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CALCULATION OF THE PROFITABILITY FACTOR OF THE JOINT PROJECT WITH A CHINESE UNIVERSITY

РАСЧЁТ КОЭФФИЦИЕНТА РЕНТАБЕЛЬНОСТИ СОВМЕСТНОГО ПРОЕКТА С КИТАЙСКИМ УНИВЕРСИТЕТОМ

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Abstract. One of the survival conditions of Ukrainian university becomes a struggle for foreign entrants in a competitive environment on the international market and the loss of Ukrainian entrants. Special attention should be paid to students from the People's Republic of China. The implementation of joint educational projects with Chinese partners is promising. The innovative methodology of calculating of the profitability factor of the joint educational project with a foreign university developed for a preliminary assessment of the success of such projects. This methodology was applied to assess the possibility of establishing a joint program with the University in Zhenjiang City, Jiangsu Province.

Keywords: international educational program, calculation methodology, profitability factor

Аннотация. Из-за снижения количества украинских абитуриентов, одним из условий выживания отечественного университета становится борьба за иностранных студентов в конкурентной среде на международном рынке. Особое внимание в этом процессе уделяется Китайской Народной Республике. Реализация совместных образовательных проектов с китайскими партнерами открывает большие перспективы. Для предварительной оценки успешности подобных проектов разработана инновационная методология расчета коэффициента доходности образовательного проекта совместно с иностранным университетом. Эта методология была применена для оценки возможностей реализации совместной программы с университетом г. Чжэньцзян, (провинция Цзянсу, КНР).

Ключевые слова: международная образовательная программа, методология расчета, коэффициент доходности

Анотація. В умовах зменшення кількості українських абітурієнтів однією з умов виживання університету стає боротьба за іноземних учасників у конкурентному середовищі на міжнародному освітньому ринку. Особлива увага у цьому процесі приділяється студентам з Кітайської Народної Республіки. Реалізація спільних навчальних проектів з китайськими партнерами є перспективною. Для попередньої оцінки успіху подібних проектів розроблено інноваційну методику розрахунку коефіцієнта рентабельності освітнього проекту разом з іноземним університетом. Ця методологія була застосована для оцінки можливості створення спільної програми з університетом міста Чженьцзян (провінція Цзянсу, КНР)..

Ключові слова: міжнародна навчальна програма, методика розрахунку, коефіцієнт прибутковості

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PROBLEM STATMENT

The modern market of educational services on the territory of Ukraine is a complex model of the European model, built on the basis of the Soviet school, which had high indicators in the field of exact and medical sciences. Integration of the powerful post-Soviet educational cluster of Ukraine in the format of the Bologna process is still to this day. The adoption of the «On Higher Education from 01.07.2014 No. 1556-VII» Law [1] by the Verkhovna Rada was the impetus for accelerating its actual implementation.

Ukrainian higher education institutions should pay attention to its players during entering the world educational services market. For example, consider the nearest universities of the European Union. Despite the progress made in integrating sustainability issues into curricula and the management of higher education institutions around the world, progress in Central European countries has been mixed for countries such as the Czech Republic, Hungary, Poland, Serbia, Slovakia and Slovenia. A review and a critical reflection of the current situation in these countries provided an understanding of both common features and differences at the national level and general trends in the region. Critical transition factors show a temporal hierarchy that represents the various stages of the transition from environmental awareness to an understanding of the «education for sustainable development» ambiguous term and a more pragmatic approach where education is closely related to green campus initiatives. These countries basically reached the lower stages of transition than in the rest of the European Union. There are largely no constructivist, transdisciplinary approaches in the region that underlie the focus on competence as a practical prerequisite for democratic learning, which is focused on sustainability [2].

But despite some degree of criticism from Western European universities, the higher educational structures of these countries are direct competitors for Ukrainian higher educational institutions. Central European universities successfully enroll tens of thousands of Ukrainian students every year, offering scholarships, preferential terms for payment for educational services and the absence of the need of a successful certificate of passing a general independent evaluation. Almost half of them go to Poland, where in 2014 more than 23,000 Ukrainian students have been studying [3].

One of the conditions for survival of the Ukrainian university is the struggle for foreign entrants in such a tough competitive struggle in the international market and the loss of Ukrainian students. Special attention should be paid to applicants from the People's Republic of China. China took the first place in the world in terms of the number of citizens sent annually to study abroad according to the «Report on the "Chinese students studying abroad development" [4]. According to UNESCO statistics, the number of Chinese students abroad is 14% of the world's total, turning China into the largest provider of foreign students.

LITERATURE REVIEW

It is noted that higher education institutions all over the world are increasingly focusing on acquiring a wider range of skills and knowledge within the curriculum, which should increase their chances of academic success, especially in the labor market. That, in turn, makes competitive a higher

educational institution that produces more successful specialists. This approach is a key for many universities, but at the same time, not every educational institution uses integrative approaches that can become the key to the successful implementation of the modern curriculum. «Project training» is one of the solutions to this approach. Project-oriented training can be more widely used in support of integrative approaches to the sustainability of educational projects [5]. Using the integrated design educational programs in higher education can raise the graduate's level, as capable of solving complex specialist problems. In particular, this approach can be applied in the implementation of joint educational programs between two or more educational institutions.

There is a tendency to create a new European area of higher education. It implies both new models of teaching and evaluating students and professors by reassessing their pedagogical practice [6]. The orthodox approaches of teaching are inferior to modern methods of articulating theoretical bases with practical components.

The economic analysis, focused mainly on the assessment of overall investment costs, is widely used in the West for the initial evaluation of joint projects. This is the key goal of conceptual design. Cost estimate detail degree depends on the type of projects. This can be ±30% for the preliminary design. If you take into account the complexity of performing the calibration for some members of the operation and finding suitable costing data, then the error is even greater for student projects. The identification of profitability concepts such as return on investment, payback period and discounted cash flow is the main objective. Temporary money variation, namely the credit interest rate and inflation affects on the profitability factor. The introduction of new products with higher added value creates opportunities for obtaining more profitable profits in an uncertain economic environment [7].

Unlike the western approach, the key factor in the preparation of the project is the receipt of profit (or even super profits). The concept proposed by the authors focuses on self-sufficiency.

THE AIM OF THE WORK is to develop an innovative methodology for calculating the profitability factor of a joint educational project with a foreign university.

BASIC MATERIAL

The methodology for calculating the profitability factor of a joint educational project with a foreign university.

In general, the number of students enrolled at the university, taking into account dropouts by year:

Δn_1 — on the first course of the first year of study;

Δn_2 — from accepted for the first course of the second year of study;

etc.

The total number of students from the first enrollment in the university will study to the end of the university

$$n_t = 4n_1 - 3\Delta n_1 - 2\Delta n_2 - \Delta n_3$$

where $4n_1$ — the maximum possible number of students for a 4-year learning cycle.

n_1 — students recruitment for the first course,

$\Delta n_1, \Delta n_2, \Delta n_3$ — losses after 1, 2, 3 courses.

$n_2 = n_1 - \Delta n_1$

$n_3 = n_1 - \Delta n_1 - \Delta n_2$

$n_4 = n_1 - \Delta n_1 - \Delta n_2 - \Delta n_3$

On the first course we will take n_1 — with constant recruitment of students.

If the recruitment (set) increases, then n_1 should change from year to year by the amount Δn^r:

$$n_1^r = n_1 + \Delta n_1^r,$$

where Δn_1^r – an additional recruitment each year (±)

Then, the total number of students in the university is really studying taking into account the additional set for the first year Δn_1^r every year, n_{1i} –

$$n_t \sum_{i=1}^{4}(n_{1i} + \Delta n_{1i}^r) - 3\Delta n_1 - 2\Delta n_2 - \Delta n_3 , \qquad (1)$$

where n_t — real number of students

$\sum_{i=1}^{4}(n_{1i} + \Delta n_{1i}^r)$ — the maximum possible number of students

Expression (1) must be recalculated every year, taking into account dropout $\sum \Delta n_{dr}$. We introduce the concept of the student's dropout weight from all courses during the year and the remaining student's weight at the university

$$1 = \frac{n_t}{\sum_1^4(n_{1i} + \Delta n_{1i}^r)} + \frac{\sum n_{dr}}{\sum_1^4(n_{1i} + \Delta n_{1i}^r)} = \delta_t + \delta_{dr}, \qquad (2)$$

where $\sum \Delta n_{dr} = 3\Delta n_1 - 2\Delta n_2 - \Delta n_3$,

δ_t — really studying students weight at the university for a current year

δ_{dr} — expelled students weight for a current year.

Impact of courses dropouts 1st, 2nd, 3rd

$\delta_{dr} = \delta\Delta_{n1} + \delta\Delta_{n2} + \delta\Delta_{n3}$ can be estimated, with the introduction of relative dropouts

$$1 = \frac{\delta_{\Delta n_1}}{\delta_{dr}} + \frac{\delta_{\Delta n_2}}{\delta_{dr}} + \frac{\delta_{\Delta n_3}}{\delta_{dr}} = \Delta\delta_{\Delta n_1} + \Delta\delta_{\Delta n_2} + \Delta\delta_{\Delta n_3}, \qquad (3)$$

Obviously, dropping out in the first year will cause maximum damage if we assume $\Delta n_1 = \Delta n_2 = \Delta n_3$

In what follows we denote the quantity

$$\sum_{i=1}^{4}(n_{1i} + \Delta n_{1i}^r) = n_{t_{\max}}$$

The training cost of one student for the first year of education is denoted by C_1, for the second year C_2, for the third year C_3, for the fourth year C_4, in general – C_i, where $i = 1; 2; 3; 4$. Then you can record the training income for the first year

$$I_1 = C_1(n_1 + \Delta n_1^r)$$

For the second year, taking into account the losses:

$$I_2 = C_1(n_1 + \Delta n_1^r) + C_2\,[(n_1 + \Delta n_1^r) - \Delta n_1]$$

For the third year, taking into account the losses:

$$I_3 = C_1(n_1 + \Delta n_1^r) + C_2[(n_1 + \Delta n_1^r) - \Delta n_1] + \\ + C_3[(n_1 + \Delta n_1^r) - \Delta n_1 - \Delta n_2]$$

For the fourth year, taking into account the losses:

$$I_4 = C_1(n_1 + \Delta n_1^r) + C_2[(n_1 + \Delta n_1^r) - \Delta n_1] + \\ + C_3[(n_1 + \Delta n_1^r) - \Delta n_1 - \Delta n_2] + \\ + C_4[(n_1 + \Delta n_1^r) - \Delta n_1 - \Delta n_2 - \Delta n_3]$$

In general, the income for the year during the training of all 4 courses will be written as follows:

$$I_t = I_{t\max} - \Pi_1 - \Pi_2 - \Pi_3. \qquad (4)$$

Where $\Pi_1 = 3C_2\Delta n_1$, $\Pi_2 = 2C_3\Delta n_2$, $\Pi_3 = C_4\Delta n_3$ — loss of funds due to deductions for 1 course, 2 courses, 3 courses.

The maximum possible income for the year (at full courses 1, 2, 3, 4):

$$I_{t\,max} = \sum_1^4 (C_i n_{1i} + C_i \Delta n_{1i}^r) = \sum_1^4 C_i (n_1 + \Delta n_1^r), \qquad (5)$$

Δn_1^r — can in any year turn to zero or becomes a negative value

University's income for one year from all courses

$$\Pi_p = I_t - \Pi_1 - \Pi_2 - \Pi_3 - CA - \\ - RCFA - W - MIF - Travel\ Expenses$$

Where *CA* — current assets (costs per student to making student tickets, student cards, statements for accounting, etc.) every year, in fact, the funds spent on clerical work.

RCFA — rental costs of fixed assets (rent of equipment, laboratory facilities, etc.).

W — wages of the teaching staff, and services.

CA — is estimated or calculated (expert review).

RCFA — in accordance with the renter agreement.

W – calculated taking into account the composition rank.

You need to have the following information for calculating *W*

Number of subjects n_p studied at 1, 2, 3, 4 courses

$$1\text{c} - \sum n_{\text{p1}} = \sum_{j=1}^{n_{\text{p1}}} n_{\text{p1}j}$$
$$2\text{c} - \sum n_{\text{p2}} = \sum_{j=1}^{n_{\text{p2}}} n_{\text{p2}j}$$
$$3\text{c} - \sum n_{\text{p3}} = \sum_{j=1}^{n_{\text{p3}}} n_{\text{p3}j}$$
$$4\text{c} - \sum n_{\text{p4}} = \sum_{j=1}^{n_{\text{p4}}} n_{\text{p4}j}$$

Where index *i* — course, $j = 1, 2, 3 \ldots n_{pij}$, $i = 1, 2, 3, 4$.

In general

$$\sum n_{\text{p}i} = \sum_{i=1}^{4} \sum_{j=1}^{n_{ij}} n_{\text{p}ij}, \qquad (6)$$

Cost of all types of work, *i* — course, *j* — subject.

Types of work: subject n_{ij}	Number of hours t_{ij}	Hour's cost		Cost of all types of work
Lectures	t_{lij}	C_{li}	C_l	$C_{l\Sigma} = \sum_{i=1}^{4}\sum_{j=1}^{n_j} C_l t_{ij}$
Practice	t_{pij}	C_{pi}	C_p	$C_{p\Sigma} = \sum_{i=1}^{4}\sum_{j=1}^{n_j} C_p t_{ij}$
Laboratory	t_{labij}	C_{labi}	C_{lab}	$C_{lab\Sigma} = \sum_{i=1}^{4}\sum_{j=1}^{n_j} C_{lab} t_{ij}$
Consultations	t_{cij}	C_{ci}	C_c	$C_{c\Sigma} = \sum_{i=1}^{4}\sum_{j=1}^{n_j} C_c t_{ij}$
Checking assignments	t_{chij}	C_{chi}	C_{ch}	$C_{ch\Sigma} = \sum_{i=1}^{4}\sum_{j=1}^{n_j} C_{ch} t_{ij}$

$$\text{Matrix } t_{ij} = \begin{vmatrix} t_{11} & t_{12} & \ldots & t_{1j} \\ t_{21} & t_{22} & \ldots & t_{2j} \\ t_{31} & t_{22} & \ldots & t_{3j} \\ t_{41} & t_{22} & \ldots & t_{4j} \end{vmatrix}$$

Positions		Number	
ГД – $О_{кл}$ =	Σ	*n*	Programmer – Σ number *n*
$ПР_1$	Σ		PC operator – Σ number *n*
$ПР_2$	Σ		Office work – Σ number *n*
$ПР_3$	Σ		…
$КТ_1$	Σ		
$КТ_2$	Σ		
$КТ_3$	Σ		Translators – Σ number *n*

Wage calculation scheme

N n/n	Name of posts	Payment type	Ranks	Number of employees	Wage	Wage weight (share of total wages)	Material incentive fund	Income	Profit
i		Hourly, Piece	β	*n*	*W*		*MIF*	I_t	Pr
	ГД		β_1	n_1	W_1	δ_{W_1}	$\sum_1^n MIF = Pr * K_{MIF}$ K_{MIF} – is set	$I_{t\,max} = \sum_1^4 C_i(n_{1i} + \Delta n_{1i}^r\ i - 1,2,3,4$ - *courses*	$Pr = I_t - П_1 - П_2 - П_3 - \sum_1^n W_i - MIF - CA - RCFA$
	$ПР_1$		β_2	n_2	W_2	δ_{W_2}			
	$ПР_2$		β_3	n_3	W_3	δ_{W_3}			
	$ПР_3$		β_4	n_4	W_4	δ_{W_4}			
	$КТ_1$		β_5	n_5	W_5	δ_{W_5}			
	$КТ_2$		β_6	n_6	W_6	δ_{W_6}			
	$КТ_3$		β_7	n_7	W_7	δ_{W_7}			
	$П_{prc}$		β_8	n_8	$W_{8\ 1,2,3}$	$\delta_{W_{8\ 1.2.3}}$			
	ОПК		β_9	n_9	$W_{9\ 1,2,3}$	$\delta_{W_{9\ 1.2.3}}$			
	etc.		etc.	etc.	etc.	etc.			
n			$\sum_i^n \beta_i$	$\sum_i^n n_i$	$\sum_i^n W_i$	$\sum_1^n \delta_{W_i} = 1$			

MIF — mandatory payments under the Labor Code, incentives (based on profits), social payments (sick leave), insurance of employees; I_t — is calculated using expressions (1–4); *CA* — must include travel expenses

Number of rank professors β_2,β_3,β_4				*W* — wage
n_2	β_2	$П_{P1}$	Language knowledge, add. ranks | business trips	$\Sigma_{P1} + \Sigma_{\text{travel expenses*}}$
n_3	β_3	$П_{P2}$	local	Σ_{P2} – local
n_4	β_4	$П_{P3}$	without language knowledge, additional titles	$\Sigma_{P3} + \Sigma_{\text{travel expenses}}$.
Number of Ph.D. rank β_5,β_6,β_7				
n_5	β_5	$К_{Т1}$	Language knowledge	$\Sigma_{K1} + \Sigma_{\text{travel expenses}}$
n_6	β_6	$К_{Т2}$	local	Σ_{K2}
n_7	β_7	$К_{Т3}$	local	Σ_{K3}
Programmers				
n_{81}	β_{81}	$П_{РГС1}$	local	$\Sigma_{РГС1}$
n_{82}	β_{82}	$П_{РГС2}$	NUS – exit	$\Sigma_{РГС2} + \Sigma_{\text{travel expenses}}$.
n_{83}	β_{83}	$П_{РГС3}$	NUS – restricted to travel abroad	$\Sigma_{РГС3}$
PC Operators				
n_{91}	β_{91}	$О_{ПК1}$	local	$\Sigma_{ОПК1}$
n_{92}	β_{92}	$О_{ПК2}$	NUS – exit	$\Sigma_{ОПК2} + \Sigma_{\text{travel expenses}}$.
n_{93}	β_{93}	$О_{ПК3}$	NUS – restricted to travel abroad	$\Sigma_{ОПК3}$
Etc.				**Note:* Travel expenses go to the *CA*

Wage

$$\sum W = W_1 n_1 + W_2 n_2 + W_3 n_3 + W_4 n_4 + W_5 n_5 + \\ + W_6 n_6 + W_7 n_7 + W_8 (n_{81} + n_{82} + n_{83}) + \\ + W_9 (n_{91} + n_{92} + n_{93}) + \sum etc. \quad (7)$$

Wages Fund $WF = \Sigma W$

$$WF = \sum_{i=1}^{m=7} W_i n_i + W_{m+1}(n_{81} + n_{82} + n_{83}) + \\ + W_{m+2}(n_{91} + n_{92} + n_{93}) \quad (8)$$

In a more general form

$$WF = \sum_n^1 W_i n_i, \quad (9)$$

But it must be taken into account that

$$n_8 = n_{81} + n_{82} + n_{83} = \sum_{\kappa=1}^{n_k} n_{8\kappa}$$

$$n_9 = n_{91} + n_{92} + n_{93} = \sum_{j=1}^{n_j} n_{9j}$$

The normalization condition is expressed in terms of weight fractions W_i

$$1 = \delta_{W1} + \delta_{W2} + \delta_{W3} + \delta_{W4} + \delta_{W5} + \delta_{W6} + \delta_{W7} + \\ + \delta_{W8} + \delta_{W9} + \delta_{Wetc} = \sum_{i=1}^{n} \delta_{Wi}, \quad (10)$$

Where $\delta_{Wi} = (\delta_{Wi} n_i)/WF$

These values can be used for *WF* analysis.

In turn, W_i can be expressed through the rank of an employee β_i and the average wage per employee $<W_i>$

To do this, we calculate the total number of employees at the university, taking into account the fact that $n_8 = n_{81} + n_{82} + n_{83} + etc$, $n_9 = n_{91} + n_{92} + n_{93} + etc$.

$$N = \sum_{i=1}^{n} n_i \quad (11)$$

We calculate the weighted average rank of employees $<\beta_i>$, per one worker

$$< \beta >= \frac{\sum_1^n \beta_i}{\sum_1^n n_i \beta_i}. \quad (12)$$

Then the wage of a middle-ranking employee will be

$$< W >_{<\beta>} = \frac{WF}{\sum_1^n n_i \beta_i} = \frac{WF}{\sum_1^n \beta_i} < \beta >. \quad (13)$$

Expression (13) including (9) can be rewritten in a different form (depending on the need)

$$< W >_{<\beta>} = \frac{\sum_1^n W_i * n_i}{\sum_1^n n_i \beta_i} = \frac{\sum_1^n W * n_i}{\sum_1^n \beta_i} < \beta >. \quad (14)$$

With simplification:

$$< W >_{<\beta>} = \sum_1^n \frac{W_i * n_i}{n_i \beta_i} = \sum_1^n \frac{W_i}{\beta_i} = \frac{WF}{\sum_1^n \beta_i} < \beta >. \quad (15)$$

Expression (15) makes it possible to calculate the *WF*, knowing $<W>_{<\beta>}$ and using $<\beta>$, $\sum_n^1 \beta_i$

$$WF = < W >_{<\beta>} * \frac{\sum_1^n \beta_i}{<\beta>}. \quad (16)$$

Expression (16) will make it possible to optimize the *WF* by varying the rank β_i, and taking into account (12), the number of workers n_i with this rank.

Balance profit coefficient C_{BP} plays an important role during the analysis of the work of any organization (structure). The profitability factor C_{PF} is calculated on its basis. In case the university will provide other services (except training), the C_{BP} coefficient will be written as follows:

$$C_{BPi} = \text{ПБ}/\text{ПР} = (I_t - \Pi_1 - \Pi_2 - \Pi_3 - WF - CA - \\ - RCFA - MIF - Trav.E + SERV)/(I_t - \Pi_1 - \Pi_2 - \Pi_3)$$

$$C_{BP} = 1 - \delta_{WF} - \delta_{CA} - \delta_{RCFA} - \delta_{MIF} - \delta_{Trav.E.} + \delta_{serv} \quad (17)$$

Where δ_{WF}, δ_{CA}, δ_{RCFA}, δ_{MIF}, $\delta_{Trav.E.} < 1$. It follows that C_{BP} can not be more than 1, $C_{BP} < 1$ — in the absence of additional services provided by the university, SERV.

Such services may be:

Profit from lending to other organizations, profit from investments, etc., under such conditions C_{BP} may be $C_{BP} \geq 1$, depending on these services.

Coefficient of profitability

$$C_{Pf} = \frac{\text{ПБ}}{\sum_1^4 C_i(n_1 + \Delta n_1^r) - (C_2 + C_3 + C_4)\Delta n_1 - (C_3 + C_4)\Delta n_2 - C_4 \Delta n_3}. \quad (18)$$

where C_i — training cost on the *i-st course*

n_1 — number of students who are recruited for the first year

Δn_1^r — The increase in the number of students recruited for the first year

Converting, we get:

$$C_{PF} = 1 - \frac{WF + CA + RCFA + Trav.E. - SERV}{\sum_1^4 C_i(n_1 + \Delta n_1^r) - (C_2 + C_3 + C_4)\Delta n_1 - (C_3 + C_4)\Delta n_2 - C_4 \Delta n_3}. \quad (19)$$

It follows from expression (19) that the profitability coefficient may increase due to additional services (SERV), or by increasing the training cost. Ideally, it can reach the value $C_{PF} \geq 1$, only by decreasing ($WF + CA + RCFA + Trav.E.$) and increasing SERV and $C_i(n_1 + \Delta n_1^r)$ at $\Delta n_1, \Delta n_2, \Delta n_3 = 0$.

If $C_{PF} \approx 1$ is closer, then profitability factor is higher.

RESULTS OF THE RESEARCH.

This methodology has found wide application in planning the international activities of the Admiral Makarov National University of Shipbuilding. In particular, comprehensive calculations were carried out before making decisions on concluding contracts of joint educational projects with Chinese partners.

Here is an example of conducting and analyzing calculations with a partner from Jiangsu Province, Zhoushan City (University).

Calculations of the main profitability factor indicators were carried out for the implementation of a joint program of the bachelor's preparation with the University:

Wage fund (*WF*) compiled 339 877 RMB.

Current assets (*CA*) compiled 34 778 RMB. Rental costs of fixed assets (*RCFA*) were 264800 RMB. Travel expenses (*Trav. E.*) 168 953 RMB. There are no additional services provided by the University (*SERV*).

The average percentage of annual drop-out of students is 5.75%, based on the experience of similar programs. Let us take this value for Δn_1, Δn_2, Δn_3.

Training cost *C* for one student per year is 4455 RMB.

For the entire period of study is 17820 RMB.

According to these values, we calculate the profitability factor of cooperation with the University for a different number of students in the group.

For 7 students:

$$C_{PF} = 1 - \frac{339\,877 + 34\,778 + 264\,800 + 168\,953}{17\,820 \times 7 - 4\,455 + 4\,455 + 4\,455 \times 7 \times 5{,}75\,\% - 4\,455 + 4\,455 \times 7 \times 5{,}75\,\% - 4455 \times 7 \times 5{,}75\,\%}$$

$$= 1 - \frac{808\,408}{124\,740 - 5379{,}4125 - 3586{,}275 - 1793{,}1375} = 1 - \frac{808\,408}{113\,981{,}175} \approx -6{,}09$$

If the value of the profitability factor is negative (C_{PF} = –6,09), the program is impractical to run. A successful joint educational project can be considered one in which $C_{PF} \geq 0$. Therefore, a calculation was carried out for groups of students of 15, 25, 35, 45, 50, 55, 60 and 90 persons respectively, the results of which are presented in Table 1 and Fig. 1.

As can be seen from the calculations, the joint program with the University becomes profitable with the 50 students in it. Therefore, it is advisable to proceed to the project implementation only after analyzing the entrants' market potential in Jiangsu Province. The viability of this project will be a set of two groups of 25 people each.

Table 1. Results of calculating the profitability factor of a joint project with the Chinese University

n_1	7	15	25	35	45	50	55	60	90
C_{PF}	– 6,09	– 2,31	– 0,99	– 0,42	– 0,1	0,007	0,097	0,173	0,448

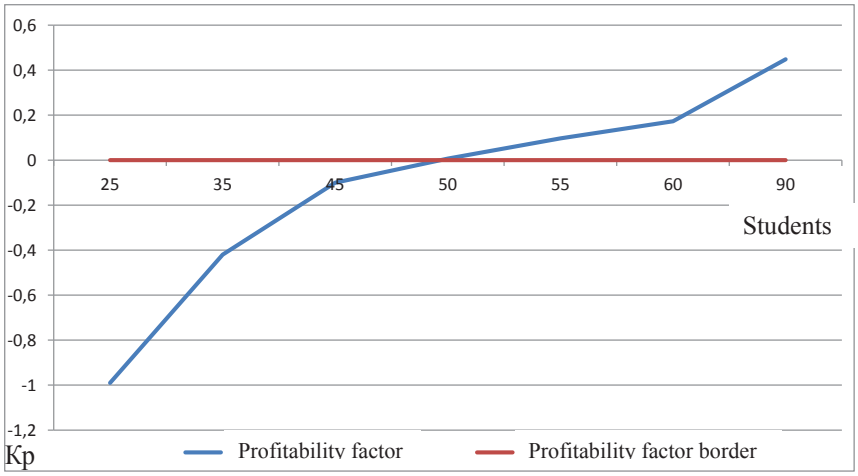

Fig. 1. The schedule of calculating the profitability factor of a joint project with the University with the number of students from 25 to 90.

CONCLUSIONS.

1. An innovative methodology of calculating of the profitability factor of a joint educational project was developed with a foreign university. 2. Calculations of the joint educational program with the Chinese University in Zhenjiang City, Jiangsu Province were made according to the methodology. The optimal conditions for the implementation of joint projects were determined. The viability of the project will be an annual set of two groups of 25 people each.

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