-2018 increased from 0.7 billion UAH to 67.7 billion UAH and had a relatively stable growth trend, in 2019 their volume decreased to 63.5 billion UAH (Figure 2). In 2020, the situation changed for the better and amounted to UAH 65.1 billion UAH.

The share of loans in gross output during 2001-2006 increased from 2.5% to 25.0% and after relative stabilization in 2007 increased sharply to 43.8% in 2008. This is explained both by the increase in the value of loans in foreign currency equivalent in hryvnias in the conditions of depreciation of the national currency, and by the slowdown in the growth rate of agricultural output.

After a decrease to 30.9% in 2011, there was an increase to 35.4% in 2014 (similar reasons to 2008). After a sharp drop to 20.8% in 2015, the share of loans in gross output continued to decline slowly to 19.5% in 2019, which corresponds to the level of early 2016. The share of loans of economic entities in the agro-sector in their total capital during 2001-2007 increased from 2.7% to 18.3%, by it decreased to 11.9%, after growing to 13.8% in 2013 there was a steady trend to reduce the share to 6.2% in 2019 (mid-2003 level) in 2014. In 2020, it amounted to 6.3%. However, this did not affect the overall picture.

Thus, credit support to the agricultural sector lags behind the growth rate of production and total financial resources at its disposal. The current financial policy for the agricultural sector does not create a real economic basis for the effective use of loans for production needs of enterprises. This is supported by O. Lupenko, who also identifies the problems of insufficient financial resources for the development of agro-industrial enterprises (Lupenko, 2019). This confirms the relevance of the research topic today.

The effectiveness of agricultural production is subordinated to the strategic focus on long-term lending of agricultural producers, with loans used as capital investments in technological renovation and business expansion. This opinion is substantiated by V. Todosiichuk, who has studied the trends in lending to the agricultural sector in 2000-2017 (Todosiichuk, 2018). It's worth noting that the situation has not changed much in recent years. Analysis of the dynamics and structure of lending to economic entities of Ukraine showed that during 2001-2020 the volume of

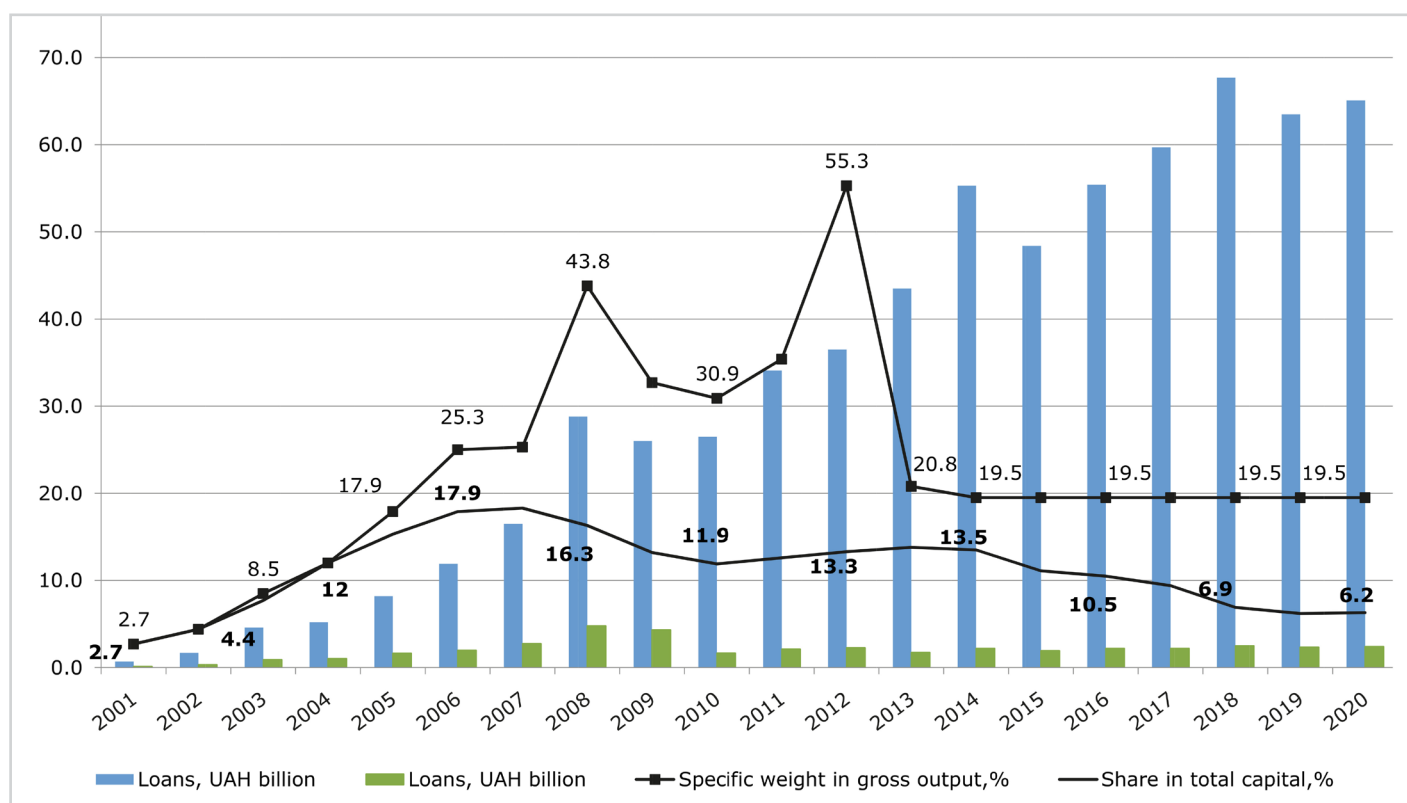


Figure 2:
**The share of agriculture, forestry, fisheries in lending
(in the loan portfolio of Ukraine's banking system)
and the output of products (goods, services) of the national economy (reference year)**
Source: Compiled by the authors using data of the Bulletin of the National Bank of Ukraine (2021)

credit investments in the real sector of the Ukrainian economy grew steadily (Bulletin of the National Bank of Ukraine, 2020): lending to economic entities in absolute terms increased from UAH 26.403 billion in 2001 to UAH 781.88 billion in 2019 (an increase of 29.61 times, including short-term - 18.73 times, long-term - 71.23 times).

In spite of a significant contribution of the agricultural sector in the domestic economy as a whole and in addressing economic and social issues in particular, the share of loans provided to agricultural enterprises in the total lending of the Ukrainian business sector still remains too low. A comparative assessment of the credit portfolio structure in the domestic economy and in the agricultural sector enables for the following conclusions by the results of graphic visualization (Figure 3).

The share of loans in the national currency by agricultural sector (72.1%) is 1.28 times greater than by the national economy (56.5), the most significant is this gap in medium-term loans - 80.6% vs. 44.8% (difference of 1.8 times), as well as long-term loans - 64.9% against 39.3% (difference of 1.65 times). The lack of sources for long-term lending and the high share of short-term debt have provoked deformities in the capital structure of agricultural enterprises. O. Chyhryn is of a similar view: analyzing the trends in lending to the agricultural sector, she indicated that short-term loans predominate among the granted bank agricultural loans (Chyhryn, 2020).

It is necessary to dwell on the quality of the loan portfolio of borrowers in the agricultural sector in accordance with Resolution No. 351 (Resolution of the National Bank, 2016).

As of 01.01.2020, the share of agricultural, forestry and fisheries enterprises in the portfolio of problem loans is 15.07%, including in the national currency - 16.11%, in foreign currency - 13.96%. The share of non-performing loans in the agricultural sector as a whole (42.19%) and in the national currency (27.37%) is lower than in the national economy as a whole - the corresponding figures are 54.42% and 52.61%. The foreign currency loan portfolio is higher: 60.43% against 56.35%. The excessive demand for loans in the agricultural sector (compared with other economic sectors), objectively existing in Ukraine, failed to be fully met due to underdeveloped lending schemes and a high cost of lending resources; the search for cost reduction ways resulted in a partial reimbursement of interest rates from budgetary funds being considered a main effective tool of the credit mechanism designed to support the agricultural

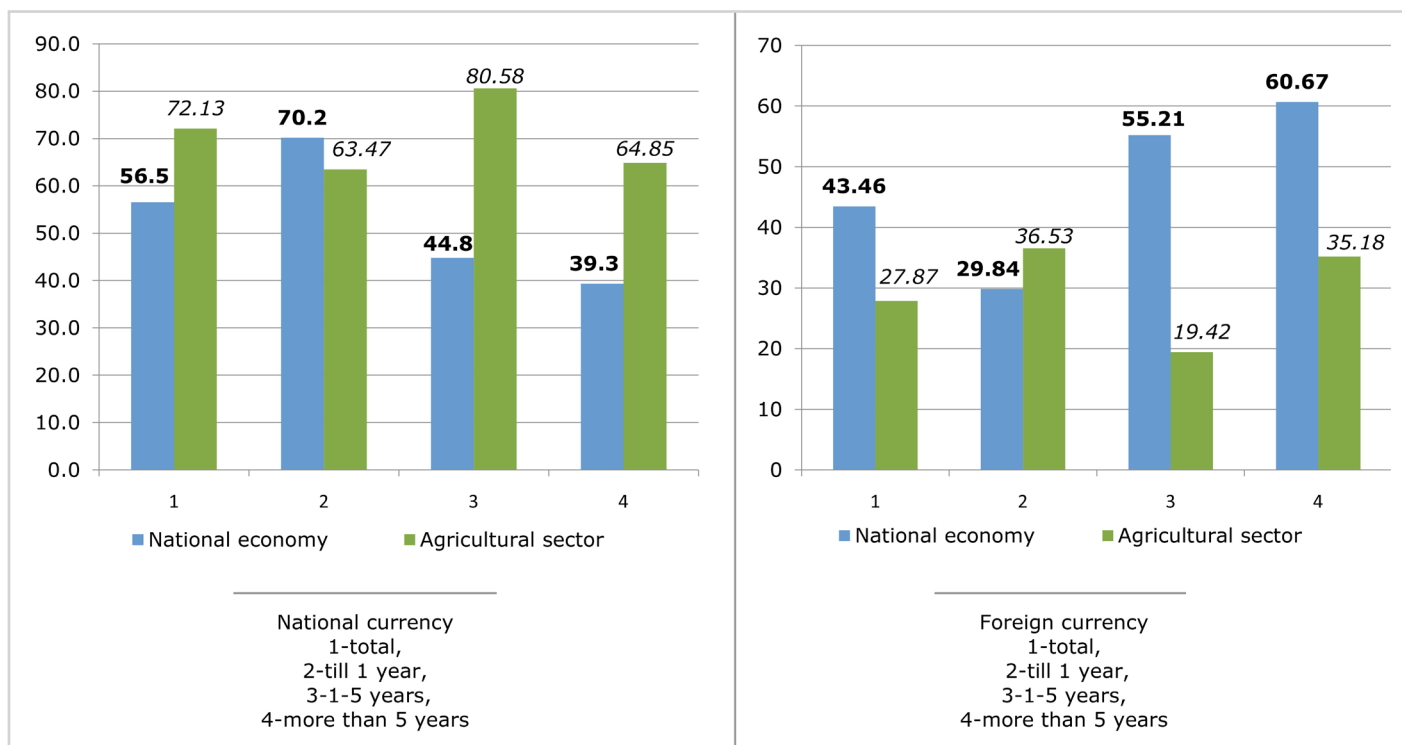


Figure 3:

Loan portfolio vertical distribution by terms as of 01.01.2020

Source: Compiled by the authors using data of State Statistics Service of Ukraine, Bulletin of the National Bank of Ukraine (2021)

sector in Ukraine. In her works, N. Trusova also highlights the flaws in the mechanism of the agricultural sector financing by banks (Trusova, 2021). That is what defines the special attention we pay to this aspect considering previous suggestions to increase financial support for agricultural enterprises.

The mechanism for partial reimbursement of interest rates on short-term, medium-term and long-term loans taken by agricultural enterprises in banks and short-term loans taken in credit unions was launched in Ukraine in 2000. Further, the reimbursement was eligible for the loans taken either in the national currency or in a foreign currency when a lender had a foreign economic contract for purchase of devices and equipment manufactured abroad (Resolution of the Cabinet of Ministers of Ukraine, 2007).

During 2001-2008, the volume of soft loans provided by banking institutions to agricultural producers increased from UAH 2.8 to 15.1 billion, or 5.4 times. The number of recipients of soft loans in this period ranged from 5 to 9 thousand businesses in the agricultural sector. Starting in 2009, the number of beneficiaries decreased significantly from 2,231 to 795 in 2016 and subsequently resumed the upward trend to 1,409 in 2019. In 2015, allocations from the State Budget of Ukraine to support preferential lending to farmers increased, which led to an increase in loans from 1.4 million UAH to 5.9 million UAH, or 4.2 times. During 2016-2018, the volume of loans issued under support programs exceeded UAH 6 billion, and in 2019 it amounted to UAH 11.3 billion. In 2020, this figure amounted to UAH 13 billion. At the same time, Ukraine remained in last place among European countries in terms of total support for the agricultural sector: this figure in the European Union, on average, is almost 120 billion euros per year, i.e. 11000 euros / ha, while in Ukraine this figure balances in the range of 1000-2000 euros / ha (Polishchuk, 2017).

We can assume that mortgage lending in the EU is developing by mortgage banks towards a one-tier lending model. The purpose of such an approach is to form a closed system of credit resources. These features of mortgage lending are inherent in the financial structures of Germany, Austria, Britain, France, Spain, etc. For instance, in France and Spain, the above mechanism is implemented through monopoly public mortgage lending institutions (Polishchuk, 2017).

In Poland, several banks specialize in agricultural lending, including BGZ. The state can compensate half the interest rate on long-term loans (up to 10 years). In Poland, preferential lending to the agricultural sector is also common: only 3% of the interest rate amount is paid by the entrepreneur while the rest is paid by the state (Global models of agricultural support, 2021).

Mortgage lending in Germany is provided by a specialized credit institution - the Agricultural Rent Bank (Landwirtschaftliche Rentenbank), which provides, inter alia, long-term loans.

Accordingly, international experience proves that lending to the agricultural sector does not follow the typical pattern of lending to producers in other sectors of the economy. In many cases, the special status of agriculture is pursued by the creation of specialized credit institutions. In general, two main options could be distinguished: raising public funds directly through an authorized state credit institution or non-state credit institutions operating in a market environment but providing some form of capital participation and management for agricultural producers. In particular, it refers to the establishment of credit unions, mutual funds, specialized banks, etc. by agricultural producers (Mortgage lending to the agricultural sector is the experience of Germany, 2021).

Generally, the experience of EU member states could be extremely relevant and of great use for Ukraine. In the 1990s, in conditions similar to the Ukrainian ones, they chose a faster and more radical method of developing the agricultural land market, which led to the dramatic difference between the current socio-economic development of Ukraine and EU member states. It should be noted that the speed of reform and liberalization of the agricultural land market is directly proportional to economic growth and welfare of the population in the new EU member states (Land reform of the new EU member states is the experience of Poland (Land reform of the new EU member states is the experience of Poland, 2020).

Figure 4 provides a comparative analysis of prices per 1 ha of land in Ukraine and European Union member states. As we can see, Ukraine's position remains on a par with such countries as Moldova, Russia, and Latvia. This indicates underdevelopment of the land market in Ukraine, which will irrevocably affect mortgage lending.

Our conclusions are supported by analytical data from economic sources, as well as research by experts in lending, inter alia, research that S. Kushnir conducted within the state program «Affordable loans 5-7-9%» (Kushnir, 2021).

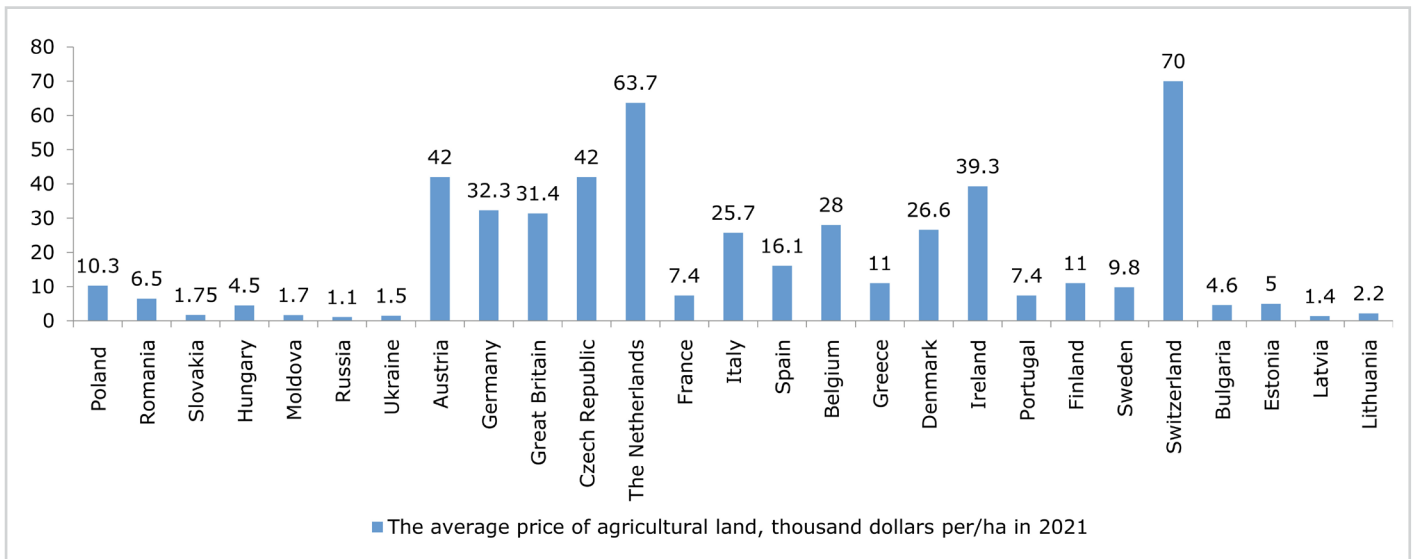


Figure 4:

Comparative analysis of the average price of agricultural land, thousand dollars per ha as of 01.01.2021

Source: Compiled by the authors using data summarized by E. Redih (2018)

The average interest rate on bank loans received by agricultural enterprises in the European Union countries is 3-4%. Interest rates in Ukraine are much higher, which is primarily due to the unbalanced policy measures in the country.

During 2001 - 2019, the amount of interest rates on bank loans received by agricultural producers with state support, fluctuated: during 2001-2004 there was a reduction from 35.0% to 17.0%, after fluctuations at the level of 18.0% -20.0% during 2005-2007 in 2008-2009 their growth continued to 27.0 (Figure 5).

During 2010-2013, interest rates fluctuated at a very high level of 26.0-27.0%, by the end of 2019 they decreased to 14.8% and in 2020 to 15%. The share of interest rate that was subject to compensation by the state ranged from 21% in 2002 to 4.8% in 2018-2019, in 2020 - 5%. The largest increases in its volume took place in 2006 (11.5%), 2009 (9.0%), 2015 (7.8%), and 2017 (6.9%).

The share of compensation had a general tendency to decrease. It was the highest in 2002 (78%), by 2007 it fluctuated at 39-58%, in 2008 it dropped sharply to 29% and over the next eight years it fluctuated at 30%. After growing to 40% in 2017, it returned to the previous level.

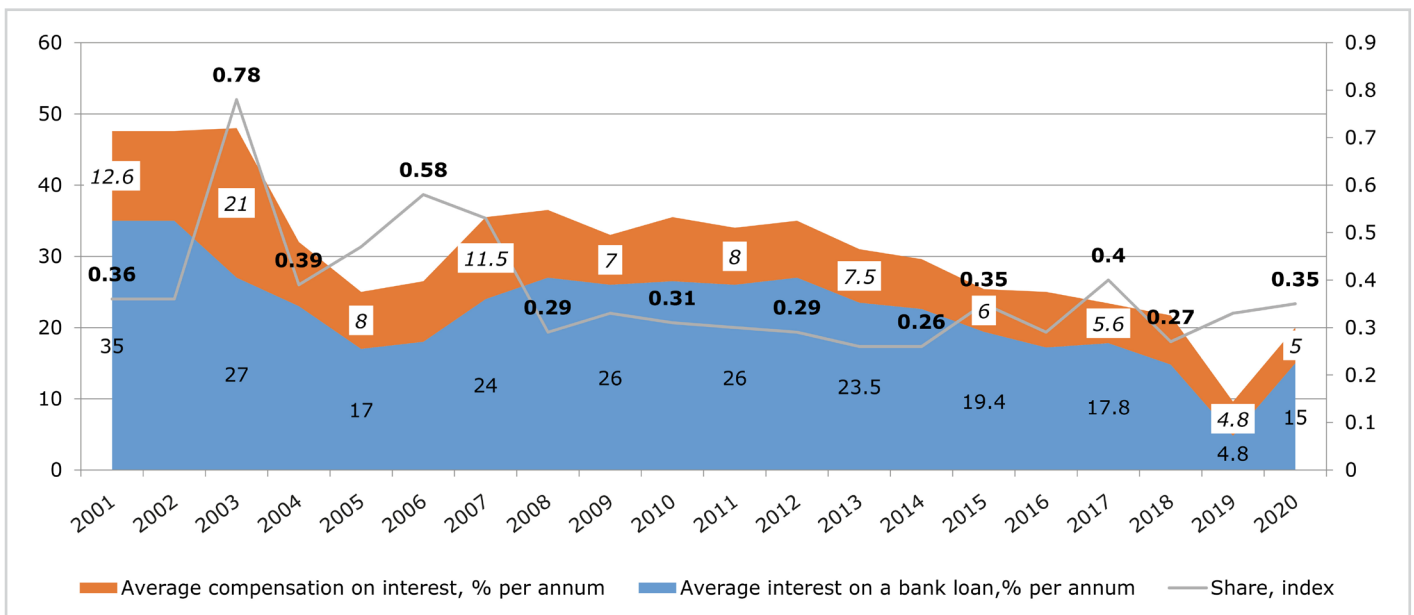


Figure 5:

Relative indicators of the situation with the lending to agricultural enterprises in Ukraine, 2001-2020

Source: Compiled by the authors using data of State Statistics Service of Ukraine, Bulletin of the National Bank of Ukraine (2021)

The effectiveness of lending is conditional on the soundness of lending policy, the efficiency of levers of the lending mechanism, and the macro-financial stability in the country. (Figure 6) illustrates that the demand of agricultural enterprises for bank loans is determined by the net profit as a source of self-financing and the government support, with the reverse correlation between the two factors, as demonstrated by the mirroring of graphs.

Until 2008, there was a steady increase in specific bank loans by UAH 1 of net profit to the maximum level of 5.0, and the share of soft loans decreased to 10.0% in 2009. During 2010-2014 there was a reduction in the share of soft loans to 2.5% regardless of the growth of specific bank loans in 2013-2014 to 2.6-2.9, compared to 1.3-1.5 in 2010-2012. During 2015-2019, specific bank loans stabilized at a low level (0.5-0.9), and the share of soft loans - 12.0-15.0%, in 2020 - 17.1%.

The effectiveness of the government lending policy in the agricultural sector was, therefore, low in the latest five years, as there was no increase in the bank loans per 1 UAH of the net profit.

The concessional lending scheme in the agricultural sector proved to be ineffective due to the following reasons: (i) no government guarantee that the agricultural policy would be stable, which led to unreasonable amendments in the levers and tools of concessional lending, made virtually each year; (ii) cases of corruption in using administrative levers for distribution of budget funds, bringing to naught the effectiveness of the support scheme in the agricultural sector (Lemishko, 2018; Zinchenko, 2012; Hudz, 2009).

Because reimbursements were paid with delays, the loan concession was devaluated due to inflation processes; heavy amounts of commercial capital could be offered as a mortgage only by agricultural holdings, and strict requirements of banks to the mortgage (and its valuation) made loans inaccessible for other borrows from the agricultural sector; a factor limiting expansion of lending by concessional scheme was ineffective sources for reimbursement schemes, as such sources tended to be found in the operational environment given the deficit of the main financial resource for the reimbursement (Hudz, 2009).

The abovementioned factors considerably reduced the effectiveness of budget financing; the scheme for providing a loan subsidy was revised in 2007, which, in the final end, complicated the lending procedure; this situation had adverse effects for the financial condition of agricultural enterprises, whereas the funds allocated from the central budget for their support were streamlined to banks and increased their incomes.

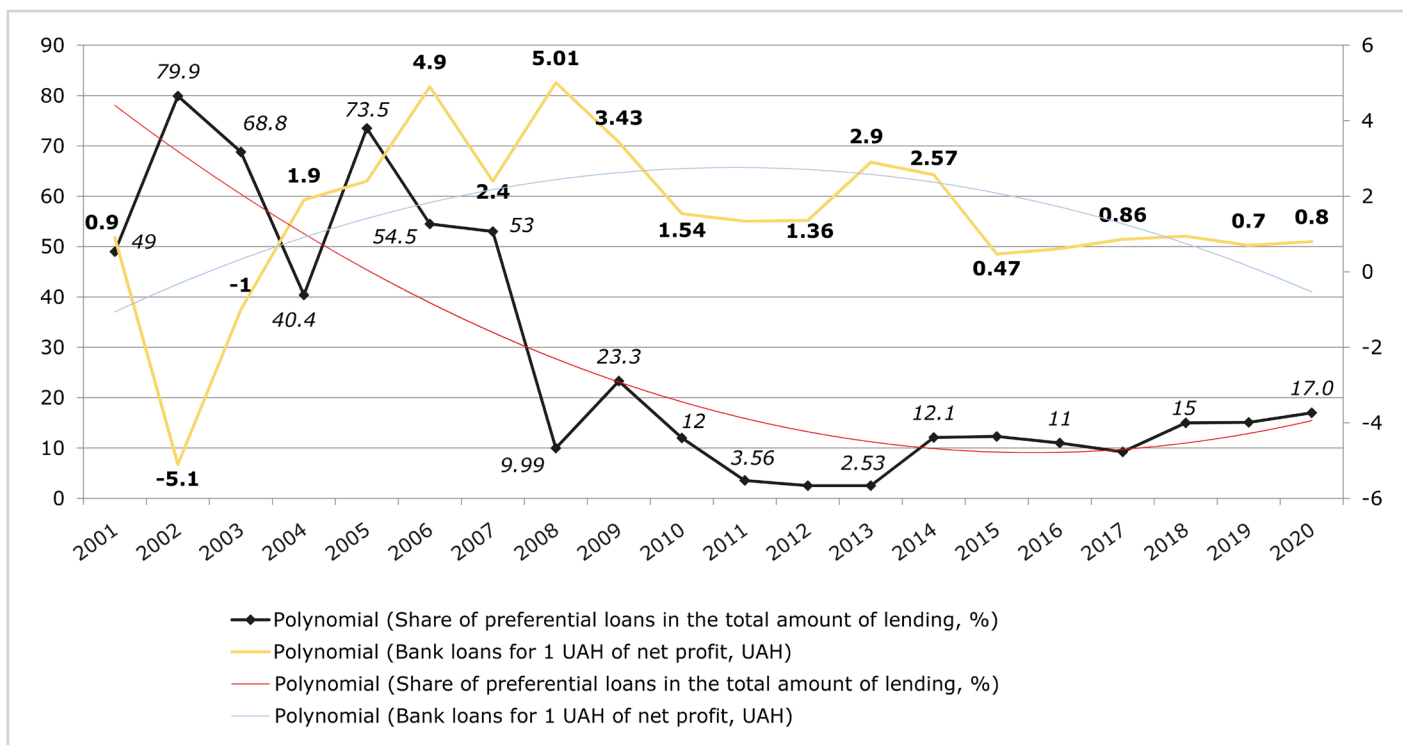


Figure 6:
Trends in bank loans and preferential loans to agricultural economic entities (reference year)
Source: Compiled by the authors using data of State Statistics Service of Ukraine, Bulletin of the National Bank of Ukraine (2021)

The real demand of agricultural enterprises for bank loan is expected to grow along with the increasing production output. This being born in mind, and considering that the agricultural sector in Ukraine is a significant source of currency earnings in the central budget, elaborating of the procedure regulating returns of currency earnings to agricultural producers is becoming an issue of vital importance. We believe that there is a need in legal amendments in the calculations on export-import transactions (About currency and currency transactions, 2018), the deadline of the calculations on export-import contracts has to be prolonged from 180 to 365 days; the currency control over export-import transactions amounting to less than 150,000 UAH has to be abrogated; and e-limits (not more than 2,000,000 euro throughout a calendar year for business operation of a legal entity) have to be introduced. These tools of currency liberalization are expected to improve the macroeconomic conditions in Ukraine, increase the capitalization of the domestic economy and reduce the risks of capital outflow from the country.

To determine the lending potential of the agricultural sector, we will conduct econometric modeling of financial performance of economic entities depending on the indicators of financial and credit policy (volume of loans, including soft loans, interest rates, etc.). Gross agricultural output of Ukraine (Var1) was chosen as an effective indicator. Its volatility is due to the simultaneous action of factors of financial and economic nature, which are diverse in origin. It was found that the average interest rates of banks on loans (Var9) and the multiplication factor (Var13) have no significant correlations. Received loans for 1 UAH net profit (loss) (Var6) have a significant relationship ($r = 0.73$) only with the factor (Var10) - the share of credit resources in the total capital of agricultural enterprises. This indicates the inconsistency of lending conditions in terms of the level of payment to the conditions of economic activity of agricultural enterprises: return on total capital; the amount of financial resources generated by borrowings, etc.

Gross output of agricultural enterprises (Var1) is closely correlated with total capital (Var3), equity (Var4), loans obtained (Var5), including short-term (Var7) and long-term (Var8), the share of preferential loans in the total amount of lending (Var11). All factors except Var11 are closely related, and the correlation coefficient is greater than 0.9. The feedback and the value of the correlation coefficient ($r = -0.625$) can be explained by the reduction of the share of soft loans as the volume of the loan portfolio and gross output of the agricultural sector.

Also statistically significant (-0.670) is the correlation-regression relationship between lending (Var12) and the share of credit resources in the total capital of agricultural enterprises (Var10). The share of soft loans in total lending (Var11) has a close inverse correlation with the return on total capital (Var2) and loans received (Var5). The constructed correlation-regression models have the form shown in (Table 1).

The obtained models (1-6) show that 1 UAH of total and equity of agricultural enterprises generates respectively 0.2328 UAH and 0.6521 UAH gross output. Despite the positive value of the correlation coefficient between the factors Var1 and Var5, the coefficient in equation (3) is negative and means that for the growth of loans by 1 UAH of gross output is reduced by UAH 4.45 due to the need to incur financial costs. There is a feedback between the share of soft loans in the total amount of lending, on the one hand, and the gross output of agriculture, the return on total capital and the received agricultural loans. In models (5) and (6), the share of soft loans is the resulting indicator. According to the results of the analysis, it is revealed that with an increase in the loan portfolio by UAH 1 billion, the share of soft loans decreases by 0.954%, and with an increase in the return on total capital by 1% - decreases by 4.328%.

We interpret the situation as follows: an increase in the return on total capital and the volume of loans issued by banking institutions leads to a decrease in the need for state support for borrowing by agricultural enterprises and, accordingly, has a positive effect on the growth of gross agricultural output (correlation coefficient between factors Var1 and Var5 is $r = 0.917$). We believe that the main problem is the violation of the stability of the state regulatory policy of farmers, as well as the lack of state coordination of the market mechanism in the agricultural sector.

Taking into account model (4), it can be concluded that with an increase in the share of credit resources by 1%, credit efficiency decreases by UAH 1,354, as retrospective analysis shows that in Ukrainian conditions the increase in the share of loans is accompanied by an increase in their absolute size. Since the size of loans is a denominator of the rate of return, the data obtained show that the growth rate of gross output lags behind the rate of increase in

Table 1:
Correlation-regression models for examining the impact of financial and credit policy on the efficiency of agricultural enterprises

Model equation	$\text{Var1} = 0.2328 * \text{Var3} + 39.788$ (1)	$\text{Var1} = 0.6521 * \text{Var4} + 19.91$ (2)																				
R^2	0.8477	0.9716																				
Regression statistics	<table border="1"> <tbody> <tr><td>0.232875</td><td>39.78841</td></tr> <tr><td>0.023935</td><td>13.63034</td></tr> <tr><td>0.847751</td><td>44.04712</td></tr> <tr><td>94.65923</td><td>17</td></tr> <tr><td>183653</td><td>32982.53</td></tr> </tbody> </table>	0.232875	39.78841	0.023935	13.63034	0.847751	44.04712	94.65923	17	183653	32982.53	<table border="1"> <tbody> <tr><td>0.652117</td><td>19.91979</td></tr> <tr><td>0.027037</td><td>6.278142</td></tr> <tr><td>0.971608</td><td>19.02133</td></tr> <tr><td>581.7531</td><td>17</td></tr> <tr><td>210484.7</td><td>6150.789</td></tr> </tbody> </table>	0.652117	19.91979	0.027037	6.278142	0.971608	19.02133	581.7531	17	210484.7	6150.789
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210484.7	6150.789																					
Model equation	$\text{Var1} = -4.448 * \text{Var5} - 10.376$ (3)	$\text{Var12} = -1.354 * \text{Var10} + 21.778$ (4)																				
R^2	0.8402	0.4488																				
Regression statistics	<table border="1"> <tbody> <tr><td>4.448448</td><td>-10.3755</td></tr> <tr><td>0.470574</td><td>17.99732</td></tr> <tr><td>0.840171</td><td>45.13027</td></tr> <tr><td>89.36377</td><td>17</td></tr> <tr><td>182010.9</td><td>34624.61</td></tr> </tbody> </table>	4.448448	-10.3755	0.470574	17.99732	0.840171	45.13027	89.36377	17	182010.9	34624.61	<table border="1"> <tbody> <tr><td>-1.3547</td><td>21.77781</td></tr> <tr><td>0.364113</td><td>4.300223</td></tr> <tr><td>0.448811</td><td>6.616034</td></tr> <tr><td>13.8424</td><td>17</td></tr> <tr><td>605.9082</td><td>744.1225</td></tr> </tbody> </table>	-1.3547	21.77781	0.364113	4.300223	0.448811	6.616034	13.8424	17	605.9082	744.1225
4.448448	-10.3755																					
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605.9082	744.1225																					
Model equation	$\text{Var11} = -0.954 * \text{Var5} + 60.633$ (5)	$\text{Var11} = -4.328 * \text{Var2} + 58.809$ (6)																				
R^2	0.6651	0.4435																				
Regression statistics	<table border="1"> <tbody> <tr><td>-0.954</td><td>60.63292</td></tr> <tr><td>0.164204</td><td>6.280042</td></tr> <tr><td>0.665125</td><td>15.7479</td></tr> <tr><td>33.76521</td><td>17</td></tr> <tr><td>8373.649</td><td>4215.937</td></tr> </tbody> </table>	-0.954	60.63292	0.164204	6.280042	0.665125	15.7479	33.76521	17	8373.649	4215.937	<table border="1"> <tbody> <tr><td>-4.328</td><td>58.80889</td></tr> <tr><td>1.175872</td><td>8.924944</td></tr> <tr><td>0.443523</td><td>20.30042</td></tr> <tr><td>13.54931</td><td>17</td></tr> <tr><td>5583.766</td><td>7005.821</td></tr> </tbody> </table>	-4.328	58.80889	1.175872	8.924944	0.443523	20.30042	13.54931	17	5583.766	7005.821
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Source: Compiled by the authors

loans. During 2001-2009, the value of the credit rate decreased from UAH 39.61 to UAH 1.13 (minimum value) (Figure 7). In the following years, the reverse dynamics began and by the end of 2019 the analyzed indicator increased to UAH 5.1.

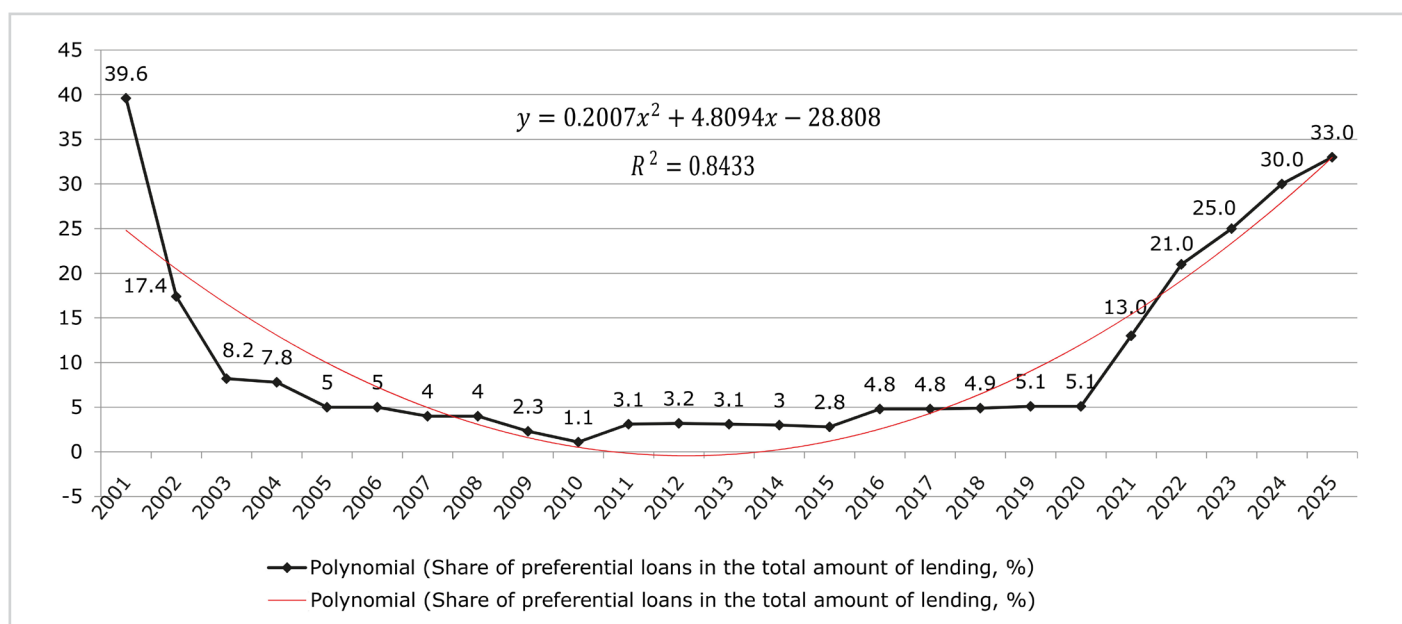


Figure 7:

Trends in the debt equity ratio in the agricultural sector, 2001-2020, and its projection for 2021-2025, UAH

Source: Compiled by the authors using data of State Statistics Service of Ukraine, Bulletin of the National Bank of Ukraine (2021)

In 2020, it reached the mark of UAH 6.1. The dynamics of the rate of credit in the agricultural sector according to 2001-2020 is described by a polynomial trend. Its extrapolation for 2021-2025 makes it possible to expect an increase in credit returns from UAH 13 to UAH 33.0. To determine the coordinate X , in which the polynomial has a minimum value, we find the derivative of the function. Equating it to zero and rounding the value to an integer, we find that $x = 12$ (this corresponds to 2012). The actual minimum value of the function was observed in 2009, i.e. the lag is three years. Positive changes in the change in lending took place in 2015, when it increased from UAH 2.8 to UAH 4.8. That is, it is logical to expect its level to continue to grow, starting in 2018. Hence, the amount of lending resources had direct impact on the agricultural performance. It needs to be emphasized that regulatory mechanisms of the agricultural policy, designed to foster an agricultural business enterprise that would be self-sufficient in the resource capacity building, creditworthy, profit-making, financially sustainable, are important for eliminating adverse tendencies and creating conditions for positive dynamics of growth in the agricultural output (Lemishko, 2018).

5. Conclusions

In our view, the solution to the problems that lending to the agricultural sector currently faces lies in ensuring and implementing effective public financial and credit policy associated with the coherence of interests of all stakeholders, as follows: sustainable economic development of the agricultural sector based on macroeconomic stability, a gradual increase of profitability and financial stability, and increased level of capitalization and the formation of a sufficient liquidity cushion - for the state, farmers, and banks respectively.

It is established that the problems of lending to the agricultural sector in Ukraine arise from the objective basis, namely:

- increasing inflation risks;
- inadequate economic promotion programs, including those aimed at the agricultural sector;
- tightening of the NBU's monetary policy, which increases the cost of bank lending and, consequently, reduces the farmers' demand for credit products;
- underdevelopment of the non-banking financial market, which encourages the banking-centric nature of the financial sector in Ukraine;
- accumulation of risks, lack of the banking sector transparency;
- unfavorable conditions in the foreign financial markets.

The subjective factors considered as biggest challenges for lending to the agricultural sector in Ukraine were identified:

- conflicting lines of the credit mechanism in the implementation of the financial policy of banks and the agricultural sector of the economy;
- a high share of all provided bank loans is allocated to large agricultural companies, agricultural holdings, and agricultural enterprises that export their products;
- low reliance on long-term credit, unreasonable requirements for farmers' mortgage, high cost of notarization of lending;
- slow decision-making by banking institutions in granting loans to agricultural enterprises.

It was suggested to create a unified regulatory and methodological framework for lending secured by agricultural land, which will provide an economic and legal basis for expanding lending to small and medium-sized agribusinesses, as well as available long-term loans for farmers, including those on preferential terms.

A comparative analysis of the experience of EU member states and Ukraine in the land market development was presented. The difference between current indicators of socio-economic development of Ukraine and EU member states was characterized. The positive results of the land mortgage lending system functioning in the European states must be taken into account for Ukraine primarily by improving lending conditions by directly raising public funds not only through authorized state credit institutions but also through private credit institutions operating in a market environment, as well as by interest rate reduction of bank loans.

The mechanism was suggested to address the problems of lending to the agricultural sector, which lies in the balanced partnership between the state, agricultural enterprises, and banking institutes. This mechanism envisages that banks should become a collaborative tool for the teamwork of these entities. Target areas of state support also need to change. State support programs aimed at modernization and technical re-equipment of the production process

in the agricultural sector should be supplemented by partnership (state, banks, agribusiness) lending programs for innovative projects. In our opinion, such projects should first and foremost include initiatives promoting further integration of the agricultural sector of Ukraine into the world agri-food system (for example, the production of agricultural products that meet EU environmental standards). Bank lending (under government support programs, in particular) must be also provided to the innovative projects to restore soil fertility and to implement the latest energy-saving technologies (for the production of agricultural products). According to the given economic forecasts, the volume of capital investments in the agricultural sector from bank loans will be increased.

Prospects for further research are related to several legal and organizational problems that prevent the development of the land market in Ukraine. In our view, addressing these challenges is the subject of future research.

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Received 16.07.2021

Received in revised form 19.08.2021

Accepted 22.08.2021

Available online 21.09.2021