Innovative Inclusion of Brand Management of Food Enterprises in the Conditions of World Price Volatility

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The article substantiates the determinants of innovative inclusion of brand management of food enterprises on the basis of a benchmarking approach, which allows managing the capitalization of entities, assessing the sensitivity of brand capital to the volatility of domestic and global market prices. The method of comprehensive evaluation is presented and the classifier of the integral of objects of the internal and external environment of effective use of brand capital of food enterprises is developed. It has been proven that the economic effect of innovative activities of food enterprises is the main internal source of growth in their market value, provided that the negative market factors of the external environment are leveled. The model of the integration of brand capital into the general capitalization management system of the food enterprises is given. The rate of growth of capital investment in innovation is analyzed and the structure of financing inclusiveness of brand capital (intangible assets) of food enterprises of the Ukraine is determined. The global supply balance of the main groups of products to exporting countries and the level of volatility of world prices according to the FAO's food index are presented. Calculated correlation dependence of profit on interest futures spot contracts (USDC) of food enterprises on a set of variable indicators. The forecast value of capitalization (market value) of food enterprises of the Ukraine was determined due to the annual increase in the value of brand capital.

1. Introduction

The modern global food market is characterized by dynamic trends that affect food safety, the stability of economic systems, and therefore, the prospects for innovative inclusion of food enterprises. Increasing competition for natural resources continues to contribute to their degradation and scarcity, with a negative impact on the means of production of the food sector and its

security. Under these conditions, it poses a challenge to world society – to find ways to integrate national policy into international policy, to implement global innovation processes and expand the inclusiveness of food enterprises at different levels of branding quality.

The main mission of branding is to satisfy the growing and changing demand for food, to stop the crisis in the competitive environment, to implement an

innovative strategy, to direct the economic system of food enterprises to increase productivity and sustainable use of resources that fall under the extensive and effectively functioning infrastructure of the innovation market (Aghazadeh, Beheshti Jazan Abadi, & Zandi, 2022). At the same time, brand management as an inclusion of competitiveness, investment attractiveness and leadership in the world market sets the pace of innovation implementation and has an extensive set of variables in managing the directions of innovation processes. National innovative technologies of food enterprises have significant export potential and make a significant contribution to ensuring safety on the world food market.

With such a trend, in recent years in most countries of the world, the indicator of the coverage of exports over imports has increased significantly, which has a positive effect on the level of profitability of food enterprises and the economic stability of countries (Enthoven & Van den Broeck, 2021). This is especially important for countries with weakened economies. They are characterized by a low level of income of the population, expenses for the grocery basket exceed 50% of the household budget, the dynamics of macro indicators does not contribute to the actual increase in the average daily consumption of products (Prokopenko et al., 2023). All the listed reasons lead to an imbalance of the food basket, which is lower than the basic norms, in particular, the majority of consumption of dairy products is less than the norm by 47%, fish products by 40%, meat products by 33%. Therefore, the emphasis of brand management is placed on countries with a weakened economic system, in which crisis trends in food encourage the creation of a foundation for innovative inclusion at the expense of certain determinants of brand capital management of enterprises in the conditions of a highly competitive environment in the raw and processing segments of the market (Timpanaro, 2023).

The formation of the branding policy of enterprises with a long-term perspective of innovative inclusion in the food sector has a popularizing strategic orientation, since the effectiveness of branding depends on the quality processes of managing intangible assets and creating the value of brand capital, not only through quantitative, but also qualitative measures (Trusova et al., 2022). At the same time, the turbulence and high level of uncertainty of the functioning of food enterprises in the conditions of crisis and volatility of world prices inhibits the nature of innovative inclusion of brand management.

The constant adjustment of the management system of capital management and the implementation of cost monitoring is accompanied by risks, the development of innovative infrastructure in the food sector, taking into account the dynamics of changing factors and imperatives of the global competitive environment, forces countries to constantly be in a state of dynamic changes (Suslikov, 2023). The creation of favorable conditions for the development of inclusive measures for the generation of innovations at enterprises through the implementation of branding strategies for economic growth allows to increase the quality of products in the face of constant volatility of world prices. That is why the priority of our research is the substantiation of the determinants of innovative inclusion of brand management of food enterprises on the basis of a benchmarking approach, which allows managing the capitalization of entities while assessing the sensitivity of brand capital to the volatility of world prices on the market. This direction is the driving force of the new inclusion of food enterprises to determine their strategic future within the framework of an effective branding policy.
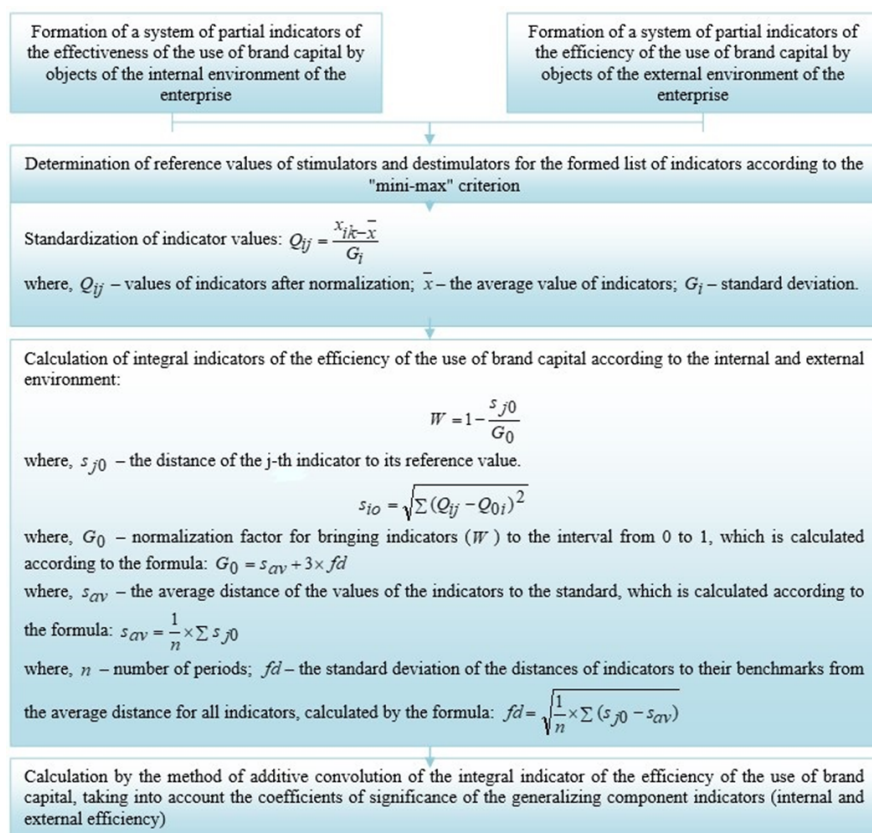
2. Materials and Methods

Since the management of brand capital is a determinant of marketing policy, branding at the enterprise should coordinate the overall marketing strategy, which includes the brand concept (Aghazadeh et al., 2022; Jiang & Sun, 2020). Differentiation of products (goods) occurs as a result of the creation of a brand concept, a unique set of attributes (both tangible and intangible), which make up the value proposition, taking into account the distinctive features and positioning of products (goods) (Bashir & Verma, 2019; Bocken & Geradts, 2020). However, it is worth noting that it is advisable to include not only the product in the brand capital management system, but also the company itself, since the brand is an attribute of the business entity in general, and not only of the products (goods) it produces. Mazur & Mukhina (2020) describe the brand equity management system as the identity criteria of products with a unique set of brand associations that brand developers try to create and constantly maintain and that emphasize the meaning of the brand for consumers. Brand identity helps to establish a relationship between the brand and consumers, creating a value proposition for them that includes functional, emotional benefits, self-expression benefits, and consumer trust.

The components of brand capital management systems, taking into account the proposals by Bagatska (2015) and Trusova et al. (2022), are differentiated into basic

and extended product (product) identity. Identity is necessary to establish the value proposition of the brand and allows you to determine its goals and purpose in the food market, to form a strategic inclusion of its capitalization based on the total volume of intangible assets that generate additional cash flows, contribute to increasing profits by setting higher (premium) prices for products (Timpanaro, 2023). According to this point of view, Melnyk (2019) and Lesyk et al. (2021) defined a logical sequence of the formation of brand equity value: from brand assets through strength to brand value, taking into account time aspects.

The method of comprehensive evaluation of the effectiveness of the use of brand capital is shown in Figure 1. At the first stage of effective use of brand capital, it is necessary to calculate partial indicators and their relationship between the objects of the internal and external environment of the enterprise (Malik et al., 2021). At the second stage, a taxonomic method of evaluating the integral indicator between partial indicators of the internal and external environment of the use of brand capital is chosen. Partial indicators are calculated as the ratio between the achieved and the normative (reference) level of external and internal efficiency of the use of brand capital, taking into account the weight of deterministic sets determined with the help of expert assessments. With the help of this method, a generalized characterization of the achieved level of internal and external efficiency of the use of brand capital in space relative to the reference level is carried out (Bocken & Geradts, 2020). When forming the standard, the "mini-max" criterion is used (the maximum value of the indicator is chosen as the standard – the indicator-stimulator, or its minimum value – the indicator-destimulator), which is ensured by a certain level of profitability (loss) (Lesyk et al., 2021).

Formation of a system of partial indicators of the effectiveness of the use of brand capital by objects of the internal environment of the enterprise

Formation of a system of partial indicators of the efficiency of the use of brand capital by objects of the external environment of the enterprise

Determination of reference values of stimulators and destimulators for the formed list of indicators according to the "mini-max" criterion

Standardization of indicator values: $Q_{ij} = \frac{x_{ik} - \bar{x}}{G_i}$

where, Q_{ij} – values of indicators after normalization; $\bar{x}$ – the average value of indicators; G_i – standard deviation.

Calculation of integral indicators of the efficiency of the use of brand capital according to the internal and external environment:

$$W = 1 - \frac{s_{j0}}{G_0}$$

where, s_{j0} – the distance of the j-th indicator to its reference value.

$$s_{io} = \sqrt{\sum (Q_{ij} - Q_{0i})^2}$$

where, G_0 – normalization factor for bringing indicators (W) to the interval from 0 to 1, which is calculated according to the formula: $G_0 = s_{av} + 3 \times fd$

where, s_{av} – the average distance of the values of the indicators to the standard, which is calculated according to the formula: $s_{av} = \frac{1}{n} \times \sum s_{j0}$

where, n – number of periods; fd – the standard deviation of the distances of indicators to their benchmarks from the average distance for all indicators, calculated by the formula: $fd = \sqrt{\frac{1}{n} \times \sum (s_{j0} - s_{av})}$

Calculation by the method of additive convolution of the integral indicator of the efficiency of the use of brand capital, taking into account the coefficients of significance of the generalizing component indicators (internal and external efficiency)

Figure 1: The Method of Calculating the Integral Indicator of the Efficiency of the Use of Brand Capital of a Food Enterprise.

Source: developed by the authors based on data (Kostyrko & Valenteychyk, 2017; Moiseev & Dombrovska, 2020; Prokopenko et al., 2023)

At the third stage of evaluating the effectiveness of the use of brand capital, a fuzzy-multiple model of the influence of the amount of intangible assets on the variable volume of product exports at the volatility of world prices is used. The values of integral indicators of the internal and external environment of effective use of brand capital are in the range [0; 1]. In this interval, a standard fuzzy classification of the levels of these integral indicators is determined. Their measurement interval can be considered as a set of indicator levels, since the calibration interval establishes

a standard fuzzy set. If there are extreme values that demonstrate the output of integral indicators beyond the interval [0; 1], then it is appropriate to recognize such ratios separately both for cases [±0] and for cases [±1].

A linguistic variable with time-plural features is introduced: "very low," "low," "medium," "high," "very high" as a system of five corresponding trapezoidal functions (Table 1).

Table 1: Classifier of the Integral of Objects of the Internal and External Environment of Effective Use of Brand Capital of Food Enterprises.

Interval of Values	Linguistic Variable	Degree of Estimation Confidence (membership function)
$0 \leq I \leq 0.15$	Very low (VL)	1
$0.15 \leq I \leq 0.25$	Very low (VL)	$\mu_1 = 10 \times (0.25-I)$
	Low (L)	$1 - \mu_1 = \mu_2$
$0.25 \leq I \leq 0.35$	Low (L)	1
$0.35 \leq I \leq 0.45$	Low (L)	$\mu_2 = 10 \times (0.45-I)$
	Medium (M)	$1 - \mu_2 = \mu_3$
$0.45 \leq I \leq 0.55$	Medium (M)	1
$0.55 \leq I \leq 0.65$	Medium (M)	$\mu_3 = 10 \times (0.65-I)$
	High (H)	$1 - \mu_3 = \mu_4$
$0.65 \leq I \leq 0.75$	High (H)	1
$0.75 \leq I \leq 0.85$	High (H)	$\mu_4 = 10 \times (0.85-I)$
	Very High (VH)	$1 - \mu_4 = \mu_5$
$0.85 \leq I \leq 1.0$	Very High (VH)	1
Source: calculated by the authors		

The authors offer the following sequence of stages of integration of brand capital (intangible assets) into the general capitalization management system of a food business: conducting marketing research; correction of a creative idea; implementation of the branding innovation program (creation of brand image and value, development of the concept of brand positioning on the market, patenting of the trademark and its advertising); evaluation of the effectiveness of brand use, integration of brand capital into the capitalization management structure of the enterprise (Figure 2).
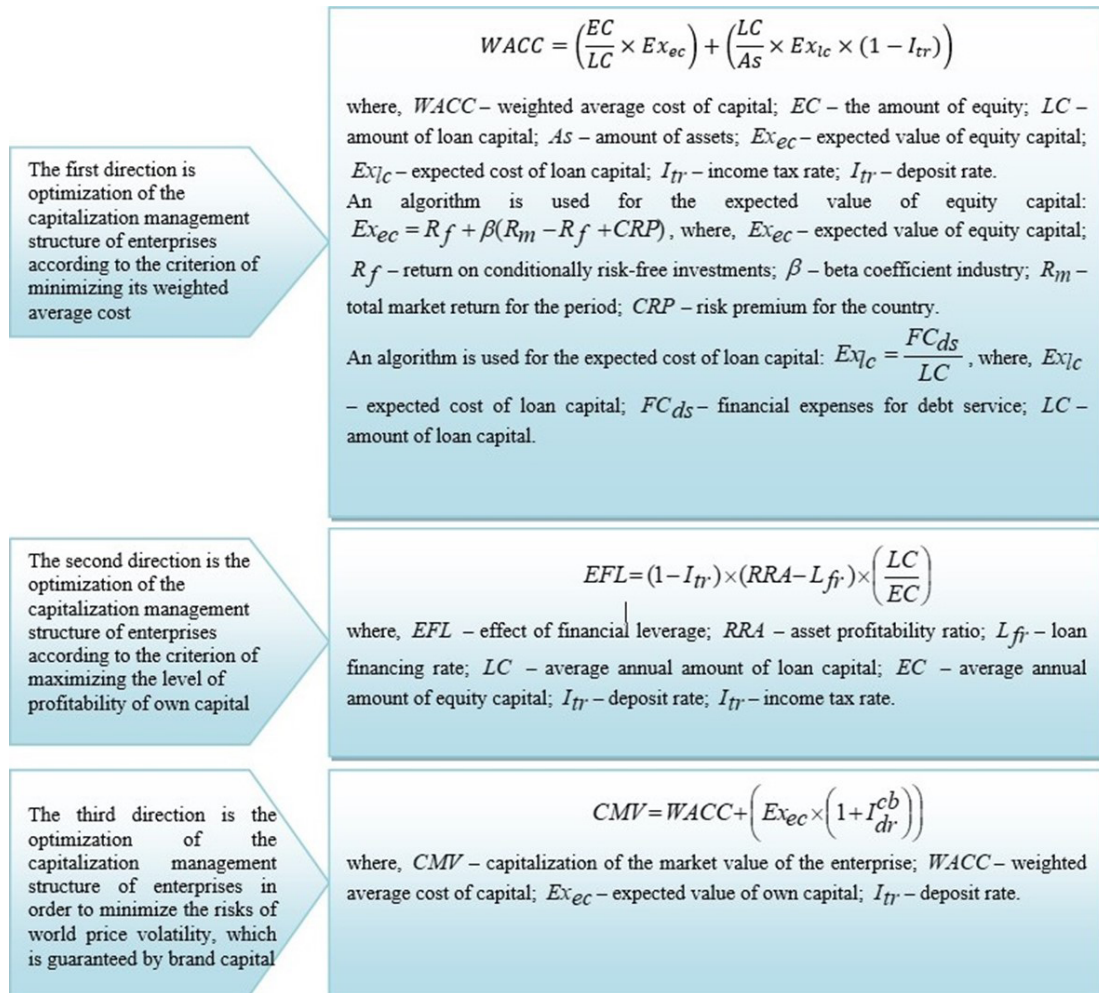
Integration of brand capital into the capitalization management structure of the enterprise, depending on its competitive advantages on the stock market and investment attractiveness on the financial market, which are sources of minimizing the risks of price volatility. Scientists Al-Afeef (2020), Yarovenko et al. (2021), and Kruvovyzyuk & Burban (2023) consider the integration of brand capital into the general capitalization management system of a food enterprise areas as a process of ensuring branding with own and borrowed resources, which establish the most effective proportionality between profitability and financial stability of the entity on the market. Optimization of the market capitalization of the enterprise combines two components: direct determination of the value of the enterprise and optimization of the market capitalization.
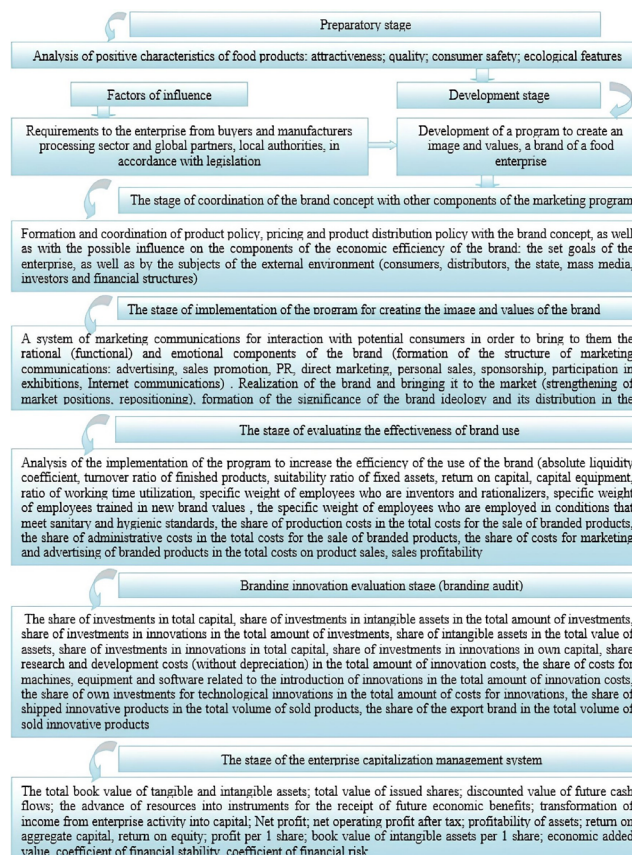
Figure 2: A model of Brand Capital Integration into the General Capitalization Management System of a Food Industry Enterprise
Source: developed by the authors based on the data (Khumarova & Laiko, 2020; Rytkönen et al., 2024; Trusova et al., 2020; Zhang et al., 2021)

Methodical approach to optimization of capitalization management of food enterprises is based on three main directions (Figure 3).

The first direction is optimization of the capitalization management structure of enterprises according to the criterion of minimizing its weighted average cost

$$WACC = \left(\frac{EC}{LC} \times Ex_{ec}\right) + \left(\frac{LC}{As} \times Ex_{lc} \times (1 - I_{tr})\right)$$

where, $WACC$ – weighted average cost of capital; EC – the amount of equity; LC – amount of loan capital; As – amount of assets; Ex_{ec} – expected value of equity capital; Ex_{lc} – expected cost of loan capital; I_{tr} – income tax rate; I_{tr} – deposit rate.

An algorithm is used for the expected value of equity capital: $Ex_{ec} = R_f + \beta(R_m - R_f + CRP)$, where, Ex_{ec} – expected value of equity capital; R_f – return on conditionally risk-free investments; β – beta coefficient industry; R_m – total market return for the period; CRP – risk premium for the country.

An algorithm is used for the expected cost of loan capital: $Ex_{lc} = \frac{FC_{ds}}{LC}$, where, Ex_{lc} – expected cost of loan capital; FC_{ds} – financial expenses for debt service; LC – amount of loan capital.

The second direction is the optimization of the capitalization management structure of enterprises according to the criterion of maximizing the level of profitability of own capital

$$EFL = (1 - I_{tr}) \times (RRA - L_{fr}) \times \left(\frac{LC}{EC}\right)$$

where, EFL – effect of financial leverage; RRA – asset profitability ratio; L_{fr} – loan financing rate; LC – average annual amount of loan capital; EC – average annual amount of equity capital; I_{tr} – deposit rate; I_{tr} – income tax rate.

The third direction is the optimization of the capitalization management structure of enterprises in order to minimize the risks of world price volatility, which is guaranteed by brand capital

$$CMV = WACC + \left(Ex_{ec} \times \left(1 + I_{dr}^{cb}\right)\right)$$

where, CMV – capitalization of the market value of the enterprise; $WACC$ – weighted average cost of capital; Ex_{ec} – expected value of own capital; I_{tr} – deposit rate.

Figure 3: Methodical Approach to Optimization of Capitalization Management of Food Enterprises.
Source: developed by the authors based on the data (Al-Afeef, 2020; Kruvovyzyuk & Burban, 2023; Yarovenko et al., 2021)

Within this component, it is expedient to evaluate the effectiveness of this process from the standpoint of the positive dynamics of the enterprise value indicator, which is described by the following expression:

$$EV_1 - EV_0 \geq 0 \Rightarrow \Delta EV \geq 0, \quad (1)$$

where, EV_0 – previous value of the enterprise value;

EV_1 – the present value of the enterprise value after the implementation of the measures;

ΔEV – an increase in the value of the enterprise thanks to the implementation of the measures of the mechanism.

The general evaluation of the effectiveness of this process is determined by the increase in the target indicator of the market capitalization of the enterprise, which is described by the following expression (Kruvovyzyuk & Burban, 2023):

$$M_{cap1} - M_{cap0} \geq 0 \Rightarrow \Delta M_{cap} \geq 0, \quad (2)$$

where, M_{cap0} – preliminary value of the enterprise's market capitalization;

M_{cap1} – the existing value of the enterprise's market capitalization after the implementation of the measures;

ΔM_{cap} – increase in the market capitalization value of the enterprise thanks to the implementation of measures.

Therefore, in order to achieve the highest innovative inclusion of brand management and the efficiency of the use of brand capital through its integration into the capitalization system of a food enterprise, it is necessary to provide for the management of

the structure of sources of financing of intangible assets in the context of achieving a high level of profitability of own investments and ensuring the continuity of innovative activities. The management of the financial resources of a food enterprise has a significant impact on changes in its market value in the medium term. This direction is one of the main tasks of brand management, which reflects the efficiency of the entity's activity, its competitiveness, investment attractiveness and the ability to generate added value.

3. Results

The continuous transformational processes of innovative inclusion of food enterprises and the military invasion of the aggressor country on the territory of independent Ukraine partially destroyed their integral infrastructure of brand management. This led to a food crisis and provoked a reduction in the volume of exports for raw material and processing clusters (Alaverdyan & Romanenko, 2019). There is a shortage of means of production, a decrease in production entities, the destruction

of value-added product chains, a deepening of the loss of export-oriented food complexes, a partial loss of competitive positions on the domestic and foreign markets. In the wartime state, the innovative inclusion of food enterprises of the Ukraine is under the influence of negative trends in the external environment.

It should be noted that for 2017-2023, the GDP in Ukraine, with the exception of 2022, had a positive trend with annual growth rates ranging from 105-130%. The index of investments in fixed capital and in intangible assets of the food sector for 2017-2023 decreased (from 123% to 112.7%); a particular decline in the food sector was observed in 2022 (up to 65%), due to the military conflict, which provoked the economic downturn and a decrease in the activity of enterprises in investing branch marketing activities (MinFin, 2023a; Samoiliuk & Levchenko, 2023; State Statistics Service of Ukraine, 2023). At the same time, with the support of international organizations and financial institutions, the index of direct foreign investments for 2022-2023 increased by 3.7 times (Figure 4).
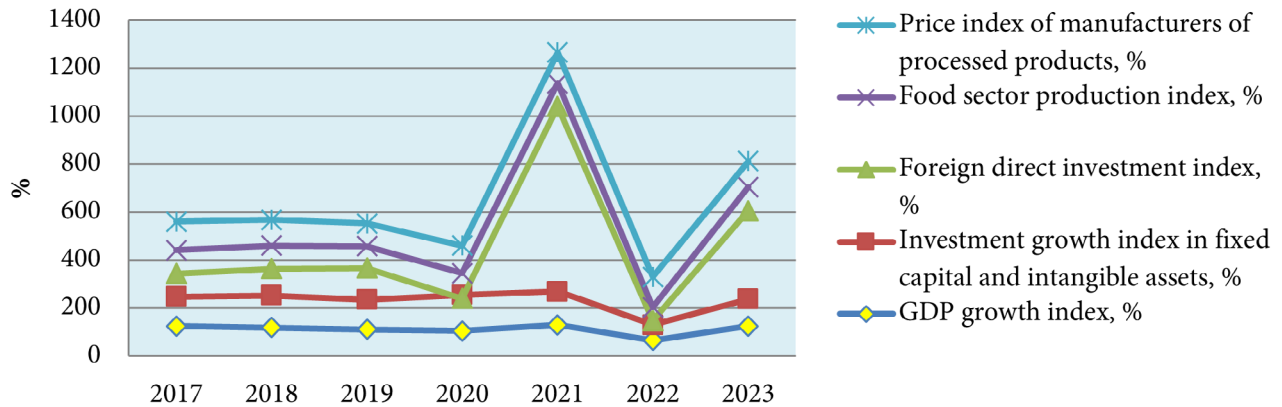
Figure 4: General economic indicators of the activity of food enterprises in Ukraine for 2017-2023.
Source: developed by the authors based on data (FAO, 2023; MinFin, 2023c, 2023d; National Bank of Ukraine, 2023)

The dynamics of the index of products of the food sector indicates a reduction in the volume of production of branded products in 2017-2019 (from 97.1% to 91.7%) as a result of the crisis phenomena in Ukraine and the partial occupation of the territories of the Donetsk and Luhansk regions by the aggressor country (MinFin, 2023b). This led to the instability and volatility of world prices in the period 2020-2022 and accelerated the increase in the price index of food industry producers (from 115.7% to 126.4%), which indicated a high need for subjects to maintain market

positions in conditions of a significant decrease in the purchasing power of the population and domestic demand for products (FAO, 2023). The dynamics and structure of capital investments in innovations of fixed capital and intangible assets (brand capital) of food enterprises show that their volume increased from 4.04 billion USD to 7.01 billion USD in 2017-2021. The rate of growth of investments in fixed capital innovations during the research period increased from 22.96% to 50.48%, in intangible assets (brand capital) – decreased from 41.66% to 39.38% (Figure 5).
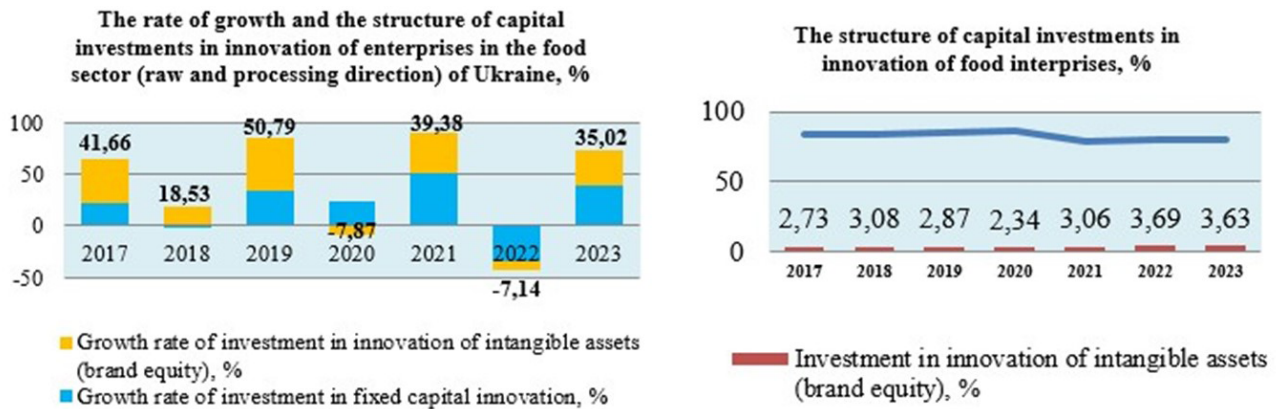
Figure 5: Growth Rate of Capital Investments in Innovations Of Food Enterprises of the Ukraine, %.
Source: developed by the authors based on the data (MinFin, 2023a; National Bank of Ukraine, 2023; Samoiliuk & Levchenko, 2023; State Statistics Service of Ukraine, 2023)

In 2022, the volume of investments in fixed capital innovations decreased by 34.88%, in intangible assets (brand capital) by 7.14%. The positive dynamics of investing funds to restore the innovative potential of food enterprises in 2023 indicates the gradual revival of their competitiveness and the expansion of export potential on the world market. Despite the difficult conditions of the restorative innovation process in the conditions of the military conflict, the share of food enterprises that continued new technological processes in 2022-2023 almost did not change (it was 4-5%). However, the share of enterprises that mastered the production of new types of products decreased significantly (3.8% in 2022 against 5.6% in 2021), which was reflected in the negative dynamics of the implementation of the mastered production of brand types of products, the number of which in 2022 in relation to by 2021, it decreased by almost 3.4 times, compared to 2017, it decreased by 4.0 times (Table 2).

Table 2: Implementation of Innovations in the Production of Food Enterprises of the Ukraine for 2017-2023.

Indicators	2017	2018	2019	2020	2021	2022	2023
Specific weight of food enterprises that introduced innovations, % of the total number	11.9	11.2	14.2	13	16.8	12.8	12.2
carried out complex mechanization and automation of production, %	3.3	5.1	8.7	7.6	7	4	7.9
implemented new technological processes, %	4.1	2.7	5	4.8	4.1	2.7	4.9
mastered the production of branded products, %	6.4	4.7	5.5	6.2	5.6	3.8	5.8
The specific weight of sold branded products in the volume of food exports, %	6.5	6.7	6.7	5.9	4.8	3.8	3.8
New technological processes and units have been implemented including low-waste, resource-saving ones	1445	1419	1647	1893	2510	710	1003
low-waste, resource-saving	690	424	634	680	753	230	517
The production of branded types has been mastered products, units	3152	2408	2526	2446	2685	788	3238
Source: developed by the authors based on the data (khoRytkönen et al., 2024; State Statistics Service of Ukraine, 2023; UANIPIO, 2023)							

Comparing the increase in the specific weight of intangible assets of food enterprises in Ukraine according to the model presented in Table 2, 15 leading enterprises and outsiders were identified that manage brand capital (intangible assets) and ensure its effective use (Figure 6)
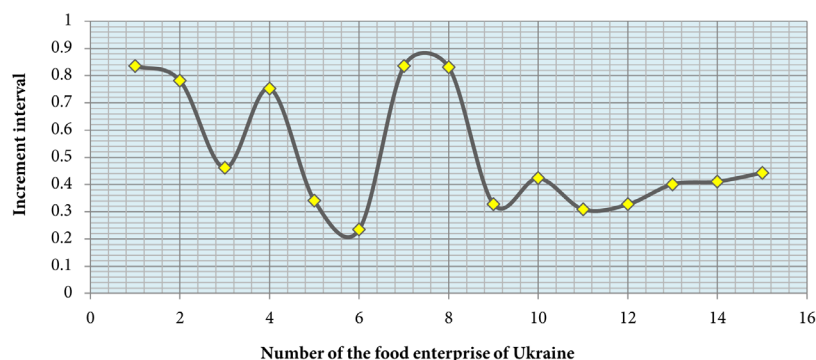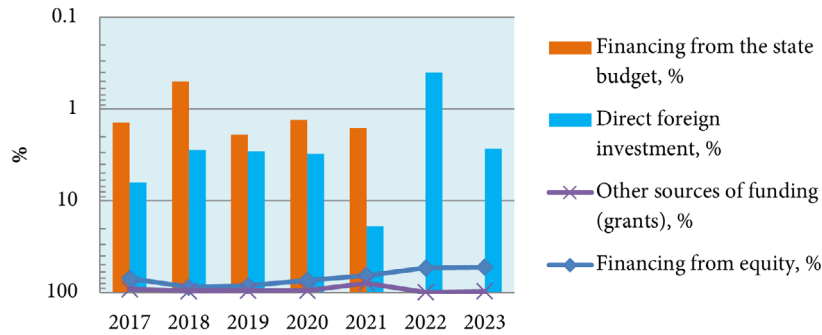

Figure 6: Integral of Brand Equity Growth (share of intangible assets) in the Assets of food Enterprises of the Ukraine.
Source: developed by the authors based on the data (State Statistics Service of Ukraine, 2023; UANIPIO, 2023)

Disruption of pre-war integrated clusters of the food sector, limitation of export capacities and reduction of the level of intensification of food production during the war in Ukraine led to negative changes in the world economy market and in global trade and economic relations between states. This is due to the suspension of the main export chains of the food sector, as well as the complication of certification of a separate group of goods that require a resource component in the innovation process. The main sources of financing the inclusiveness of brand capital (intangible assets) of food enterprises during 2017-2023 were own funds, although their share decreased from 70.2% in 2017 to 52.9% in 2023. However, the share of financing from other sources of financing increased (grants from international financial institutions) from 22.1% in 2017 to 44.4% in 2023 (Figure 7).

Figure 7: The Structure of Financing the Inclusiveness of Brand Capital (intangible assets) of Food Enterprises of the Ukraine, %.
Source: developed by the authors based on the data (National Bank of Ukraine, 2023; State Statistics Service of Ukraine, 2023; UANIPIO, 2023)

This means that international partners focus on financing innovative projects with a high content of added value. Financing and support of innovative activity by the state in 2017-2021 remained extremely low, the specific weight of the state budget in the structure of innovation financing was at the level of 0.5-1.6%, although it had a positive upward trend in the last three pre-war periods.

During the war period, Europe remains the market for elite raw materials of Ukrainian food enterprises. This segment is marked not only by a high level of capacity and financial stability for entities, it is a reference standard for the quality of goods, ensuring food security and achieving a high level of state competitiveness. In 2023, the foreign trade turnover of raw food products from Ukraine to the countries of the world decreased by 1.4% compared to 2022 and amounted to USD 98 billion. The deficit in trade in raw materials of the food sector is significant and amounts to 26.4 billion USD. Income from the export of Ukrainian raw materials (wheat) in 2023 decreased by 18.7% compared to 2022 and was equal to 35.8 billion USD (MinFin, 2023b; Samoiliuk & Levchenko, 2023).

World wheat export volumes in the 2023-2024 season in relation to the 2022-2023 season predict an increase in the volume of raw material production and an increase in its consumption with a slight reduction in final stocks (Figure 8).
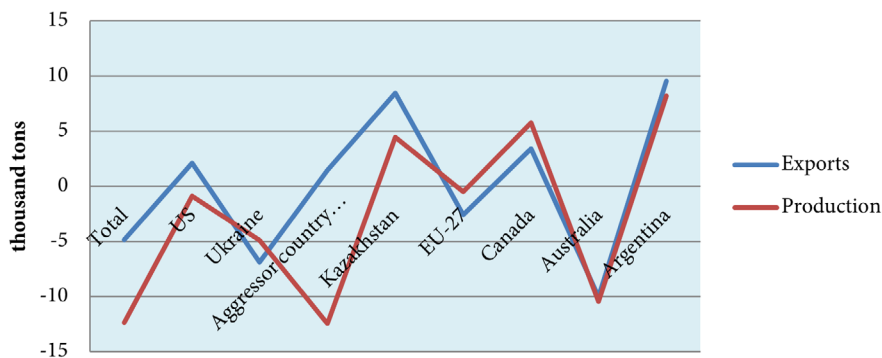

Figure 8: World Balance of Wheat Supply in Major Eight Exporting Countries (2023-2024 to 2022-2023), Thousand Tons
Source: developed by the authors based on the data (State Information and Analytical Center for Monitoring Foreign Goods Markets, 2022; UNCTAD, 2023)

It will be problematic to export Ukrainian corn to Europe in 2024. The only thing that can help Ukraine is the opening by China of its own market for Brazilian corn, since the general demand for corn from China is focused on Brazil. But Ukrainian corn has a competitive advantage, both on the Chinese market and in the world, because it does not have genetically modified impurities (Figure 9).
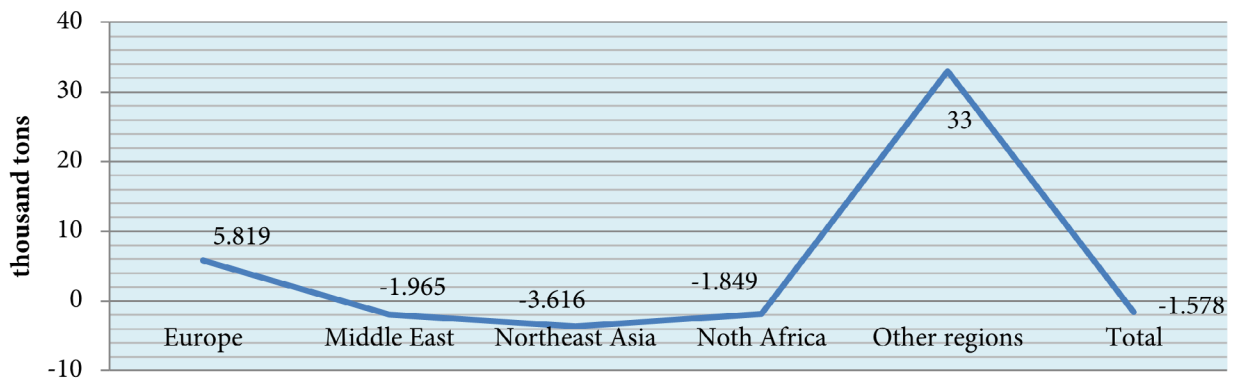

Figure 9: The Forecast Trend of a Decline in the Export of Ukrainian Corn on the World Market due to the State of war in the Country for 2023-2024

Source: developed by the authors based on the data (State Information and Analytical Center for Monitoring Foreign Goods Markets, 2022; UNCTAD, 2023)

Domestic prices in Ukraine are affected by the food price index (FAO's), which reflects the monthly movement of world prices in a basket of food products. It is formed on the basis of the average values of price indices for five product groups, adjusted taking into account the average share of each such group in the volume of exports in the period 2017-2023. In general, the volatility of world prices for the entire list of goods of food enterprises is presented in Figure 10.
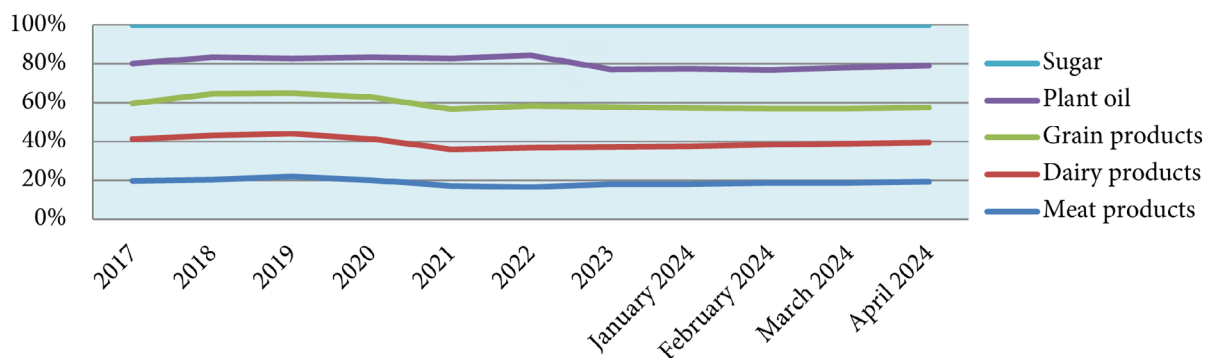
Figure 10: Volatility of world prices according to the FAO's food index in 2017-2023 and in January-April 2024, %

Source: developed by the authors based on the data (FAO, 2023; State Information and Analytical Center for Monitoring Foreign Goods Markets, 2022; UNCTAD, 2023)

World prices for food products in 2023 decreased by 10.7% compared to 2022. Note that vegetable oil prices increased by 3.4%. Due to high import demand from buyers from Northeast Asia for butter and skimmed milk powder, as well as increased demand in the domestic market of Western Europe, the dairy price index increased by 2.2%. In 2022-2023, the price index for sugar increased by 1.4%; in the IV quarter of 2023, it was 41.1% higher than in the same period of 2022. This happened under the influence of global exports and the increased concern of traders about the deterioration of its production prospects in the two leading exporting countries (Thailand and India), due to events, associated with "El Nino". The meat price index decreased by 0.4% (slight drop in world prices for poultry, pork and cattle meat, mostly due to a large export supply).

World grain stocks are expected to grow by 2.7% by the end of the 2024 season and reach a new record level. In 2023-2024, the global ratio of grain stocks to consumption is 30.8%, which indicates a general comfortable level of supply. At the same time, world grain trade in 2023-2024 decreased to 468.4 million tons, which is 1.8% below the level of 2022-2023. In general, world prices according to the index of food products in 2023 compared to 2022 decreased by 20 % (FAO, 2023; State Information and Analytical Center for Monitoring Foreign Goods Markets, 2022; UNCTAD, 2023). Thus, unsuccessful forecasting of world prices and unstable competitive environment have a critical impact on the situation for most countries of the world. This proves that often the reason for the high volatility of domestic food prices is imperfect state policy.

4. Discussion

According to Prokopenko et al. (2023), the negative consequences of the growth of food production during the crisis are manifested in the export-raw material orientation, in the structural imbalance and environmental unjustification of the activities of enterprises. In this regard, the concept of inclusive growth is extremely important, which consists in the fact that the increase in the efficiency of the use of production resources should be accompanied by overcoming all types of inequality in society. For food enterprises, this means an increase in the level of employment in the territories where large food companies are located (including at the expense of activities not related to food production).

Among the various price regulation mechanisms for the products of food enterprises, the following are distinguished: creation of buffer stocks, procurement for the purpose of price support; subsidizing exports; restrictions on food imports; compensation payments. Minimum threshold levels are established for market prices, below which they cannot fall, with the help of commodity credits and direct state purchase of products. For some specific goods (for example, the processing direction of the food sector), the average daily level of supply and consumption is maintained, and both wholesale and retail prices are subject to regulation. Such a state price support mechanism is restrictive and quite expensive. Along with these measures of state regulation, direct state subsidies are applied for land management, environmental protection measures, and the acquisition of certain

innovative means of production (Jiang & Sun, 2020; Mazur & Mukhina, 2020). The stimulating nature of state regulation - the program of compensation payments, flexible production contracts, insurance – helps to increase the income of food producers and protect them from unpredictable fluctuations in the market situation (Trusova et al., 2022).

When forming the demand for cheap food products, the Giffen effect is observed: with a general increase in food prices, the consumption of cheap products increases due to a sharp reduction in the demand for more expensive products (Jiang & Sun, 2020). On the other hand, under conditions of rising incomes or falling prices, there is no adequate increase in demand, since the level of food consumption is determined by two simultaneously acting factors – physiological and economic. At the same time, their actions do not coincide. The collision on the market of two inelastic arrays of demand and supply leads to disproportionately large price fluctuations. That is, an increase or decrease in the supply of food products to the market by 1% may be accompanied by a change in food prices by several percent. This makes prices on the food market very volatile. Thus, the price mechanism is not able to fully fulfill its main function – to be a regulator of supply and demand. As a result, the food market is not self-regulating, especially with modern mass production and sales of products equipped with brand attributes (UNCTAD, 2023).

The price effects of fundamental changes in demand and supply, as a rule, occur gradually, as certain price trends increase or decrease. When fundamental factors change gradually, market participants may not immediately change their behavior, but when changes in supply and demand reach a certain level, market participants may begin to behave differently. They may begin to be guided by feelings and emotions, rather than by analyzing fundamental factors. Irrational behavior caused by increased demand, supply and other global factors can create a tipping point in the movement of food prices and, as a result, make markets more volatile. Skewed relations between price jumps and long-term trends may indicate non-linear price dynamics (Jiang & Sun, 2020).

In Table 3 shows the size and probability of sudden price jumps under different price regimes for food products, which, in turn, are determined by the size of smoothed price levels (trends).

**Table 3:** Dependence of Domestic Prices for Food Products on the Volatility of World Prices.

Production	Price Level			
	Low[*]	Below Average	Above Average	High
Grain Products				
Variation coefficient, %	4.3	3.8	3.5	6.1
The probability of an extreme price jump in world prices	0.23	0.09	0.12	0.27
Vegetable Oil				
Variation coefficient, %	4.0	4.2	4.0	6.4
The probability of an extreme price jump in world prices[**]	0.14	0.18	0.13	0.30
Sugar				
Variation coefficient, %	4.2	3.1	4.0	5.8
The probability of an extreme price jump in world prices	0.21	0.07	0.19	0.28
Dairy Products				
Variation coefficient, %	4.7	3.4	4.1	7.0
The probability of an extreme price jump in world prices[**]	0.12	0.14	0.22	0.30
Meat Products				
Variation coefficient, %	5.1	3.2	5.4	6.7
The probability of an extreme price jump in world prices[**]	0.10	0.16	0.27	0.32

Note. * The price level corresponds to the quartile (25%) of the distribution of price values; ** Extreme price jump – when the price value exceeds 90% of all values of the general population.
Source: developed by the authors based on the data (Aghazadeh et al., 2022; Jiang & Sun, 2020; UNCTAD, 2023)

Trends in the world economy contribute to the spread of the phenomenon of financialization of food markets through futures contracts. According to the theory of value, increasing the volume of futures contracts for the purpose of making a profit contributes to the growth of the price above the average market level. A stimulating factor for the use of spot contracts for food enterprises is the use of interest futures to ensure additional value of intangible assets (brand equity) at the expense of the market of bank deposit rates, for a period of up to one year to minimize the impact of the risks of world price volatility (Sweet, 2014). In this case, it is necessary to use interest rate futures, which are a real tool for minimizing the risk of world price volatility (Dawn, 2022). Before their appearance, there was no effective term market of interest financial instruments (in contrast to the term foreign exchange market), and therefore, the risks of interest rate changes could not be distributed (transferred) to other market participants, i.e. minimized and insured (Goswami, Adjemian, & Karali, 2022).

Futures contracts are tools not only of stock markets, but also of the financial market and have proven themselves well in the benchmark marketing policy of food industry enterprises to minimize risks through the bank deposit system and the market of long-term bonds (LTDs) with a fixed coupon income (Figure 11).
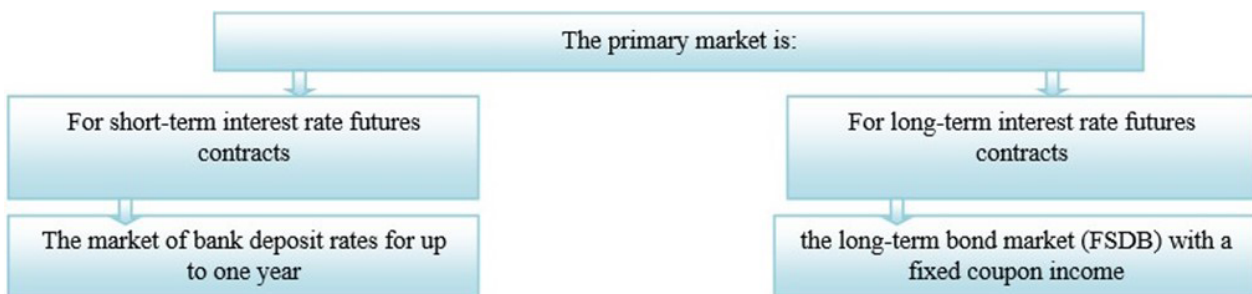
Figure 11: Use of Futures Contracts by Food Enterprises in the Financial Market.
Source: developed by the authors

Using the multiple regression model of interest futures under spot contracts at five large enterprises of Ukraine ("FIE №1", "FIE №2", "FIE №4", "FIE №7", "FIE №8") from the general sample of studied subjects of the food sector in order to minimize the risks of volatility of world prices for food products, - as a dependence of the variable and selected independent indicators (total assets of food enterprises, return on capital, return on assets, profit on one percent futures (USDC), the book value of intangible assets, deposit-leverage, the ratio of income from interest futures to profit, the ratio of income from interest futures to the book value of intangible assets, profit per one bonds (FSDB) allowed us to assume a working hypothesis regarding the integration of brand capital (intangible assets) in the process of managing the capitalization of the market value of the studied

market entities. In the considered model, the value of intangible assets, profitability, profit on one percent futures (USDC), book value of intangible assets, the ratio of income from interest futures to the book value of intangible assets, and leverage are considered statistically significant predictors of minimizing the risk of global volatility prices and their movement by the main groups of food products in the studied enterprises.

Considering the issue of the influence of macroeconomic factors on the capitalization of the market value of the studied food enterprises through the financial market, as well as the stock market of individual countries of the world, we have systematized a list of macroeconomic indicators according to the data of the National Bank of Ukraine (2023). Emphasis is placed on the innovative inclusion of subjects, their investment attractiveness and competitiveness: consumer price index, food producer price index, GDP, food production index, food production index, unemployment index, real wage index, exchange rate, world prices for oil, the interest rate on government bonds (FSDB), the price

of 1 hectare of land (Avdalovic & Milenković, 2017).

Taking into account the innovative inclusiveness of the researched food enterprises and the crisis phenomena in the country's economy, it is proposed to forecast the profit based on interest rate futures spot contracts (USDC) of the researched enterprises, subject to the use of multiple regression of the following independent variables: interest rate futures growth index (USDC); profit for one FSDB; the country's GDP growth index; the price of one hectare of land. The general regression equation for calculating the market value of the studied agro-industrial companies, taking into account macroeconomic factors, looks like this:

$$CMV_{FIE} = 39.974 + 97.342 \times I_{GDP} + +17 \times G_{pr} + 14.0 \times P_{pf(USDC)} + 18.2 \times P_{FSLB} + ui \quad (3)$$

The systematized influence of each of the factors and the distribution of their power on the level of capitalization of the studied food enterprises is shown in Figures 12 and 13.
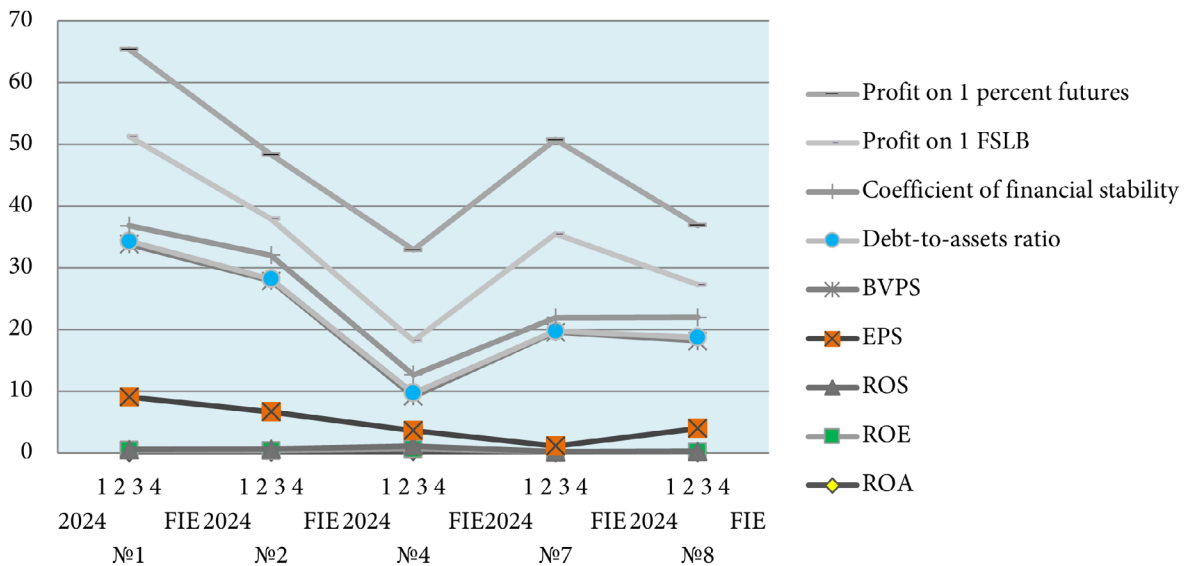

Figure 12: A set of Variable Indicators and Their Influence on the Interest Rate Futures of Enterprises in the Food Sector of Ukraine for 2024

Source: calculated by the authors

According to the results of the correlation analysis, it was established that the indicators of profitability by fashion have a significant direct impact on the profit on interest futures of spot contracts (USDC); profit per OVDZ – moderate-weak impact; indicators of the state of financial stability – multidirectional and moderate influence; the added value of brand equity is a direct and moderately significant influence.

Thus, among the five presented enterprises of the food sector of Ukraine, which position branded products on the world market and which are able to increase the level of their own capitalization, are FIE #1, FIE #2, FIE #7. They specialize in the export of raw and processed products and have a strong investment capacity to increase innovation potential and compete with global players, even in the face of global price volatility.
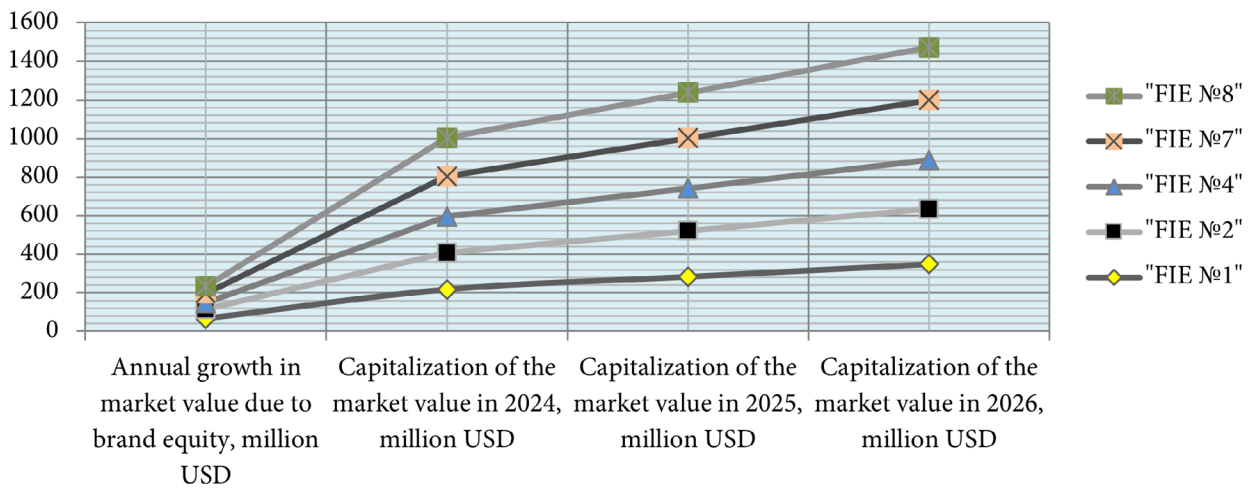
Figure 13: Forecast of the Capitalization (market value) of the Enterprises of the Food Sector of Ukraine due
to the Annual Increase in the Value of Brand Capital for 2024-2026

Source: calculated by the authors

5. Conclusions

Innovative inclusion of branding management is embodied in the competitiveness and investment attractiveness of food enterprises, as a result not only of the ability to effectively use the brand's capital, but also as the effective ability of entities to respond in a timely manner to the constant change in consumer needs, the ability to timely develop the necessary measures in response on competitors' innovations and neutralize adverse price fluctuations in the domestic market due to the influence of world prices. At the same time, the innovative inclusion of branding management of food enterprises changes their systematic approach to preserving or strengthening already acquired and creating competitive advantages in the future. In this sense, the multidimensional concept of innovative inclusion shifts the focus of branding management from the environment of national interests of the state to the enterprises of the food sector of those countries that are positioned in the global space as leaders of brand capital with a certain strategic thinking, as leaders of the business environment, with favorable conditions for promotion innovations in any country of the world economy.

Food markets are characterized by an extremely high degree of price volatility compared to other markets. There are three main reasons for this. First, the volume of production fluctuates from year to year due to seasonal factors. Second, the price elasticity of supply and demand is relatively low. When the volume of products on the market changes, prices fluctuate, trying to establish an equilibrium level.

Thirdly, the manufacturer cannot quickly react to a change in price, since the production cycle in many branches of the food industry is long. The reaction of market participants only increases uncertainty and increases volatility.

Therefore, building up "long" positions on the stock market through the purchase and sale of futures contracts will allow to increase the expected price on the food market. In addition, interest rate futures are almost the only contractual obligation for the purchase and sale of an interest rate instrument with the definition of terms and interest rates in the contract at an agreed rate (rate) for a certain future date, in order to minimize the volatility of world prices. That is, futures contracts reduce risks, they guarantee that the seller will sell the product, and the buyer will receive it; futures can be resold. If one party changes its mind to comply with the terms of the agreement, it has the opportunity to resell its right to a third party; it is a good trading tool for profit. This is used by investors who want to diversify their asset portfolio; interest fees are lower than in stock transactions, giving more net income and high liquidity. Assets can easily be resold at a good rate if needed.

5.1. Availability of Data and Materials

Data will be available on request.

6. Funding

6.2. Disclosure of potential Conflicts of Interest

The authors declare they have no conflict of interest.

6.3. Ethical Approval

This article does not contain any studies with human participants or animals performed by any of the authors

6.4. Informed Consent

Not Applicable

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