

“Managing the capital force impulse of the agrarian enterprise: transfer approach”

AUTHORS

Olena Fomina  <http://orcid.org/0000-0002-4962-3298>  
 <http://www.researcherid.com/rid/B-2486-2019>  
Olena Moshkovska  <http://orcid.org/0000-0002-1176-9478>  
 <http://www.researcherid.com/rid/N-3138-2016>  
Svitlana Luchyk  <https://orcid.org/0000-0003-0757-1140>  
 <http://www.researcherid.com/rid/V-7133-2017>  
Yulia Manachynska  <https://orcid.org/0000-0001-9155-3417>  
 <http://www.researcherid.com/rid/S-7080-2017>  
Olena Androsenko  <https://orcid.org/0000-0001-8579-1283>  
 <http://www.researcherid.com/rid/B-2204-2017>

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Svitlana Luchyk, Yulia Manachynska,  
Olena Androsenko, 2020

Olena Fomina, Doctor of Science,  
Professor, Head of the Department of  
Accounting and Taxation, Department  
of Accounting and Taxation, Faculty of  
Finance and Accounting, Kyiv National  
University of Trade and Economics,  
Ukraine.

Olena Moshkovska, Doctor of Science,  
Professor, Department of Accounting  
and Taxation, Faculty of Finance and  
Accounting, Kyiv National University of  
Trade and Economics, Ukraine.

Svitlana Luchyk, Doctor of Science,  
Professor, Head of the Department of  
Accounting and Taxation, Department  
of Accounting and Taxation, Faculty  
of Accounting, Finance and Economic  
Activities, Chernivtsi Institute of  
Trade and Economics of Kyiv National  
University of Trade and Economics,  
Ukraine.

Yulia Manachynska, Candidate  
of Economic Sciences, Associate  
Professor, Department of Accounting  
and Taxation, Faculty of Accounting,  
Finance and Economic Activities,  
Chernivtsi Institute of Trade and  
Economics of Kyiv National University  
of Trade and Economics, Ukraine.  
(Corresponding author)

Olena Androsenko, Candidate  
of Economic Sciences, Associate  
Professor, Department of Accounting  
and Taxation, Faculty of Accounting,  
Finance and Economic Activities,  
Institute of Banking Technologies  
and Business, University of Banking,  
Ukraine.



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Olena Fomina (Ukraine), Olena Moshkovska (Ukraine), Svitlana Luchyk (Ukraine),  
Yulia Manachynska (Ukraine), Olena Androsenko (Ukraine)

# MANAGING THE CAPITAL FORCE IMPULSE OF THE AGRARIAN ENTERPRISE: TRANSFER APPROACH

**Abstract**

In the current conditions of globalization and European integration trends, domestic agricultural companies use the transfer pricing mechanism when exporting agricultural products, which on one hand allows owners to increase the efficiency of internal management, and on the other to hide real profits and reflect unprofitable production in financial statements. At the same time, traditional double-entry book-keeping and financial reporting (including those prepared in accordance with IFRS) are unable to show the real power momentum of domestic agricultural enterprises profitability (their return on capital). This narrows the circle of potential investors when making decisions on the feasibility of investing financial resources in the development of Ukrainian agricultural sector. The purpose of the study is to develop a 3D-form of the Actuarial Report on Capital Force Impulse (3D - ARCFI), which informational content will provide an objective assessment of the capital force impulse of an agricultural enterprise and help to attract investment in its development. The object of the study is the process of actuarial accounting and 3D reporting as information subsystems for controlling the capital power momentum at domestic agricultural enterprises. The research methodology is based on the application of 3D-recording method and classical mechanics methods in displaying information from the actuarial accounting system on 3D-force accounts to develop a model of power momentum management of an agricultural entity return on capital as an alternative approach to transfer pricing based on informational filling of 3D-ARCFI with the help of net profit method. The study results showed dependence of domestic agricultural enterprises investment attractiveness on the qualitative informational filling of the actuarial management reporting in 3D format. The practical value of the results received confirmed the effectiveness of the proposed 3D-model of profit power momentum management within the transfer approach based on accounting-informational basis of 3D-ARCFI, which will contribute to an objective perspective assessment of agricultural companies return on equity power momentum and increase their market investment attractiveness.

**Keywords**

capital, profit, impulse, force, investment, accounting,  
reporting, management, transfer pricing

**JEL Classification**

G32, H30, M41, Q14

**INTRODUCTION**

In the context of globalization, economic entities have begun to expand their geographical scope to find a way to maximize profits by minimizing expenditures and taxing cross-border trade using transfer prices. However, the use of transfer pricing mechanisms has, to some extent, created a conflict of interest among economic entities and may even lead to imbalances among economies. Therefore, it is relevant that such conflict situations be resolved through a compromise among the entities involved in the transfer pricing process.

Ukraine is a country with a small open economy. It has an export-commodity orientation. Both exports and imports have accounted for about 50% of GDP for many years.

The largest share in the structure of Ukraine's merchandise exports for 2019 is produced by AIC (agro-industrial complex), accounting for 44.3%, which is 4.9% more than the 2018 level. However, even with this rather significant share of agricultural products in the structure of Ukraine's merchandise exports, the activity of agrarian enterprises for 2019 became unprofitable for the first time in the last ten years (2009–2019). The damage amounted to UAH 43.3 million. The enterprises that received profits accounted for 50% of the total number of enterprises (financial result – UAH 286.6 million) and, respectively, 50% of the enterprises that received losses (i.e., UAH 329.9 million).

This situation can be easily explained by the macroeconomic aspect of transfer pricing, namely, by manipulating transfer prices, the company optimizes tax expenditures and maximizes its consolidated profits. Enterprises evade taxes (particularly income tax).

According to the official data given by the State Fiscal Service of Ukraine, more than 50% of Ukraine's merchandise exports were exported through third parties (frequently they were affiliated persons – founders and participants of the issuer (except shareholders who are not founders). The total volume of exports under indirect contracts was 260 billion USD. As a result, almost 30% of the goods' income remained outside Ukraine. The situation is not unique. Worldwide, USD 21 trillion have been offshored by such schemes.

It was because of these trends that the Verkhovna Rada of Ukraine adopted Law 465-IX on January 16, 2020 "On the introduction of amendments to the Tax Code of Ukraine on the improvement of tax administration, elimination of technical and logical inconsistencies in tax legislation" in the second reading. One of the main objectives of its adoption, as set out in the Explanatory Note, is to establish rules for the control of transfer pricing under the requirements of the BEPS Plan.

The BEPS Action Plan (Base Erosion and Profit Shifting) is a list of steps developed by the member states of the OECD and the G20 to prevent the erosion of the taxable base and the withdrawal of profit from taxation.

That is, Ukraine has joined the BEPS Plan, which is aimed at forcing companies to charge profits where value-added is created, and economic activity is carried out directly, not just registered enterprise. The global trend in combating tax evasion has been increasing in recent years. The most discussed novella is the introduction of a three-tier reporting system. In addition to the report on controlled operations (local file), there is provision for the submission of a master file and a country-by-country report.

Direct investment in Ukraine in 2019 amounted to USD 32,905.1 million, which is USD 1,298.7 million (or 4.1%) higher than the level of 2018 and USD 6,087.8 million less than the same figure in 2010, as of December 31, 2019, direct investment in Ukraine amounted to USD 35,809.6 million. An assessment of foreign direct investment inflow to Ukraine by type of economic activity showed that its share in agriculture, forestry, and fisheries is the lowest among all branches of the economy, being only 3.2% of the total amount of foreign direct investment in Ukraine, which in absolute amount is USD 81.6 million. The negative financial results of the industry indicate the need to attract additional investment resources.

It is worth noting that an investor decides to temporarily invest free financial resources in agrarian enterprises based on accounting information compiled in the financial reporting system (including consolidated financial statements) composed under IFRS. However, in reality, the real commodity potential of the industry, even with the actual negative financial results in the reporting year, is substantial, almost impossible to highlight through the lens of financial reporting fully. Financial statements are based on the facts of past events. They do not contain information about the power impulse of the agrarian enterprise capital profitability in the short term. One way to overcome this crisis in the research sector for agrarian enterprises is to introduce a Force Report on Capital Impulse. This report is viewed in the context of a three-tiered spatial interpretation of the accounting information from the actuarial accounting system, such as the three-tier structure for transfer pricing reporting.

# 1. LITERATURE REVIEW

Research on the content of transfer pricing at the micro and macro levels and the use of its data for management with profitable business potential is the work of many scientists, in particular Brehov, Koshuk, Novitskaya, et al. (2019), Cherevko (2014), Karpenko (2018), Lokhanova (2018), Poslavska and Yasyshena (2017), Suk (2020), Zhao (2017), Shevchenko (2020) and others. In particular, Cherevko (2014) mentions that transfer pricing is a method of redistributing resources and optimizing taxation, which affects the distribution of income, profits, risks, and quality of life. According to the scholar, the transfer pricing management process itself is intended to ensure better coordination and regulation of intra-business linkages, reduce aggregate costs, and increase employee motivation. In particular, Oswald (2014) among the main functions of transfer prices differentiates precisely the accounting function. The scientist thinks it is essential.

The accounting function is vital for both levels of transfer price use (micro and macro), as data on deduction and calculation of costs are supplemented, starting with a subsidiary in one home country of the company and finishing with the consolidation department of the parent company, optimizing the activity of the company.

In the writings of Shevchenko (2020), the introduction of a three-tier reporting structure for transfer pricing is proposed, in line with Step 13 of the BEPS Plan. Step 13 of the BEPS Plan provides 1. Master file (Global Transfer Pricing Documentation) is submitted to the taxpayer's supervisory authority, a member of the international group of companies, if specific criteria for the total consolidated income of such an international group are met. The local file (Controlled transaction report) analyzes the particular transfer correspondence pricing concerning the local taxpayer's significant transactions. It also provides a country-by-country report submitted by the country's resident taxpayer of the country, belongs to an international group of companies if certain conditions stipulated by the country's domestic law are met.

In the digitalization of all social and economic spheres in society, the traditional double account-

ing that urgently needs to be supplemented by new accounting is the third actuarial measurement. For the first time, Cronhelm (1818) introduced a non-standard three-dimensional approach to the spatial interpretation of an accounting system. The scientist singled out triple (3D) production accounts for the generalization of natural indicators on them. They were considering the improvement of the accounting subsystem through the lens of triple accounting (3D record) and the three-tier reporting structure for the practical business management that is presented in the works of Samusenko (2013), Karelskaya and Zuga (2015), Legenchuk (2012), Ezersky (1873), Grigg (2005), Grigg (2005), Odintsova and Ruta (2018), Ijiry (1989), and others. In particular, Odintsova and Ruta (2018) note that, in the context of the information society and the digital economy, several prerequisites are emerging for the formation of a new accounting paradigm. However, the ideas of scientists, which are defined in the scientific literature as new paradigms of accounting, in our opinion, are only conceptual. In practice, investors and managers are increasingly using data, alternative financial accounting information, or modified indicators such as Economic Value Added (EVA), Balanced Scorecard (BSC) as well as the initial and final profit impulse (FPI), the force impulse of Capital (SIC), the profit margin impulse (PMI), etc.

Ezersky (1873) strongly condemned the Italian accounting concept, i.e., traditional double-entry bookkeeping, and proposed his own three-dimensional accounting system. According to the scientist, double-entry bookkeeping in agriculture leads to distortion of final financial results. While the use of the triple accounting system developed by him, with only three accounts, "cash," "value," and "capital," increases the potential for agricultural sector development. Dobija (2015) suggests using physical terms "potential" and "force" in the accounting system to improve the efficiency of business management. The authors completely agree with this scientist's approach, because only at the junction of different disciplines, particularly "physics" and "accounting," a completely new innovative accounting concept can be formed. The approaches of Ijiri (1989) who first proposed to expand the basic model of double entry by adding a third dimension to it, constitute the basis of research on the development of innovative "force accounts" by Dobija (2015).

The same opinion is held by Samusenko (2013) who believes that traditional double-entry needs to be expanded to the third dimension while preserving the fundamental principles of accounting. It should be noted that it was Ijiri (1989) who first suggested the use of physical terms “work” and “momentum” in the accounting system. According to the scientist’s approach, “momentum” is integrated into the financial result, and the work is integrated into what connects it with the financial result for the period. According to the scientist, triple accounting cannot be based on a standard accounting unit. It is a fact of economic activity. This unit should be broken down into the following three components: “momentum,” “force,” and “operation.” Besides, the scientist’s research works provide the forms of accounting that can be compiled in the system of triple accounting, namely: Capital Report, Momentum Report, and Power Report. In our opinion, these reports should be accumulated into one 3D reporting form, which should contain three sections and reflect the “capital force impulse” of an enterprise.

Thus, the main innovation of the three-dimensional accounting model is the maintenance of three levels of accounts: capital, momentum, and power, which are generalized in reporting, that in our opinion, should also be of a three-level format (3D).

The authors support this scientist’s approach and believe that it is necessary to use a combination of two physical terms “force” and “momentum” in one category “force impulse” to build an effective system of business profitability management regardless of the economic sector, agriculture included. The application of physical terms “force” and “momentum” in the management system is present in the scientific works of Cheverton (2018), McManus, White, and Botten (2018), Kotter, Kim, and Mauborgne (2011), Studebaker (2015). In particular, Cheverton (2018) notes that effective account management requires creating a global accounting strategy to make decisions and achieve the desired level of business profitability.

Since financial and economic activity includes several operations, its force impulse management will increase the efficiency of capital management. After all, in today’s conditions, the capital and its changes are the subjects of the company’s accounting. Therefore, it is advisable to introduce the term

“capital force impulse management” into the practice of agrarian enterprises. Since the domestic agricultural sector has negative financial results in the reporting year, it is quite reasonable to introduce an innovative system of profitability management based on the accounting content of the three-tier reporting structure. This approach will increase the level of investment attractiveness of domestic agrarian enterprises in the world arena.

The term “financial reporting in 3D” first appears in the scientific works of Golden (2017). Unlike traditional approaches, financial reporting in 3D involves assessing the consequences of “business operations” of an enterprise at three levels: Balance Sheet (Statement of Financial Position), Statement of Financial Performance (Statement of Comprehensive Income), and Statement of Cash Flows. This approach reflects changes in reporting without compiling traditional accounting entries.

The first 3D actuarial accounting model appears in the scientific works of Yevdoshchak (2016). The scientist suggests using the 3D accounting model to create a favorable information environment to attract financial investment into domestic business development, which will help the economy out of the crisis.

The authors fully support the approaches of the scholars mentioned earlier. They believe that the traditional double accounting and actuarial accounting paradigm, as one of its sub-types, in the light of the digital economy initiates, at the theoretical level, the emergence of new types of accounting. In particular, actuarial accounting contributes to the expansion of the traditional two-dimensional (2D) methodical instrumentation in the third dimension (3D) with the discovery of 3D force accounts and actuarial reporting at 3D. The authors believe that it is actuarial reporting that will assess the force impulse of return on capital in the short term in terms of the use of transfer pricing methods by enterprises.

## 2. RESEARCH PURPOSE

The research aims to develop the “Actuarial Force Report on Capital Impulse” (3D-ARCFI) to determine the real power potential of agrarian enterprises in Ukraine, increasing the efficiency of their business and investment attractiveness.

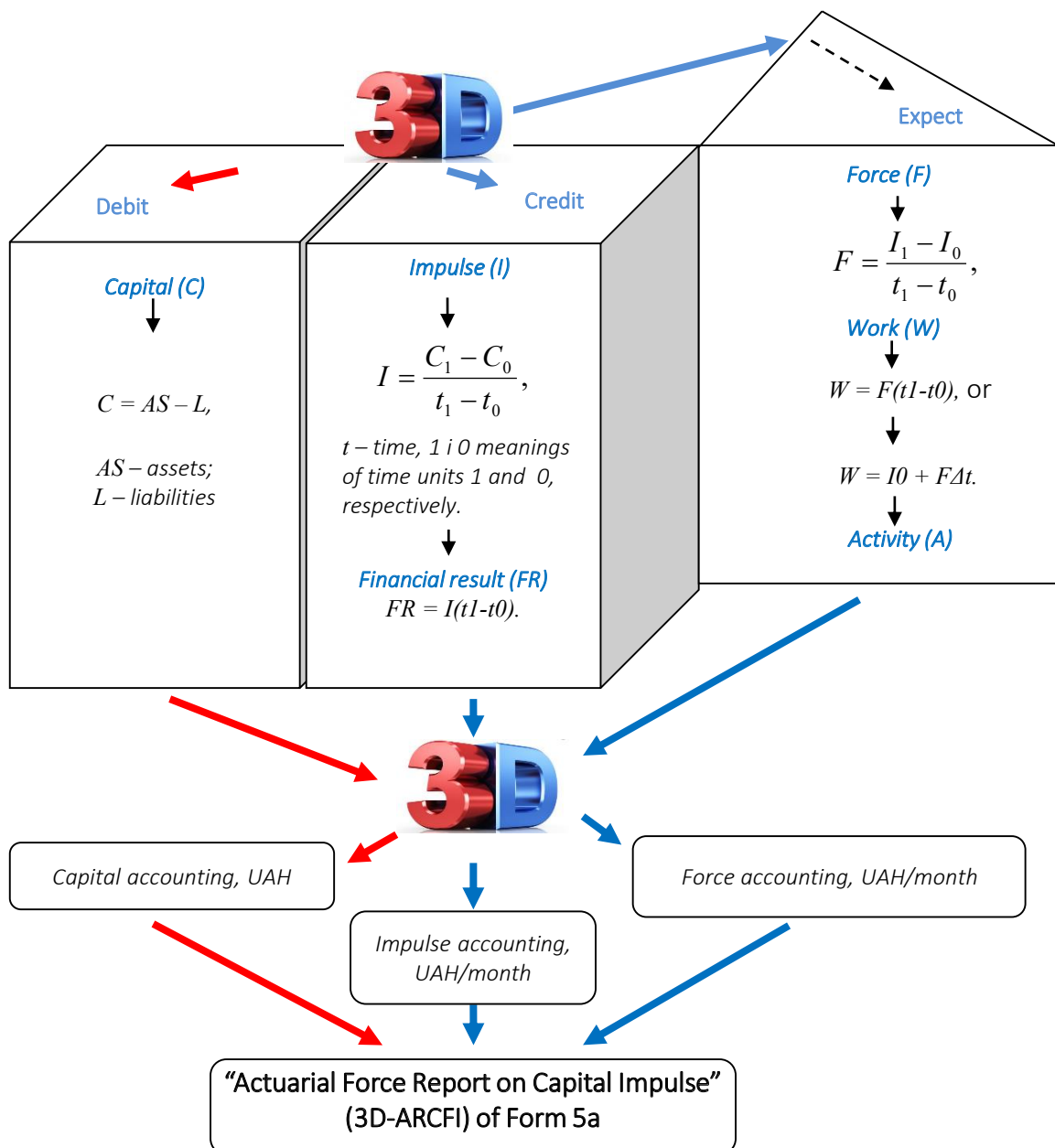


### 3. RESEARCH METHODS

To study the theoretical basis and methodological approaches to assessing capital force impulse of an agricultural enterprise on the grounds of the Actuarial Report on Capital Force Impulse (3D - ARCFI) informational basis, the following methods were used: actuarial accounting methods – 3D-recording (projected: debit, credit, expect) and 3D-force accounts (to display accounting information from the actuarial accounting

system and its subsequent generalization from the triple accounting in the proposed actuarial management reporting form); mathematical methods of classical mechanics with such basic concepts as force, momentum and work (to substantiate the structure of 3D-actuarial force accounts in 3D-accounting system). 3D force accounts in contrast to traditional accounting T-accounts, consisting of two parts: “debit” and “credit,” have 3D projection – “expect.” The detailed structure of the proposed 3D accounts is shown in Figure 1.

Source: Developed by the authors based on Ijiri (1989).



**Figure 1.** Rationale for the construction of 3D actuarial force accounts in the system of 3D accounting

As can be seen from Figure 1, in the debit of 3D – the force account information about the capital (C), which is later generalized through the lens of the accounting registers in the first section of Form 5 of the Actuarial Management Reports “Capital Balance.” Credit displays the accounting information about the impulse (I) and the financial result (FR), which at the end of the accounting cycle finds the generalization in Section II of the “Actuarial Force Report on Capital Impulse” (3D-ARCFI) of Form 5a. The expect displays the force, work, and business operations are generalized in the III section “Force” 3D AFRCI.

The authors propose a third dimension for the 3D force accounts to be called the “Expect” (from the lat. “Expectandum” – “expect”) - which by its meaningful content reflects the prospective trends of changes of the objects of the triple actuarial accounting. “Expect” accumulates in itself such indicators as force, work, and economic operations. This part of the 3D force accounts reflects individual factors (transactions, activities, events) that drive the rate of change in income and expenditure.

The positive sums in the accounts of “Expect” are the results of the activity (actions) which lead to an increase in income and a decrease in expenditure, while the negative sums are the same or other actions which reduce revenue and increase spending (i.e., encourage the opposite trend). That is “Expect” is the new 3D level of actuarial force accounts (details of active accounts). The balance of the expect reflects the final work of the Force (F), while the turnover of the expect accounts demonstrates the change in impulse (I). In such reports, the treatment of debits and credit is fundamentally changed. To combine these three components: Debit, Credit, and Expect, one takes into account the established duration of the accounting period, for example, month.

To achieve the purpose of the study, a set of scientific methods has been used: scientific generalization and comparative methods (to determine the role of the Report on Capital Force Impulse (3D-ARCFI) and to conclude the urgent need for its implementation in the agricultural sector to increase the sector investment attractiveness); computation-analytical and graphical methods (used to

compile tables and graphs, perform calculations and generate research results), methods of analysis and synthesis (used to identify the main benefits of the actuarial management report 3D- ARCFI usage as an informational basis in managing the capital power momentum to estimate the relevant range of Ukrainian agricultural enterprises profitability level, financial and actuarial reporting at Ukrainian agricultural companies); alternative Transactional Net Margin Method - TNMM (for setting transfer prices at domestic agricultural enterprises and comparing the relevant financial profitability indicator in a controlled transaction (net profit based on the relevant base (costs, sales, assets) or operating costs profitability indicator with corresponding profitability indicator in comparable uncontrolled operations); modeling (for the development of 3D-informational-analytical model of profit power impulse management); method of generalization (for research results systematization and formulation of conclusions).

The article pays special attention to the development of a management model for an agricultural entity profitability force impulse as part of an alternative approach to transfer pricing based on the information content of the actuarial management report on the capital force impulse (3D- ARCFI) with the help of net profit method. In general terms, the relationship between capital, impulse, and force can be described in a conventional three-tier factor model (Figure 2).

The investigated object is located at the first level (e.g., profit from sales of finished agricultural products). At the second level, one deals with additive elements, net component income from sales, and objects of expenditure. At the third level, there are the most important factors that change each of the features at the second level, that is, the model will have a tree-like structure.

For the first time, it is proposed to introduce the practice of application in the agricultural sector, such an essential element of management for agrarian enterprises as “force profit impulse management (FPI – Force Profit Management)”:

Profit Impulse Management (PIM) is the process of applying forms, methods, and procedures to measure the change in the capital of an enterprise

Source: Developed by the authors.

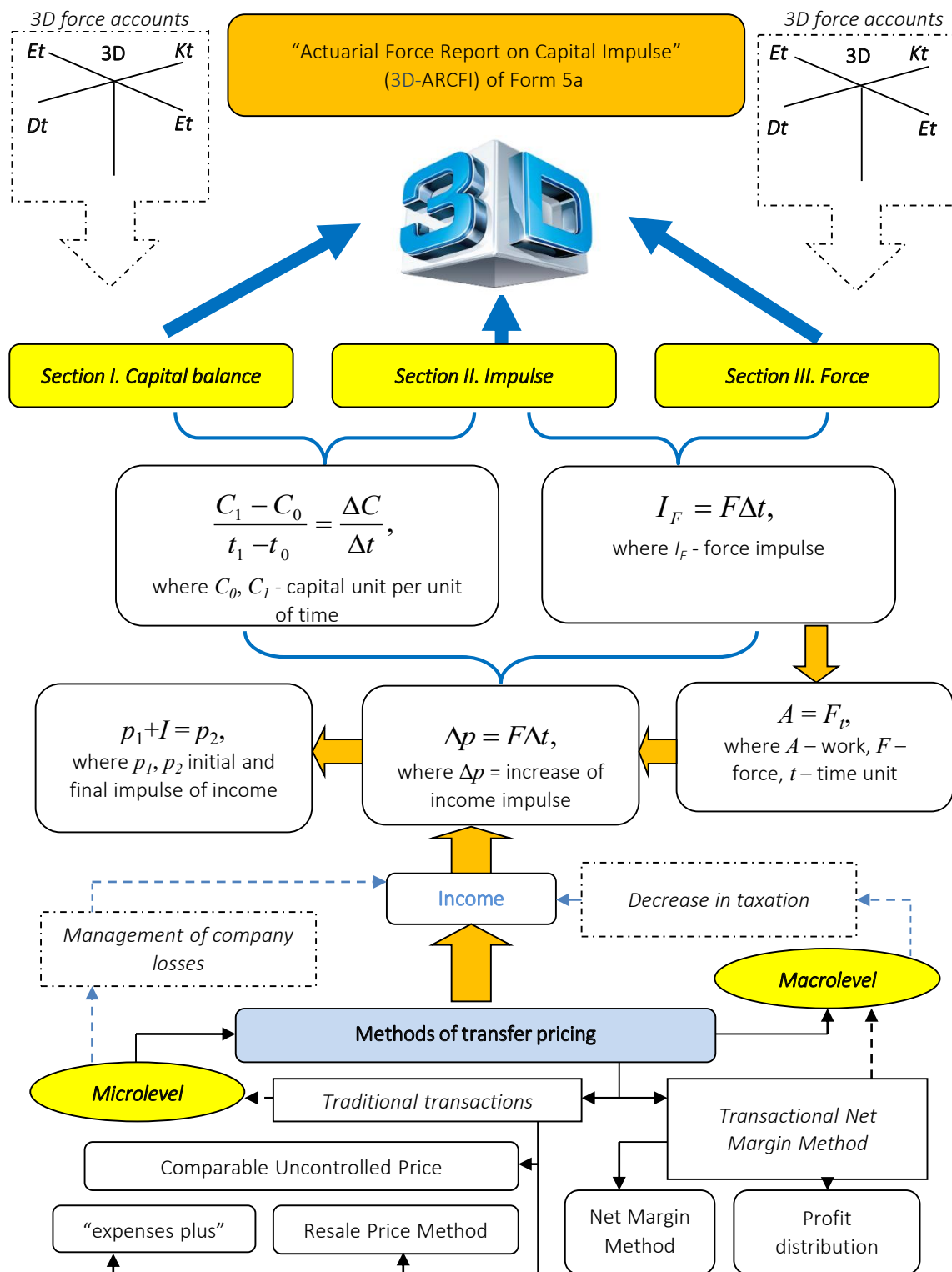


Figure 2. Profit force impulse management model: transfer approach

in monetary units per unit of time (hr. units/day; hr. units/day, etc.). PIM provides managing the impulse of an enterprise's ability to make a profit at any one point in time. The authors propose

building PI management subsystem information filling based on the increased dimension of traditional accounting systems to the 3D format of actuarial management accounting. It will ensure the



identification of real and potential changes in the force “impulse” profit of the agrarian enterprise and the rate of growth (increase) of income, expenditure, and capital.

Methodological tools for calculating potential “force” and “impulse” are offered to be borrowed from the system of mathematical methods of classical mechanics, complementing the modern actuarial accounting paradigm.

## 4. RESULTS

It is necessary to create favorable information content of the reports, which would interest a real and potential investor through the lens of its content, to overcome the samples examined and increase the level of investment attractiveness of the domestic agricultural sector of Ukraine, for the first time in the last ten years it has become unprofitable. Moreover, it will reflect the prospective forceful impulse of capital growth and profit of the company with actual negative financial results. Besides, there is a need for reporting, providing the right information basis for alternative transfer pricing methods to determine the cost-effectiveness impulse of capital.

The authors have proposed supplementing the actuarial management reports in a separate form of 5a “Actuarial Force Report on Capital Impulse” (3D-ARCFI), which contains three sections. These reporting forms were considered in the system of triple accounting by Ijiri (1989). In our opinion, it is expedient to present “balance and capital,” “impulse,” and “force” in one report, to reflect the prospects of changing the force potential of profit of the agrarian enterprise as a whole. It is proposed to complete 3D-ARCFI I based on the actuarial 3D force accounts.

At the beginning and end of the month, the agrarian enterprise has different capital values, which can be seen in the balance of debit accounts. Capital gains, the financial result, is the turnover of debit accounts. But it must also correspond to the amount of turnover according to the expert transaction account (action). Accordingly, summing all the impulses for the period, one gets the financial result. Similarly, summing up all the in-

fluence of forces on the expert, one gets a change in impulse, and through impulse integration, one understands the financial result.

For example, the authors will use the data of the public financial statements of the agrarian enterprise PAO “Agribusiness “Provesin” (Lviv) as it functions in the crop sector. It specializes in the cultivation of cereals and industrial crops, trade in fruits and vegetables, and potatoes in particular exports. The initial capital of PAO “Agribusiness “Provesin” was UAH 2,441 thousand, of which cash was UAH 125 thousand, inventories were UAH 1,832 thousand, receivables were UAH 872 thousand, accounts payable was UAH 387 thousand.

The initial impulse of the financial result, which reflects the baseline forecast of sales and expenditures in the first month of operation was 147 thousand/month, including net income from the sale of agricultural products – 483 thousand, the cost of agricultural products sold – 261 thousand, marketing costs – 90 thousand.

In the conditions when PAO “Agribusiness “Provesin” plans in the reporting period (the first month) to increase deliveries for export, i.e., the scale of the market of agricultural products, and correspondingly expects an increase in sales of agricultural products. For this purpose, the analytic subsystem of actuarial accounting opens a 3D account of the force of 1012511 “Expenditures on the expansion of the market.” A second key factor in the potential change in agribusiness’s final financial result is the growth of a new type of agricultural product, which also affects the force of changes in income and expenditure (second month). In this case, the analytic account 1010131 “New agricultural production” is opened in the 3D force account system. The 3D accounting level is the accounting of force (F) under the results recording (of the work A) of the economic activity of PAO “Agribusiness “Provesin” under the action of the factors will be fixed on the number of 3D force expect accounts. Accordingly, the impulse I and the increase (decrease) in income and expenses will be recorded on credits of level 2D accounts (impulse accounting). At the initial level in the triple actuarial accounting system (capital accounting), the described changes will be recorded in the accounts of group 1010: net operating assets (liabilities) (Table 1).

**Table 1.** Calculating the force impulse of capital through the lens of 3D force accounts

Source: Developed by the authors based on SMIDA (2020) and Samusenko (2013).

3D force accounts	Initial impulse	3D force accounts		Final impulse	Capital accounts				
		101010131 “New agricultural production”	1012511 “Expenditures on the expansion of the market”		101011 “Operating cash”	101012 “Calculations with different debtors”	1013 Reserves	101021 “Payments to suppliers and contractors”	102111 “Capital at the beginning of period”
1 <sup>st</sup> month									
102111 “Capital at the beginning of period”	–	–	–	–	125	872	1,832	387	2,441
Group 1011 “Revenues and results of operations”									
101111 “Net income from agricultural products”	483	132	99	724	296	451	–	–	724
101221 “Cost of agricultural products sold”	–261	73	58	–392	–	–	–392	–	–392
10125 “Sales costs”	90	30	15	–137	–	–	–	–137	–137
101121 “Net financial result”	147 thousand UAH/month	24	24	195	–	–	–	–	195
Group 1010 “Net operating assets (liabilities)”									
101011 “Operating funds”	–	–	–	–	–	–	419	–419	–
101012 “Calculations with different debtors”	–	–	–	–	748	–503	–	–	–
101021 “Payments to suppliers and contractors”	–	–	–	–	–290	–	–	329	–
Turnover of accounts	–	–	–	–	458	–52	27	–227	195
Account balance	–	–	–	–	583	820	1,859	160	2,636
2 <sup>nd</sup> month									
102111 “Capital at the beginning of period”	–	–	–	–	583	820	1,859	160	2,636
Group 1011 “Revenues and results of activities”									
101111 “Net income from agricultural products”	724	3,913	2,609	7,246	1,128	2,681	–	–	7,246
101221 “Cost of agricultural products sold”	–392	–6356	–3,202	–9,950	–	–	–9,950	–	–9,950
10125 “Sales costs”	–137	–510	–205	–852	–	–	–	–852	–852
101121 “Net financial result”	UAH 195 thousand / month	–1,181	–2,570	–3,556	–	–	–	–	–3,556

**Table 1 (cont.).** Calculating the force impulse of capital through the lens of 3D force accounts

3D force accounts	Initial impulse	3D force accounts		Final impulse	Capital accounts				
		101010131 “New agricultural production”	1012511 “Expenditures on the expansion of the market”		101011 “Operating cash”	101012 “Calculations with different debtors”	1013 Reserves	101021 “Payments to suppliers and contractors”	102111 “Capital
Group 1011 “Revenues and results of activities”									
101011 “Operating funds”	–	–	–	–	–	–	3,560	–3,560	–
101012 “Calculations with different debtors”	–	–	–	–	390	–390	–	–	–
101021 “Payments to suppliers and contractors”	–	–	–	–	–975	–	–	–975	–
Turnover of accounts	–	–	–	–	543	2,291	–6,390	1,444	–3,556
Account balance	–	–	–	–	514	985	2,697	–429	3,697
Force at the end of the period	–	UAH 79 thousand / month	UAH 181 thousand /month	–	–	–	–	–	–
Work (impact on impulse)									
1 <sup>st</sup> month	–	15	15	–	–	–	–	–	–
2 <sup>nd</sup> month	–	79	181	–	–	–	–	–	–
Total	UAH 790 thousand/ month	93	196	1,079	–	–	–	–	–
Transactions (impact on capital)									
1 <sup>st</sup> month	UAH 147 thousand	15	15	177	Capital at the beginning of the period				2,441
2 <sup>nd</sup> month	UAH 790 thousand	93	196	1,079	Capital at the end of the period				3,697
Total	UAH 937 thousand	108	211	1,256	Capital gains				1,256

According to the approach of Ijiri (1989), the force potential over the period during which it remains constant is influenced by the impulse or work (A). In other words, work is the integral effect of economic transactions on agrarian enterprises' growth rate. A transaction itself is the product of work over the period during which the value of the work (and the force, respectively) remains constant.

In Table 1 and Figure 2, one can see that at PAO "Agribusiness "Provesin," on condition of expansion of agricultural product markets and growing of new impulse types by the beginning of the second month will be UAH 790 thousand/month, which will ensure that the agrarian enterprise receives income from the sale of agrarian products of UAH 12,008 thousand. The integral influence of force on capital or the work will make UAH 289 thousand, and the financial result will be UAH 1,256 thousand.

In general, the content of the desired or 3D actuarial accounting system characterizes the following equation:

$$\Delta 3D \text{ accounts} = \Delta \text{income} - \Delta \text{costs} = \Delta \text{financial results.} \quad (1)$$

Accordingly, the authors have proposed a separate Management Actuarial Reporting of Form 5 to supplement the financial reporting of data to reflect the force gain in the financial result ( $\Delta \text{financial results}$ ) in 3D projection. It is compiled in addition to financial statements according to 3D force accounts from the triple actuarial system called "Actuarial Force Report on Capital Impulse" (3D-ARCFI) of Form 5a. The authors will also compile the reports mentioned earlier on the accounting data for several agrarian enterprises of Ukraine, namely for PAO "Agribusiness "Provesin" (Lviv), PAO "Agribusiness named after H.S. Skovoroda" (Kharkiv region, Zolochiv district, Skovorodynivka village) and PAO "Agribusiness "Verbivske" (Kharkiv region, Balakliia district, Verbivka village) (Table 1). It is worth mentioning that selected agribusiness companies have different final financial results, both positive and negative. In particular, the activity of PAO "Agribusiness "Provesin" is unprofitable, the absolute amount of loss for the reporting period

is UAH 3,556 thousand, and the actions of PAO "Agribusiness named after H.S. Skovoroda" and PAO "Agribusiness "Verbivske" were profitable, the positive net financial result was UAH 25,831 thousand and UAH 4,605 thousand respectively.

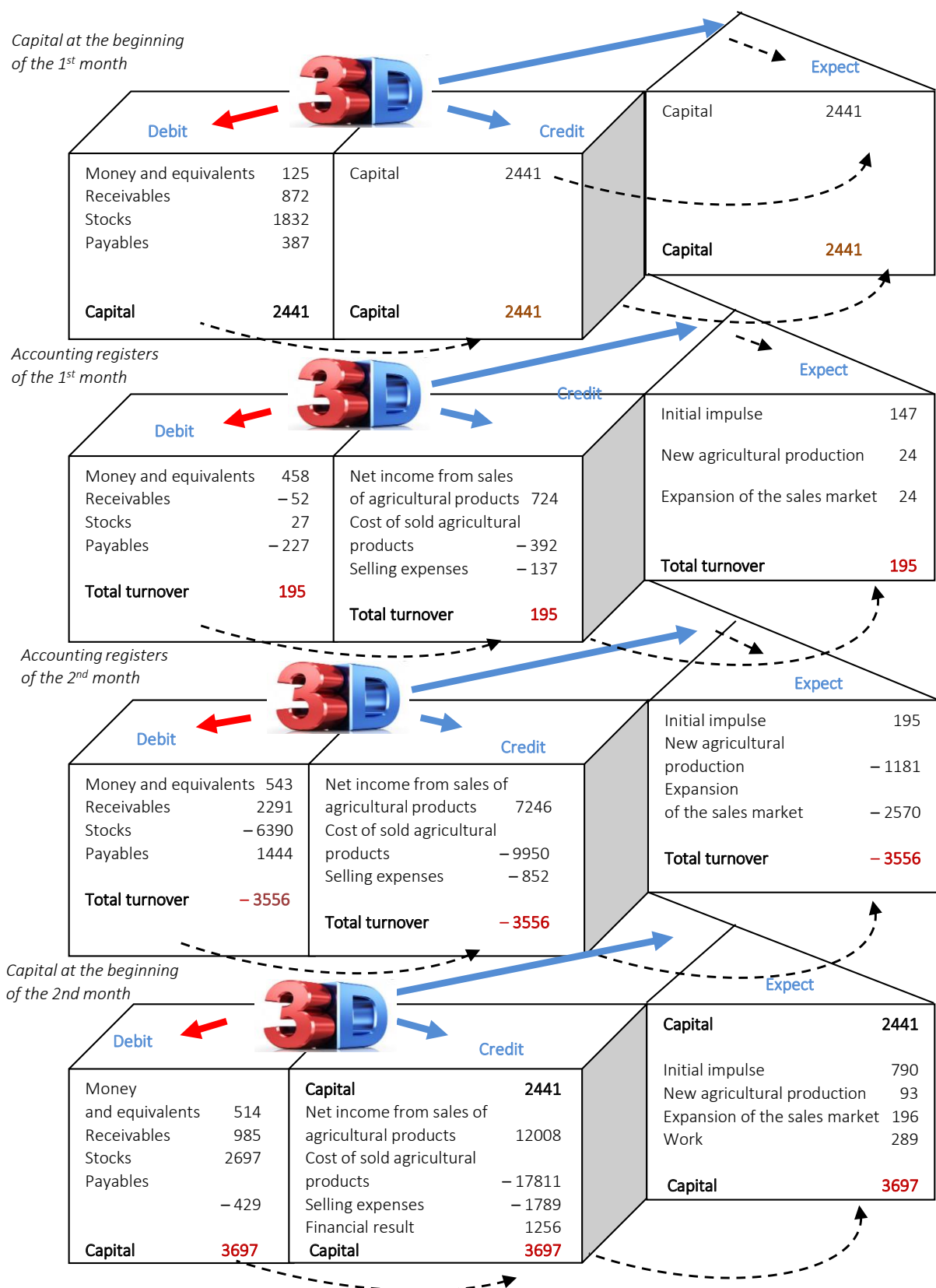
From the given Table 1, the proposed form of actuarial management reporting allows us to see the hidden potential of the profit force impulse, even for the unprofitable agrarian enterprise of PAO "Agribusiness "Provesin".

Thus, at PAO "Agribusiness Provesin" the force (balance at the end of the period) will be UAH 280 thousand/month, that is, according to the articles for "New Agricultural Production" – UAH 79 thousand/month, "Increase of supply for export" – UAH 181 thousand/month. The result of the force over the period during which it remains constant (2 months) gives the integral effect of the force on the impulse – UAH 576 thousand or a work. The prospective absolute sum of the net financial result at the end of the second month is UAH 1,256 thousand, even with initial losses. At PAO "Agribusiness named after H.S. Skovoroda," the force will be UAH 2,605 thousand /month, the work – UAH 4,121 thousand, and the financial result in the promising second month – UAH 24,302 thousand.

For PAO "Agribusiness "Verbivske," force – UAH 2,133 thousand/month, work – UAH 4,121 thousand, and profit – UAH 24,621 thousand. So, according to the "Actuarial Force Report on Capital Impulse" (3D AFRCI) of Form 5a, the investor has the opportunity to see the hidden capital impulse in a promising short period (in our example, two months), even with initial losses. Thus, in the agrarian enterprise, it is necessary to establish a procedure for collecting, systematizing, and presenting information on transfer pricing, by recording the transfer prices in the 3D force accounts and the accounting registers of the triple actuarial accounting.

It is expedient to generalize such information in the formation of reporting on transfer pricing and actuarial management reporting in 3D to external users under current legislation to form a favorable information content to attract foreign investment in the development of the industry.

Source: Developed by the authors based on SMIDA (2020) and Samusenko (2013).



**Figure 3.** 3D projection of the force impulse of the capital balance of PAO "Agribusiness "Provesin"



Karpenko (2018) mentions that the accounting of transfer pricing requires compliance with the requirements of approved legal instruments and the supervisory authorities' instructions. That is because the application of transfer prices has a significant impact on the calculation and timely payment by an income tax enterprise. Accounting also addresses the need for internal information for the transfer price process. Applying the appropriate transfer pricing method in an agrarian enterprise of a corporate type can occur at the stage of planning and forming the transfer price. It can also be implemented at the verification of transfer prices for compliance with the principle of "extended hand" and transfer pricing reporting.

The transfer price determination in controlled transactions on the principle of "extended hand" provides the use of one of the methods: Comparable Uncontrolled Price – CUP, Resale Price Method – RPM, Cost Plus Method – CPM, Transactional Net Margin Method – TNMM, Profit Split Method – PSM. It is proposed to use the accounting content "Actuarial Force Report on Capital Impulse" (3D-ARCFI) of Form 5a when establishing transfer prices in domestic agrarian enterprises. It is also proposed to apply an alternative method of transfer pricing by the Transactional Net Margin Method – TNMM.

Based on the data summarized in the form 3D AFRCI for the surveyed agrarian enterprises (Table 2), the authors apply the net margin method for estimating the force impulse of profitability of capital, the results of these calculations are generalized in Table 2.

Decisions of current and potential investors to buy, sell, or maintain equity instruments depend on:

- the potential level of return they expect to receive from investments in these instruments;
- estimates of the prospects for future net cash inflows from the entity;
- information on the management staff duties performance (enterprise management system), conceptual basis of financial reporting (IASB, 2019).

Accordingly, the proposed methodological tool in the form of the Actuarial Force Report on Capital Impulse (3D AFRCI) can meet investors' information needs on the prospective force potential of agrarian enterprises, from the maintenance of equity instruments. In particular, Section II "Impulse" 3D-ARCFI contains detailed information as to the impact impulse on performance results capital of an agrarian enterprise. Section III "Force" accumulates information about capital gains and financial results, taking into account the impact of initial and final impulses on work.

There is no duplication of information in the forms 5a and 5, as the traditional Equity Statement (form 5) accumulates information on changes in the enterprise equity during the reporting period and does not contain generalized accounting data on the impact of business transactions on capital taking into account the "force impulse."

"3D ARCFI" does not duplicate, but summarizes the main accounting objects of the Actuarial Balance (Form 1a), namely lines 8000 – 8100 of the Report "3D ARCFI" and the Actuarial Report on aggregate income (Form 2a), (lines 8150 – 8225), respectively, due to which the investor sees the prospective tendencies of the impact momentum of business transactions on capital immediately.

The application of the 3D AFRCI by agrarian enterprises will increase the investment attractiveness of the Ukrainian agricultural sector. This is because the investor will immediately see the capital force impulse potential, even when the initial financial results might be negative.

This form of reporting can be used for any economy sector entity. In this study, the agricultural sector has been chosen because unprofitable financial results characterize this industry for the first time in the former ten years. Therefore, Ukraine's agriculture needs to overcome the negative crisis trends and attract the necessary amount of investment for its development. In our opinion, a three-tier approach to reporting based on the reflection of the capital force impulse in the short run can contribute to this.

The actual financial position and performance are very low for a foreign investor, reflected in the eco-

**Table 2.** “Actuarial Force Report on Capital Impulse” (3D AFRCI) of Form 5a

Source: Developed by the authors based on SMIDA (2020) and Samusenko (2013).

I. Capital balance sheet							
Article	Code lines	End of period (2 <sup>nd</sup> month)					
		PAO “Agribusiness“Provesin”		PAO “Agribusiness named after H.S. Skovoroda”		PAO “Agribusiness “Verbivske”	
Money and its equivalents	8000	514		2,579		7	
Accounts receivable	8005	985		11,589		3,904	
Supply	8010	3,662		37,422		42,740	
Payables	8050	429		100		19,774	
Capital	8100	4,732		51,490		26,877	
II. Impulse							
Article	Code lines	Impulse: end-of-period balance, thousand UAH/month			Impulse: impact on capital, thousand UAH/month		
		PAO “Agribusiness “Provesin”	PAO “Agribusiness named after H.S. Skovoroda”	PAO “Agribusiness “Verbivske”	PAO “Agribusiness “Provesin”	PAO “Agribusiness named after H.S. Skovoroda”	PAO “Agribusiness “Verbivske”
Net income from agricultural products	8150	7,246	77,060	78,084	13,043	138,708	140,551
Cost of agricultural produce sold	8200	(9,950)	(51,075)	(70,634)	(17,811)	(91,424)	(126,435)
Marketing costs	8205	(852)	(154)	(2,845)	(1,789)	(323)	(5,975)
together	8225	(3,556)	25,831	4,605	(6,557)	46,961	8,141

**Table 2 (cont.).** “Actuarial Force Report on Capital Impulse” (3D AFRCI) of Form 5a

Article	Code lines	II. Force								
		Force: end-of-period balance and work: impact on impulse, thousand UAH/month			Work: impact on impulse, thousand UAH/month			Economic operation: impact on capital, thousand UAH/month		
		PAO “Agribusiness “Provesin”	PAO “Agribusiness named after H.S. Skovoroda”	PAO “Agribusiness “Verbivske”	PAO “Agribusiness “Provesin”	PAO “Agribusiness named after H.S. Skovoroda”	PAO “Agribusiness “Verbivske”	PAO “Agribusiness “Provesin”	PAO “Agribusiness named after H.S. Skovoroda”	PAO “Agribusiness “Verbivske”
New agricultural products	8240	79	838	949	213	2,263	2,292	108	3,603	3,651
Scaling up markets	8250	181	929	1,284	363	1,858	2,568	211	2,787	3,852
Impulse at the beginning of the period	8270	–	–	–	790	8,380	8,490	1,079	13,408	13,584
Impulse at the end of period	8275	–	–	–	1,079	13,408	13,584	–	–	–
Net financial result	8280	–	–	–	–	–	–	1,256	24,302	24,621
Capital at the beginning of period	8290	–	–	–	–	–	–	2,441	27,188	2,256
Capital at the end of period	8300	–	–	–	–	–	–	3,697	51,490	26,877

**Table 3.** Estimation of capital cost-of-living impulses in the context of the net margin method

Source: Developed by the authors based on SMIDA (2020).

No.	Indicator	PAO “Agribusiness “Provesin”			PAO “Agribusiness named after H.S. Skovoroda”			PAO “Agribusiness “Verbivske”		
		Impulse: balance at end of period, thousand UAH/month	Impulse: impact on capital, thousand UAH	Business Operation: Impact on Capital, thousand UAH	Impulse: balance at end of period, thousand UAH/month	Impulse: impact on capital, thousand UAH	Business Operation: Impact on Capital, thousand UAH	Impulse: balance at end of period, thousand UAH/month	Impulse: impact on capital, thousand UAH	Business Operation: Impact on Capital, thousand UAH
1	Net income from agricultural products	7,246	13,043	–	77,060	138,708	–	78,084	–	–
2	Net financial result	–5,767	–	1,256	21,641	–	24,302	92	–	24,621
3	Capital at the beginning of period	2,757	–	2,441	78,296	–	27,188	–79,534	–	2,256
4	Capital at the end of period	–3,010	–	3,697	99,937	–	51,490	–79,442	–	26,877
5	Average cost of capital	–2,884	–	3,069	89,117	–	39,339	–79,488	–	14,567
6	Net profitability	–79.6	–	–	28.1	–	–	0.12	–	–
7	Profitability of capital	199.9	–	–	21.7	–	–	–0.12	–	–
8	Impulse of return on capital	–	17.6	–	–	17.5	–	–	31.5	–
9	Force impulse of cost-effectiveness at the end of period	–	–	63.9	–	–	61.8	–	–	169.0

conomic (consolidated) picture IFRS reporting. An external user always seeks to assess the force of the potential for changes in the profitability of agrarian enterprise capital over time.

From Table 3, one can see that the profit impulse at PAO "Agribusiness "Provesin" is 17.6%, and the force impulse reaches 63.9%, the difference between impulse and force potential is 46.3%. At PAO "Agribusiness named after H.S. Skovoroda," the impulse of profitability is almost identical (the difference is 0.1%), and less force impulse of capital profitability, which is 61.8% (the increase is 15.5%). At the same time, the initial financial results of this agrarian enterprise were positive, in contrast to PAO "Agribusiness "Provesin." While at PAO "Agribusiness "Verbivske," the rate of capital profitability is twice as high as in both previous agrarian companies and is 31.5%.

The real investor will be interested in PAO "Agribusiness "Verbivske," and despite the loss-making activity of PAO "Agribusiness "Provesin." So, the proposed Form 5a to the actuarial management reports "Actuarial Force Report on Capital Impulse" (3D ARCFI) of Form 5a allows seething real hidden potential for changing the force impulse of the profitability of the agrarian enterprise in the forecast period, even with the actual damage recorded in the public financial statements, e.g., IFRS.

The proposed 3D AFRCI Report is a component of actuarial management reporting. To our mind, it is the actuarial management reporting that needs to be regulated at the national level, i.e., at the level of National Accounting Provisions (Standards). Namely, a separate NAP (S) 3 "Actuarial financial reporting" needs practical implementation.

## CONCLUSION

Agricultural products account for the largest share (44.3%) in the structure of Ukraine's merchandise exports according to 2019 results. However, even with such a structure, according to official data of the State Statistical Service of Ukraine, compiled based on public financial statements of domestic agrarian enterprises, their activities became unprofitable for the first time in the last ten years. The absolute

sum of the adverse financial result of the operation was UAH 43.3 million. It is necessary to create favorable accounting and informational support in the form of financial statements at the macro level to attract the necessary amount of investment into the development of the Ukrainian agricultural sector. According to the study results, it is specified that: modern double-entry bookkeeping needs to be supplemented with a 3D format of an agricultural entity financial and economic activity reflection through the lens of the actuarial accounting paradigm (which was proposed to call “expect”); traditional financial statements are mostly prepared according to the accounting model, based on the concept of maintaining nominal financial capital. However other n-dimensional models and concepts may turn out to be more appropriate to provide information useful for economic decision making in investments; financial reporting in 3D aims to provide financial information on the reporting entity, which is useful for current and potential investors, lenders and other creditors in making decisions about providing resources to this entity; developed actuarial management report on the force impulse of capital (3D AFRCI), Form 5a estimates the real force potential of Ukrainian agrarian enterprises, which helps increase the efficiency of their economic activity and investment attractiveness; 3D management model of the profit force impulse of an agrarian enterprise presupposes the usage of an alternative method of “net profit” transfer pricing according to the accounting and informational content of the proposed 3D AFRCI Report; the introduction of an effective system for profit impulse management (PIM) in agriculture will contribute to a real assessment of the return on capital force impulses for profitable and unprofitable agrarian enterprises.

## AUTHOR CONTRIBUTIONS

Conceptualization: Yulia Manachynska, Olena Androsenko.  
 Data curation: Olena Fomina, Olena Moshkovska.  
 Formal analysis: Olena Fomina, Olena Moshkovska.  
 Funding acquisition: Olena Androsenko.  
 Investigation: Yulia Manachynska, Olena Androsenko.  
 Methodology: Svitlana Luchyk, Yulia Manachynska.  
 Project administration: Svitlana Luchyk.  
 Resources: Olena Fomina, Olena Moshkovska.  
 Software: Olena Fomina.  
 Supervision: Olena Fomina, Olena Androsenko.  
 Validation: Olena Moshkovska, Olena Androsenko.  
 Visualization: Olena Moshkovska, Svitlana Luchyk, Yulia Manachynska.  
 Writing – original draft: Svitlana Luchyk, Yulia Manachynska.  
 Writing – review & editing: Svitlana Luchyk.

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