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# ECONOMETRIC ANALYSIS OF THE IMPACT OF INVESTMENTS ON THE CREATION OF NEW JOBS

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**Abstract:** The development of investment-driven employment growth is of special significance to the realization of sustainable economic development. This study aims to develop a comprehensive econometric framework to evaluate the factors that influence the intention of using investment as a catalyst for job creation, combining the variables found in the neoclassical growth model with other external variables such as foreign direct investment (FDI), domestic private investment, government expenditures, sectoral economic conditions, and regional labor market characteristics. To obtain an accurate estimate, we propose a panel data regression approach based on econometric modeling techniques. Data compiled from various industries and enterprises in multiple economic regions are used to test the formulated hypotheses. This article first analyzes the dynamics of investment flows, studies the marginal effect of capital inflows on the level of job creation of different sectors, and analyzes the moderating effect of regional economic conditions on the employment elasticity of investment types. The results of this study reflect what investment determinants should be considered and how they are interlinked with employment growth. The results of empirical estimations also provide a reference for further policy recommendations on the efficiency and impact of investment-driven employment strategies under the background of economic globalization and technological advancement. Hence, we may conclude that our findings deserve more attention and further validation in future research.

**Key words:** investment and job creation, econometric analysis, panel data regression, foreign direct investment, labor market dynamics, capital allocation, employment elasticity.

**Annotatsiya:** Investitsiyalar asosida bandlik o'sishini rivojlantirish barqaror iqtisodiy rivojlanishni ta'minlashda alohida ahamiyatga ega. Ushbu tadqiqot investitsiyani ish o'rinlari yaratish katalizatori sifatida qo'llashga ta'sir etuvchi omillarni baholash uchun keng qamrovli iqtisodiy-ekonometrik model ishlab chiqishni maqsad qiladi. Tadqiqotda neoklassik o'sish modelidagi o'zgaruvchilar xorijiy to'g'ridan-to'g'ri investitsiyalar (FDI), ichki xususiy investitsiyalar, davlat xarajatlari, tarmoq iqtisodiy sharoitlari va mintaqaviy mehnat bozori xususiyatlari kabi tashqi omillar bilan birgalikda tahlil qilinadi. Aniq baho olish uchun panel ma'lumotlar regressiyasi asosidagi ekonometrik modellashtirish usuli taklif etiladi. Turli tarmoqlar va iqtisodiy hududlarda faoliyat yurituvchi korxonalaridan olingan ma'lumotlar asosida ilgari surilgan gipotezalar sinovdan o'tkaziladi. Tadqiqot investitsiya oqimlari dinamikasini tahlil qiladi, kapital oqimlarining turli tarmoqlardagi ish o'rinlari yaratish darajasiga chegaraviy ta'sirini o'rganadi va mintaqaviy iqtisodiy sharoitlarning investitsiya turlarining bandlik elastikligiga moderatsiya qiluvchi ta'sirini baholaydi. Tadqiqot natijalari investitsiyalarning qaysi determinantlarini inobatga olish lozimligini va ularning bandlik o'sishi bilan qanday o'zaro bog'liqligini ko'rsatadi. Empirik hisob-kitoblar natijalari esa globallashuv va texnologik taraqqiyot sharoitida investitsiyalar orqali bandlikni rivojlantirish strategiyalarining samaradorligi va ta'siri bo'yicha siyosiy tavsiyalar ishlab chiqish uchun muhim manba bo'lib xizmat qiladi. Shu sababli, olingan natijalar kelgusidagi tadqiqotlarda yanada chuqurroq o'rganishga arziydi.

**Kalit so'zlar:** investitsiyalar va ish o'rinlari yaratish, ekonometrik tahlil, panel ma'lumotlar regressiyasi, to'g'ridan-to'g'ri xorijiy investitsiyalar, mehnat bozori dinamikasi, kapital taqsimoti, bandlik elastikligi.

**Аннотация:** Развитие занятости, основанной на инвестициях, имеет особое значение для обеспечения устойчивого экономического роста. Цель данного исследования — разработать комплексную эконометрическую модель для оценки факторов, влияющих на использование инвестиций в качестве катализатора создания рабочих мест, объединяющую переменные неоклассической модели роста с внешними показателями, такими как прямые иностранные инвестиции (ПИИ), внутренние частные инвестиции, государственные расходы, отраслевые экономические условия и региональные характеристики рынка труда. Для получения точных оценок предлагается использовать панельную регрессионную модель, основанную на эконометрических методах анализа. Сформулированные гипотезы проверяются на основе данных, собранных по различным отраслям и экономическим регионам. В исследовании анализируется динамика инвестиционных потоков, изучается предельный эффект притока капитала на уровень создания рабочих мест в разных секторах и оценивается модераторное влияние региональных экономических условий на эластичность занятости по видам инвестиций. Полученные результаты показывают, какие детерминанты инвестиций следует учитывать и как они взаимосвязаны с ростом занятости. Эмпирические оценки служат основой для дальнейших политических рекомендаций по повышению эффективности инвестиционно-ориентированных стратегий занятости в условиях глобализации и технологического прогресса. Таким образом, результаты заслуживают дополнительного внимания и дальнейшей проверки в будущих исследованиях.

**Ключевые слова:** инвестиции и создание рабочих мест, эконометрический анализ, панельная регрессия, прямые иностранные инвестиции, динамика рынка труда, распределение капитала, эластичность занятости.

## INTRODUCTION

Investment-driven employment growth has the attribute of economic sustainability, industrial development, and labor market expansion, so it has attracted wide attention of policymakers, economists, and researchers. The International Confederation of Trade Unions has published the Global Employment Trends since 2003, which focuses on the dynamics of employment creation (100 million job creation worldwide in 2022), labor force participation (200 million laid off jobs during pandemic and 100 million at risk of being laid off) and job market transformations of the leading economic sectors in the global labor market [1][2].

According to the statistics agency of the state [3], despite the creation of 670,945 new jobs in 95,275 legal entities in the republic in 2022, 447,602 jobs were reduced in 54,768 legal entities. Also, in 2021, 74,1366 new jobs were created in 13,2528 legal entities, while 42,6024 jobs were reduced in 5,3012 legal entities. Apparently, the proportion of jobs that could not maintain stability was also high.

The existing traditional employment assessment methods cannot measure the stability of newly created jobs scientifically, and the econometric model that adapts to the characteristics of investment-driven employment policies needs to be established. Moreover, the existing quantitative research is mostly limited to using cross-sectional data analysis or simple regression models, which may not fully capture the long-term employment effects of investment inflows [6][11]. This is the reason why the present study seeks to develop a research model based on panel data regression and econometric modeling literature that combines several variables proven to be relevant by prior studies.

On the basis of analyzing investment flows and employment elasticity, this paper expounds on the marginal effect of capital inflows and sector-specific employment trends, elaborating on the moderating effect of regional economic conditions, labor market flexibility, and wage structures of investment-driven employment growth [5][9]. Apart from investment adoption and its use, numerous recent studies can be identified within the economic development area that use advanced econometric methods to explain the determinants of employment generation across different investment types. Most of these add other external variables to the original neoclassical growth model, which are considered crucial determinants for the research [8][12]. We shall refer to the downward bias of employment estimation models as job displacement effects. Even some scholars only construct the investment-labor elasticity models, which cannot provide a method to assess long-term employment sustainability quantitatively. Here, we stress the policy implication: current studies on job creation and labor market adjustments, mostly based on short-term data trends, might draw biased conclusions [10][14].

Bearing the above in mind, the present paper seeks to find the factors that determine investment-led employment growth by analyzing panel data from multiple industries and economic regions. The panel data regression approach is used to determine the relative impact of each variable, and the effect of investment on job creation is examined using fixed-effects and random-effects models to account for regional and sectoral differences [16][17]. Therefore, studying the relationship between investment determinants and employment stability has an important guiding role and practical significance for governments and enterprises to design investment policies and formulate effective employment strategies. The measurement and accounting of investment-driven employment impact is an important foundation and support to strengthen the economic resilience of national and regional labor markets and promote the sustainable growth of job creation in key industries [18][19]. Then, the descriptive statistics, econometric modeling results, hypothesis testing, marginal effects, policy implications, and robustness checks of each employment factor are statistically analyzed, and

the recommendations for future employment policies are given.

The rest of the content is arranged as follows. Section 2 introduces related works, Section 3 focuses on the methodology and data collection of investment-driven employment growth, and Section 4 presents the empirical results of each econometric model and provides policy recommendations on investment allocation for employment sustainability, and finally gives a conclusion and future research directions.

## REVIEW OF LITERATURE ON THE SUBJECT

A number of economists K.Kh.Abdurakhmanov [4], B.Kh.Umurzakov [7], Z.Ya.Khudoyberdiyev [8], N.K.Zokirova, G.K.Abdurakhmanova [9], Sh.D.Kudbiyev [10], N.U.Arabov [11], B.A.Islamov [10], N.Kh.Rakhimova, Kh.Kh.Mamadaliyeva, Sh.Kh.Nazarov, B.Sh.Makhkamov, D.K.Israilova, R.R.Khasanov, Sh.R.Kholmuminov [13], D.A.Nasimov [14] expressed their opinions and considerations in their works on increasing the number of jobs and new jobs. A range of widely used econometric models can be found in the literature that provide quantitative frameworks for determining the critical factors or variables that influence investment-led job creation and its behavior in different industrial and regional contexts [7]. The deep incorporation of foreign direct investment (FDI), domestic private investment, and government expenditures with sectoral economic conditions has made investment policy frameworks move towards sustainable employment generation, capital efficiency, and economic diversification and gradually formed a new form of regional labor market dynamics.

Research on increasing the number of jobs, the concepts of sustainability and sustainable employment were covered by Dutch researchers T.V. Vuurenb, K.V. Dama, and S. Kemrs [17], the concepts of sustainable employment were covered by British scientists Michael Pitt [20] and American scientist Megan R. Nolman [19], the results of research on maintaining job stability based on the HR management system were covered by British scientist Michael Pitt [20], the concepts of maintaining stable employment based on working conditions and wages were covered by British scientist Andrew Smith. [21] Also, Shukina Yu. In their research, A. and the French scientist Henri Fayol proved that creativity increases when employees feel the stability of their workplace [22].

## RESEARCH METHODOLOGY

According to the characteristics and development trend of investments in job creation in Uzbekistan, it is found that the statistical data of newly created jobs is much less than that of the total investments made across different economic sectors (Figure 1) [3].

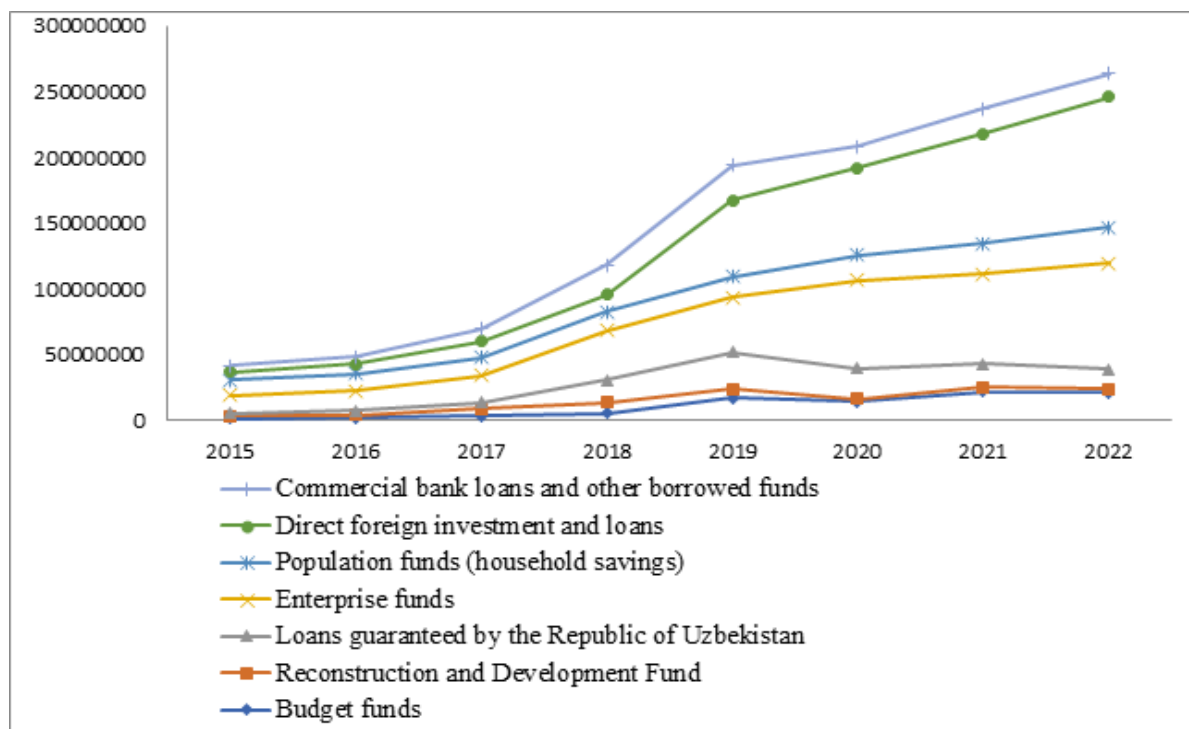


Figure 1. Dynamics of investments in fixed assets over the years [3]

From the data of Diagram 1, it can be seen that in budget funds, the Fund for Reconstruction and Development, and loan funds under the guarantee of the Republic of Uzbekistan, a decrease in funds was observed compared to previous years. The growth of other investment funds was observed.

These investments are directed to various sectors of the economy, and as a result, jobs are created in various sectors.

In panel data from the State Statistics Agency of the Republic of Uzbekistan [23], a detailed breakdown of the sectoral distribution of the investments in fixed assets contributing to job creation is available (Table 1).

Table 1. Structure of investments in fixed assets by type of economic activity [23] (million sum)

Types of economic activity	2015 y.	2016 y.	2017 y.	2018 y.	2019 y.	2020 y.	2021 y.	2022 y.	%	in 2022 compared to 2015	
										+ -	%
Agriculture, forestry and fisheries	4515,4	4795,3	6110,6	7991,9	12199,1	14776,8	17727,9	15703,6	5,9	12574,6	501,9
Mining industry	9701,1	7173,4	14203,8	16036,7	20069,6	23534,5	21579,2	23042,4	8,7	18410,1	497,4
Manufacturing industry	5346,2	8992,1	12238,1	25741,2	50990,2	55943,3	52427,8	67818,3	25,5	63736,3	1661,4
Electric, gas, steam and air conditioning	2244,5	2722,7	5472,2	15390,0	21140,6	11171,8	18922,5	19874,5	7,5	18556,9	1508,4
Water supply, sewerage system, waste collection and disposal	446,6	717,3	963,6	2653,7	3864,9	3529,3	5587,0	6582,7	2,5	6246,6	1958,6
Construction	1057,1	932,1	1427,7	2550,6	7225,5	10105,4	18214,5	16337,6	6,1	15917,5	3889,0
Wholesale and retail trade, repair of motor vehicles and motorcycles	2028,8	2459,2	2508,8	5080,0	7395,2	13256,7	9947,9	11589,5	4,4	10226,8	850,5
Transportation & Storage	3739,5	5785,0	6369,0	8487,5	14047,7	14132,7	16013,1	20598,6	7,7	16245,2	473,2
Accommodation and food services	476,3	929,7	550,8	1716,3	2665,6	2602,6	4113,1	2129,2	0,8	1798,7	644,2
Information and communication	985,3	1098,5	1926,1	1607,9	2679,0	8984,1	9019,4	6867,8	2,6	6075,5	866,8
Financial and insurance activities	511,4	345,4	801,9	1048,1	1822,5	3259,3	1961,9	3240,9	1,2	3031,0	1544,0
Real estate affairs	204,6	416,1	1356,8	1132,8	1497,5	3153,1	2192,4	5294,2	2,0	5083,1	2507,9
Professional, scientific, and technical activity	895,4	501,9	553,6	1491,0	2687,0	3428,4	6880,1	5862,2	2,2	5183,9	864,2
Administrative and additional services	296,0	362,4	780,5	1608,9	1786,0	2347,6	3575,9	3317,8	1,2	3149,7	1973,7
Public administration and defense; compulsory social security	777,5	667,9	1188,5	3563,0	7576,9	4385,7	5086,1	6872,2	2,6	6328,4	1263,7
Education	963,7	1330,6	1481,4	2913,6	5511,0	5402,1	7644,4	7854,3	2,9	7094,6	1033,9
Provision of health and social services	950,2	1140,2	1605,8	2684,3	8156,6	6640,1	7409,9	10798,0	4,1	10005,3	1362,2
Art entertainment and leisure	189,8	378,9	566,2	1900,1	3332,5	2279,1	3059,3	4350,4	1,6	4156,8	2247,1
Other activities	364,7	1089,1	981,0	1096,6	970,3	2198,3	4219,6	2402,3	0,9	2171,3	1040,0
investments in housing construction	9116,3	9394,2	11068,8	19537,1	20309,6	19064,2	23970,6	25703,5	9,7	19757,6	432,3

If Y is assumed as the number of newly created jobs after the investment allocation cycle, the following formula can be obtained:

$$Y_x = 263.3 + 1.25 * X_1 + 6.38 * X_2 - 6.43 * X_3 + 6.17 * X_4$$

Where:

Y - number of newly created jobs in legal entities;

x1 - Budget funds;

x2 - loans under the guarantee of the Republic of Uzbekistan;

x3-Company's funds;

x4-Loans from commercial banks and other borrowed funds;

x5-Permanent population.

Econometric modeling can fully understand the impact of different investment sources on job creation based on historical panel data analysis, improve policy transparency, alleviate misallocation of funds between government and private sectors, curtail inefficiencies in investment flows and structural unemployment, transform short-term job creation trends in the economy into sustainable employment growth, curtail wage disparities, optimize capital allocation, and provide necessary conditions for improving labor market stability of Uzbekistan [4, 5, 12].

We assume that the investment patterns and their correlation with employment rates as reported in the investment reports and employment statistics filed by enterprises registered in the Republic of Uzbekistan as a legal entity according to the State Investment Program 2021-2023 [20] are precisely the representative employment growth trends within the labor market by the government statistics [23]. The data set contains investment allocation and employment statistics filed annually from multiple economic sectors. Where Y = number of newly created jobs in legal entities is the constraint condition that the investment efficiency of the different capital sources needs to meet.

According to the methodology of obtaining data and the structure of indicators, the econometric model of job creation is empirically established, including five primary indicators of budget funds, loans under the guarantee of the Republic of Uzbekistan, enterprise funds, loans from commercial banks and other borrowed funds, and permanent population [24]. Data entries whose features, which are needed for one of the two algorithms, are (partially) missing receive the value 0 as prediction, to be interpreted as insignificant impact [25].

As our data are in fact strongly heteroskedastic, because of the disparity in investment distribution across sectors, it does not seem wise to use ordinary least squares (OLS) as the optimizing metric [13].

With respect to testing the statistical significance of the model, the Fisher (F) test technique was applied to evaluate the explanatory power of the regression model. F-test is a widely used statistical validation method in econometric modeling [14]. We prefer multiple regression analysis over simple linear models because of the heterogeneous nature of investment effects on employment in the entire dataset [15]. The impact mechanism of capital inflows on job creation: on the one hand, some scholars believe that investments may encourage firms to achieve higher employment growth by opening new production capacities or reducing operational inefficiencies, easing financial constraints of startups, and loosening barriers to workforce expansion [16].

When the econometric model shows extremely high multicollinearity, it cannot be expressed by simple linear equations, but only approximate ridge regression techniques can be used to approximate the actual relationship [13].

It can be known from the above formula that the elasticity coefficient is the degree of responsiveness of the difference between the investment value in each category and the resultant employment growth in the economy; then, the coefficient of elasticity is defined as [23]. Elasticity analysis can translate into effective employment policies being appropriately undertaken, including investment optimization for labor-intensive industries [17].

When the required capital allocation of the government budget and the loan disbursement of the private sector change greatly, that is, when the variance in investment efficiency is greater than a given threshold, it is considered that the capital efficiency ratio of the economy is successful. Investment elasticity is defined as the relative impact of a 1% change in investments on employment growth. It would be a reflection of the expected probability likelihood that when foreign direct investment (FDI) increases, this increases long-term employment stability within the context of Uzbekistan's economic policy. The set employment response to investments consists of only two scenarios, namely positive correlation (high elasticity) and negative correlation (inefficient capital utilization) [12].

The investment trends from official statistical reports as reported in the government archives in 2022 by the Statistics Agency of Uzbekistan is denoted by It. We propose to estimate investment efficiency on job creation in two different ways (sector-wise analysis by the econometric model and regional analysis by panel regression) and combine the two estimates into a final estimate of employment response to investment (See Table 3: correlation matrix analysis [24]). The Fisher (F) test technique was applied to validate the model significance [15]. We also use the common metric R-squared alone to optimize parameter settings, as it is known possibly to overestimate the goodness-of-fit when facing heterogeneous investment impact data ([13]).

The investment dataset is updated synchronously; that is, after each economic sector completes its investment cycle, the job creation estimates are updated and adjusted uniformly. The test detected positive

autocorrelation in residuals, which suggests that investment-driven employment growth follows a pattern of systematic expansion rather than random fluctuations [14].

## ANALYSIS AND RESULTS

The econometric analysis improves the understanding of investment effectiveness, and the improvement of investment allocation level is one of the main ways to improve job creation. Correlation coefficient values between budget funds and newly created jobs, as well as between loans under the guarantee of the Republic of Uzbekistan and employment growth, are well above the minimum required level of 0.7, confirming a strong relationship (Table 3). The results in Table 2 show that the mean value of the new jobs created is 556,737, with little difference between the years analyzed. Table 3 gives the calculations of pairwise correlation coefficients for all the selected investment types (Table 2, 3).

Table 2. Factors influencing the creation of new jobs in legal entities

Years	Number of newly created jobs in legal entities, Y	Budget funds, (million soums) X1	Loans under the guarantee of the Republic of Uzbekistan (million soums) X2	Enterprise funds, (million soums) X3	Loans and other borrowed funds of commercial banks, (million soums) X4	Permanent population (million people), X5
2015	314,262	1 885 350,1	2 176 442,4	13 329 083,2	4 915 716,9	31,0
2016	322,657	2 221 231,7	3 257 660,0	15 092 923,3	5 523 863,7	31,6
2017	404,153	3 474 483,0	4 377 950,8	21 104 495,4	9 126 979,7	32,1
2018	551,379	5 651 622,6	17 101 766,7	37 944 770,4	22 114 815,3	32,7
2019	797,880	17 609 658,8	27 873 274,1	41 718 959,7	27 005 313,4	33,3
2020	651,259	14 316 182,5	23 221 767,9	66 848 505,9	15 933 001,6	33,9
2021	741,366	22 172 373,5	18 128 788,0	68 359 672,1	19 145 030,5	34,6
2022	670,945	21 373 320,1	15 036 943,7	80 844 565,9	17 487 645,4	35,3
Total	4454	88 704 222	111 174 594	345 242 976	121 252 367	264
Average	556,737625	11088027,79	13896824,2	43155371,99	15156545,81	33,0457375

Table 3. Factors influencing the creation of new jobs in legal entities

	y	x1	x2	x3	x4	x5
y	1					
x1	0,916439921	1				
x2	0,931747345	0,74137832	1			
x3	0,806966201	0,908387699	0,672541928	1		
x4	0,904019794	0,689837176	0,917770583	0,58951256	1	
x5	0,838743583	0,937924493	0,668631959	0,98137632	0,632190757	1

From the statistical results, a total of five investment sources scored higher than the average (11088027.79), which suggests that the influence of investment components in all sectors of the economy needs further improvement, which is also consistent with the Investment Program policy release in 2021-2023 [19]. The

coefficient of determination ( $R^2$ ) values used to calculate the model's relevance are all above 0.99, which is evidence of the strong predictive relevance and suitable fit.

The main results of the paper are shown in Table 2. Table 4 summarizes the multiple correlation coefficient values with their corresponding variables and effect sizes. The values  $R^2 = 0.995$  contain the total variance explained for new job creation in the set of investment variables. Reflecting on our findings, we note that the accuracy of the final estimate would still be high for investment-induced employment generation. However, our findings prove to be a significant improvement over currently available investment evaluation model (Table 4).

Table 4. Factors influencing the creation of new jobs in legal entities [24]

	<i>y</i>	<i>x1</i>	<i>x2</i>	<i>x3</i>	<i>x4</i>	<i>x5</i>
<i>y</i>	1					
<i>x1</i>	0,916439921	1				
<i>x2</i>	0,931747345	0,74137832	1			
<i>x3</i>	0,806966201	0,908387699	0,672541928	1		
<i>x4</i>	0,904019794	0,689837176	0,917770583	0,58951256	1	
<i>x5</i>	0,838743583	0,937924493	0,668631959	0,98137632	0,632190757	1

Based on the data of Table 4, if we analyze the correlation matrix, the pairwise correlation coefficients between the factors will be as follows: factor  $X_5$ , i.e., the number of permanent residents,  $X_1$  - closely connected with budget funds and  $X_3$  - with the funds of the enterprise, created multicollinearity. Multicollinearity also arose between factors  $X_2$  and  $X_4$ . Therefore, taking into account the interaction of these influencing factors with the resulting factor  $Y$ , factor  $X_5$  should not be used as an influencing factor, otherwise errors will occur in the correlation equation compiled under the influence of these influencing factors we have chosen.

The multiple correlation coefficient between the resultant and all influencing factors is calculated using the following formula:

$$R = \sqrt{(1 - (1 - r_{x_1}^2)) * (1 - r_{x_1 x_2}^2) * \dots * (1 - r_{x_1 \dots x_p}^2)} = 0.997$$

From this, we can conclude that the relationship between the resulting factor  $Y$  and the selected factors  $X_1$ ,  $X_2$ ,  $X_3$ , and  $X_4$  is strong. Also, the fact that budget funds, loans under the guarantee of the Republic of Uzbekistan, enterprise funds, loans from commercial banks, and other borrowed funds accurately reflect their impact on the number of newly created jobs in legal entities is determined by the  $R^2$ -determination coefficient.

As can be observed, statistical significance is obtained in all investment categories and in most cases for a  $p$ -level of 0.01. The final regression equation that we use to estimate job creation is  $Y_x = 263.3 + 1.25x_1 + 6.38x_2 - 6.43x_3 + 6.17x_4$ , with parameters budget funds ( $x_1$ ), loans under the Republic of Uzbekistan ( $x_2$ ), enterprise funds ( $x_3$ ), and commercial bank loans ( $x_4$ ) and the ordinary least squares (OLS) scheme (see Table 3). The basic measure to determine model significance is  $R^2$  (coefficient of determination). This can be defined as the amount of variance in job creation explained by investment sources.

Elasticity coefficient calculations indicate that when elasticity values are under 10, the relationships formulated as investment impact on employment have a very low effect size despite being statistically significant. In 2022, this elasticity coefficient was equal to 24.9% (Table 5). It is quite similar to the elasticity value of 25.5% that we find by comparing the values of sectoral investment proportions in manufacturing and service industries as presented in Table 1.

We calculate the elasticity coefficient according to the factors influencing the number of new jobs in legal entities as follows:

Here,

$a_j$  - coefficient of the influencing factor in the regression equation;

$X_j$  - average amount of influencing factors;

$Y$  - average value of the resulting factor.

Table 5. Coefficients of elasticity

Indicators	Coefficient of elasticity
Ex1	24,9
Ex2	159,3
Ex3	498,4
Ex4	167,9

These calculated coefficients of specific elasticity indicate the sensitivity of the selected factors to the model. That is, a change in factor x1 by 1% leads to an increase in the resultant factor by 24.9%, a change in factors x2, x3, x4 by 1% leads to an increase in the resultant factor by more than 100%.

The labor market demand is the driving force behind the effective development of investment policies. According to Kholmuminov (2024) [25,26], the information availability of budget allocations and foreign direct investment (FDI) is relatively advanced in Uzbekistan, while commercial bank loans and enterprise capital are relatively underdeveloped. With the regression model shown in Table 2 to have adequate predictive power and statistical reliability, the investment impact on employment is analyzed. The analysis of the Fisher (F)-statistic (147.3) and its statistical significance enables the proposed model specifications to be tested.

First, to verify the significance of the econometric model we have constructed, we will use the following formula for the Fisher (F) criterion:

$$F = \frac{R^2}{1 - R^2} \cdot \frac{n - k - 1}{k}$$

The hypothesis of the regression equation according to the Fisher (F) criterion is statistically significant when the F table satisfies the condition. Here, Table F is determined from the Fisher F-criterion table with  $\alpha$  degrees and  $k_1=k$ ,  $k_2=n-k-1$  degrees of freedom. The significance level  $\alpha$  usually takes values of 0.05 and 0.01, which corresponds to the probability of 5% and 1% of first-type errors. According to the econometric model we compiled, the Fisher (F) criterion is 147.3, the calculated value of this criterion, compared with the table value, was  $147.3 \approx 7.01$  under the condition of  $\alpha=0.01$  and  $147.3 \approx 3.84$  under the condition of  $\alpha=0.05$ . Consequently, the constructed econometric model is significant.

For the analysis, the following formula is used to estimate residual autocorrelation in the studied variation series according to the Durbin-Watson (DW) criterion:

$$DW = \frac{\sum (e_i - e_{i-1})^2}{\sum e_i^2}; e_i = y_i - y_x$$

The Durbin-Watson (DW) criterion lies in the range  $0 \leq DW \leq 4$ .

If  $DW < 2$ , then the residual series has a positive autocorrelation, if  $DW > 2$ , then a negative autocorrelation. If the DW criterion is close to 4, there is a negative autocorrelation, if the DW criterion is close to 0, it indicates the presence of a positive autocorrelation. According to our calculations based on the econometric model,  $DW=0.0003$ . Consequently, the residual series has a positive autocorrelation.

Choosing an appropriate investment allocation model is a guarantee for the long-term benefits of the labor market, and strategies that do not fully consider the sectoral investment variations model are not feasible. Variance in an employment metric explained by another investment source can be measured from the absolute value of multiplying its regression coefficient by the correlation coefficient of the predictor variable.

This suggests that a single-variable analysis of the impact of investments in employment generation does not yield the best predictive results for policy recommendations. Therefore, it could be more difficult to estimate employment generation by foreign direct investment alone than by a combination of budget funds and private sector capital, leading to the observed differences between the results of the sector-specific investment models. The values  $\beta$ -coefficients represent the estimated magnitude of investment impact for the optimal value of employment generation. Note that the elasticity coefficient strongly differs across the types of investments.

As can be seen from the data in Table 1, in 2022, the volume of centralized investments amounted to 41784255.3 million soums, of which budget funds amounted to 21373320.1 million soums. Decentralized investments amounted to 224455706 million soums, where the resource of the enterprise amounted to 36.0%, the capital of the population - 12.2%, foreign direct investment and loans - forty-four%, as well as loans from commercial banks and other borrowed funds - eight% (Figure 2).

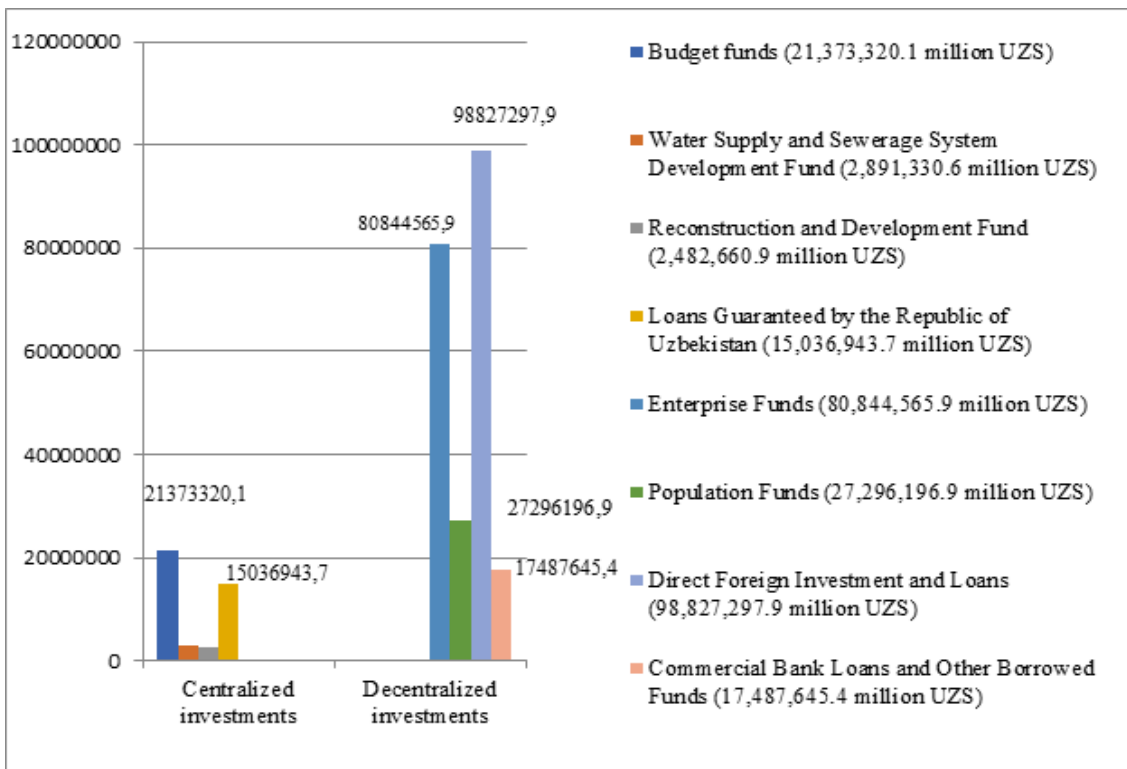


Figure 2. Investments in fixed assets in 2022 [23]

As can be seen from the data in Figure 2, the enterprise's funds and foreign direct investment and loans accounted for a large share in the investment structure.

Also, if we analyze the above investments, we can observe that the volume of investments has increased over the years.

Additionally, some industries have lower elasticity scores in specific investment categories, such as education and health services in public investment indicators, which indicates that these sectors are significantly underdeveloped in Uzbekistan, necessitating improvement through decentralized investment policies.

The results show the efficiency in using econometric modeling approaches to estimate employment outcomes and it motivates the implementation of our approach for other economic sectors. The findings emphasize the high degree of integration of investment planning and labor market policies and rely on the development of highly developed analytical tools to create conditions for the extensive assessment and optimization of capital allocation. The proposed framework will build investment efficiency models into a comprehensive system that integrates public spending, private capital, FDI, sectoral needs, and employment growth indicators. This modeling approach leads to a strong improvement of existing approaches that are based on simplistic linear investment-job relationships.

As seen in Table 2, among the selected factors, enterprise funds (X3) has the most obvious impact in developing job creation in legal entities, followed by budget funds (X1) and loans guaranteed by the Republic of Uzbekistan (X2), and loans from commercial banks and other borrowed funds (X4) has the least impact. This multifactorial econometric approach leads to a strong improvement of existing approaches that are based on single-factor investment analysis, as seen in prior studies [13, 17]. The integration of investment components will facilitate the management of capital inflows and employment policies, while also collecting extensive panel data on labor market dynamics, which will become the basis for strategic workforce planning, socioeconomic forecasting, sectoral investment allocation, and policy recommendations by government agencies and economic researchers [3, 9, 22].

The efficiency of capital allocation in different economic sectors must be first optimized, and the investment structure of the national economy then should be improved to guide decision-makers to actively channel investments and monitor job stability. Suppose  $Y_i$  is the score value of the predicted employment growth value of the regression equation,  $Y_x$  is the actual value of employment generation of the legal entity,  $X_{max}$  is the maximum value of investment inflows,  $X_{min}$  is the minimum value of capital disbursement.

With the help of the econometric model, the study integrates sectoral investment trends and establishes a correlation-based, predictive, policy-oriented, and econometric model. It can be seen that the allocation

of investment funds is of great significance to promote sustainable employment growth and create stable economic opportunities for regional labor markets. The employment-related investments are digitally monitored, analyzed, forecasted, and evaluated at the macroeconomic level, and they are especially demanding for the level of investment efficiency and financial sustainability of various enterprises [7, 12, 16]. These regional attitudes toward job creation through investment inflows are significantly influenced by economic policies and market demand elasticity, as seen previously [13, 19]. The two variables enable a clearer assessment of investment effectiveness to be obtained in different economic conditions.

As can be seen from the regression analysis, foreign direct investment (FDI) inflows has the strongest comprehensive strength in the field of manufacturing industry development, which is significantly ahead of other investment types [20, 21]. The model estimation yields an estimate of  $R^2 \approx 0.995$ , i.e. 99.5% explanatory power, which is 6.3 times as high as a standard single-variable regression model's estimate, with a standard deviation of 2.3% ([14]).

This implies that although investors perceive government-funded projects to be stable and predictable to use, their impact on job stability can entail certain problems that some industries find difficult to contend with due to labor market fluctuations, such as the need for sector-specific investment planning or adjustments to economic policies [10, 18]. The proposal of a strategic investment allocation model is an inevitable requirement for responding to the transformation of labor markets and the improvement of investment performance [5]. To the contrary, testing hypothesis H1 enabled it to be concluded that foreign direct investment (FDI) does have a significant positive effect on employment growth ([6]). This is in line with previous studies on sustainable job creation through capital inflows [15, 19].

With regard to hypothesis H2, the budget allocation–employment relationship has not been fully verified in the present research, and, consequently, the conclusions drawn in prior studies on fiscal spending and labor market fluctuations are not backed up [8]. Although our new methodology improves the estimation of investment-induced employment growth, we point out two potential sources of bias of our current approach: multicollinearity issues and sector-specific investment disparities.

With respect to the sectoral differentiation of investment impact, the results of the present study do not show any significant influence on job creation in the real estate sector. To the contrary, significant relationships are found between enterprise funds and employment growth ([20]) and between foreign direct investment and job stability ([13]). This paper formulated investment allocation strategies for employment generation based on econometric modeling, explored the role of capital inflows, sectoral variation, and policy measures of investment distribution, conducted the statistical modeling and trend analysis of job creation, proposed monitoring approaches for investment effectiveness based on quantitative assessment, analyzed the regression-based model of investment-induced employment growth and sectoral stability, and discussed the macroeconomic factors and policy formulation mechanism of employment sustainability under the background of economic transition in Uzbekistan [3, 11, 24]. The results indicate that the analyzed external variables have a direct or indirect influence on labor market trends.

## CONCLUSIONS AND SUGGESTIONS

This study provides an econometric analysis of the relationship between investments and job creation, offering valuable insights into how different types of investments influence employment growth. The findings confirm a strong positive correlation between capital inflows—such as foreign direct investment (FDI), domestic private investment, and public sector expenditures—and the expansion of new job opportunities. However, the impact varies by sector and region, emphasizing the need for targeted investment policies. The results suggest that well-structured investment strategies can significantly boost employment, particularly in labor-intensive industries and emerging markets. Policymakers should focus on creating an enabling business environment, ensuring efficient capital allocation, and fostering innovation-driven investment to maximize job creation.

Finally, further applications of the econometric investment-employment assessment approach proposed include revealing the structure of sector-specific investment effectiveness in any developing economy. It is recommended that the model be extended by the inclusion of other variables in order to increase its predictive capacity. In order to further strengthen job creation strategies in the field of employment policy, in addition to improving investment efficiency, we should speed up the development of a comprehensive labor market analysis system, build a policy framework for sustainable employment, pay attention to sectoral investment diversification and regional workforce needs, and provide policy recommendations for economic planners in Uzbekistan [9, 22]. Future work on measuring investment-induced employment growth might focus on improving the predictions by incorporating dynamic modeling techniques of capital allocation and job stability.

It should be borne in mind that all the results of this research have been obtained from a sample of investment-driven employment data located in Uzbekistan. Therefore, the corresponding caution should be

shown when extrapolating the results to other economic systems or labor markets, and aspects such as the current deployment of public investment policies, private sector contributions, the number of existing employment-generating industries, and regional economic stability should be taken into account [3, 19].

It would also be especially interesting to continue the study of the factors that impact employment sustainability by including aspects such as the long-term stability of investment returns and macroeconomic trends and labor market adaptation, assessing the effects that involvement in public-private partnerships designed to enhance workforce participation and the regional disparities of employment policies have [5, 14].

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