









“The impact of investment and social factors on pension savings in Kazakhstan”

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THE IMPACT OF INVESTMENT AND SOCIAL FACTORS ON PENSION SAVINGS IN KAZAKHSTAN

Abstract

In the current social conditions, pension systems have become the most important topic on the agenda for many countries. Therefore, governments have started paying attention and should reform their pension systems to guarantee an adequate contribution to pensions. Thus, this study analyzes the impact of investments and social factors on pension savings using Kazakhstan as an example. The paper is based on secondary data from the annual reports of the Unified Accumulative Pension Fund and annual statistical reports of the Bureau of National Statistics of the Republic of Kazakhstan from 2014 to 2022. SPSS software was used to analyze the collected data, specifically through correlation and regression analysis, to determine the impact and relationships between selected indicators (i.e., inflation rate, number of contributors, pension contribution, investment income and average wage). To check the reliability of the models, Fisher's F-test and Student's t-test were conducted. Therefore, a VIF diagnosis was conducted. The correlation analysis results showed that in the group of investment factors, pension savings are more dependent on pension contributions (900**), and in social factors, on average wages (1,000**). Based on the results obtained, all factors have a positive impact on pension savings, except inflation. Inflation growth by 1% on average reduces the amount of pension savings by 23% over the nine-year period between 2014 to 2022, which is reflected in the results of Model 2. The study's results can be applied to managing pension funds and reforms related to the pension system.

Keywords

pension savings, pension fund, investment factors, social factors, inflation, Kazakhstan

JEL Classification

E21, E27, H55

INTRODUCTION

Today, the study of the pension system is very relevant, since this problem has a pronounced social aspect. The approach to pension provision, based on the redistribution of income, is becoming a problem and an object of reform due to the emergence of several global factors that have determined the impossibility of material provision for modern pensioners by the old ways and methods.

The situation with a comprehensive assessment of the state of the pension system is much more complicated. To adequately assess and ensure the pension system's stability, it is necessary to evaluate primary pension savings. The reform processes of the pension system today have significantly expanded and are not limited to the sphere of public finance. The pension savings system depends on the state of the economy and the financial situation of the country's active population requiring analysis of pension savings in countries with transforming economic systems. Today, there is a broad discussion of pension system management, sometimes with polar proposals in the face of political and economic instability.

Retirement savings problem with falling investment returns due to low and zero central bank rates caused by Covid-19, jeopardizing the possibility of receiving pensions in the future. Investment and social factors have a significant impact on pension savings. The results of the pension fund investments or individual retirement accounts directly influence pension savings. High investment returns increase retirement savings, but low or negative returns can reduce savings. High wages allow for higher pension contributions and the supply of pension savings, while low wages can limit the possibility of pension savings. The study of the influence of social and investment factors on pension savings will provide an opportunity not only for quantitative relationships between the studied variables but also to substantiate the management actions of pension funds and the state from a scientific point of view. The problem of sufficient levels of pension savings is worldwide, and Kazakhstan is no exception.

Existing studies primarily focus on analyzing single factors rather than in a comprehensive manner, i.e., in groups. This paper attempts to cover this gap by examining the influence of social and investment factors on pension savings.

1. LITERATURE REVIEW

The influence of investment and social factors on retirement savings can be complex and depend on many variables, including economic conditions, government policies, and individual circumstances. Planning for the financial future and considering these factors can help ensure stability and adequate retirement savings.

Much research has been devoted to the study of pension savings. Some papers indicate that the decision on pension savings is crucial in making recommendations. Other studies argue that more radical steps should be taken towards a purely funded system. Thus, existing literature on pension savings mainly focuses on identifying variables that affect pension saving decisions and analyzing the correlation between pension savings and identified indicators. Behavioral economics explores people's motives and decisions to save for retirement. For example, the promised pension benefits predicted in some public pension schemes negatively influence people's decisions to save for retirement (Attanasio & Rohwedder, 2003). In addition, the context of the development of pension systems has a decisive influence on decisions about pension savings (Dahlen et al., 2010). For instance, promised pension payments decrease the motive to save for retirement as people are provided with retirement payments. They highlighted three factors such as institutional regulations, society, and psychological determinants, including personal characteristics (as planning) and financial literacy, which influence pension savings. Extant litera-

ture has been developed on the study of a positive correlation between pension fund development and market capital, as pension saving institutions are regarded as long-term investors, and various factors affecting pension savings as well (Ibiwoye & Adesona, 2011; Olgić Draženović & Kusanović, 2016; Berezina, 2017).

In addition, the decisions of individuals are influenced by the human factor. So, society or the environment of people, the working environment, regardless of whether to save for retirement, significantly affects saving behavior. Therefore, when colleagues decide to follow a particular pension saving plan or increase by making voluntary pension contributions, individuals follow their example (Gerrans et al., 2017). In the early stages, individuals are affected by their families or friends. In their study, Bongini and Cucinelli (2019) revealed that the younger generation (students) is concerned about retirement well-being and is inclined to save for retirement. Thus, students with better knowledge and understanding of financial market tools are more motivated to follow pension saving systems, while others need more interest (Bongini & Cucinelli, 2019). To conclude, financial literacy is essential in making decisions about retirement savings. Moreover, private pension contributions are highly affected by the individuals' financial literacy level (Cupák et al., 2019). If an individual lacks essential knowledge of how to employ financial instruments and basic knowledge in math, it becomes difficult to plan and project future expenses or needs. Therefore, people are not strong in planning for retirement (Hutabarat & Wijaya, 2020).

However, some papers acknowledge the presence of problems in the existing pension system and the need for further reform (Koval et al., 2020). Simultaneously, pension systems change, among which the shift in the retirement age is typical. By large, pension systems are not risk tolerant and are affected by various socio-economic factors such as inflation or mortality rate (Grishchenko, 2016; Chen et al., 2020; Baltas et al., 2022; Zaman, 2023). Inflation negatively affects many economic indicators, especially economic growth, part of which consists of pension savings. In the short term, Kazakhstan, Lithuania, and Ukraine depend on changes in inflation (Kerimov et al., 2023).

On the other hand, even negligible, guaranteed pension payments increase the number of pension contributors, with one remark that guaranteed payment is not dependent on pension system reforms or other factors (Wolf & Caridad y López del Río, 2021). Since many countries now accept a funded component that depends on a person and their income, pension savings depend on the number of contributors and their pension contributions.

Another group of factors considered in various studies is an ageing population and the change in the retirement age, which can have a negative impact on pension contributions and thus affect negatively pension savings (Liu & Sun, 2016; Lukyanets et al., 2021). A significant concern is given to the shift in the retirement age and its negative impact on the population's well-being. The average retirement age changes can positively contribute to the pension payment system management (Hagen, 2018). Nevertheless, it must be considered that there is a high risk of involuntary job loss among the older population (close to retirement age). Consequently, people live off social payments (Etgeton, 2018). At the same time, studies show similar dynamics for people with lower income and the effect of the decrease in income; for instance, in crisis periods, and are less interested in saving for retirement (Horneff et al., 2018).

An increase in the lifespan combined with the ageing population impacts the pension savings systems management and may shift the retirement age Pascual-Saez et al. (2020). Shariff et al. (2019) argue that different age groups can have positive

and negative attitudes towards pension savings. However, it is affected by the attitude of individuals to retirement in combination with their education and income level (Pilipiec et al., 2021). It must be mentioned that income level explains the size of pension contributions and is not attributed as the reason for voluntary pension contributions. An increase in income is not related to the decision of an individual to save for retirement (Vivel-Búa et al., 2019). Despite this, wages affect pension savings with a mandatory funded pension component. Nevertheless, the incomes of men and women differ from country to country.

In developing countries, mainly rural areas, the situation for women and men is different. That is, the impact of social and cultural habits prevents from saving for retirement among women based on various factors, including unemployment (Willows, 2019). For instance, taking a mortgage or early withdrawal of pension savings to cover urgent needs is possible (Agarwal et al., 2019; Lusardi, 2019). For example, in 2021, Kazakhstan has allowed the use of pension savings to buy housing, improve health, etc., which significantly increased the amount of pension payments. This function is unavailable in other post-Soviet countries (Ybrayev et al., 2023).

After gaining independence, Kazakhstan needed to carry out reforms in many areas, in particular, in the pension system. The Chilean model of pension accumulation was adopted as the basis of the pension reform, which helped to reduce the burden on the country's budget. This model was transformed and adapted to the specifics of Kazakhstan, and in 2013 the pension system underwent another reform. As a result, one accumulative pension fund remains, the founder of which is the Government of the Republic of Kazakhstan, and the National Bank of the country manages the assets (Abikenov et al., 2021).

The effectiveness and profitability of the pension system are topical issues in connection with changes in the population size. The low profitability of the Kazakh pension system was due to the global financial crisis 2008, which swept the stock markets (Zhandildin, 2015; Kangalakova & Sabden, 2017; Nazarov et al., 2022). Furthermore, according to the results of recent studies, to increase the

efficiency of the pension system in Kazakhstan, there is a need to increase the amount of pension contributions. In this case, ensuring sufficient pension savings for the future will be possible. In addition, they consider the labor market as one of the primary factors that influence the development of the pension system, since wages and other essential indicators are formed in this market (Junusbekova & Zhaumitova, 2020). Some studies based on correlation analysis have noted that the economy of Kazakhstan can be influenced by financial technologies, income, and economic growth (Kireyeva et al., 2021; Turkebayeva et al., 2022).

The conducted literature review showed that there are various factors affecting pension savings. The majority of studies are based on the methods of qualitative analysis and explain the behavior of individuals in different circumstances. Even so, existing studies primarily focus on analyzing single factors rather than in a comprehensive manner, i.e., in groups. The current study completes this gap by examining the influence of social and investment factors on mandatory pension savings.

The study aims to explore the impact of investment and social factors on pension savings using Kazakhstan as a case study. Therefore, drawing upon the existing literature discussed earlier, two hypotheses have been formulated, based on variables that are expected to influence the level of pension savings:

H_1 : *Investment factors (pension contribution and investment income) have a significant positive impact on pension savings.*

H_2 : *Social factors (inflation rate, number of contributors and average) have a significant positive impact on pension savings.*

2. RESEARCH METHODS

Based on the conducted literature review, this scientific research, according to the purpose of the study, will be carried out sequentially in three main stages. The first step is the selection of research methods, description of the selected variables and formulation of hypotheses. The description of Kazakhstan pension system components

and their differences are given since it is necessary to understand their features. In the second stage, a descriptive analysis of the studied data was carried out, which was collected from two primary data sources. Thus, data on inflation and average wages were collected from the collections of the Bureau of National Statistics of Kazakhstan, and data on pension savings, the number of contributors, investment income, and pension contributions were collected from the annual reports of UAPF JSC. This analysis covers data from 2014 to 2022. The last step of the stage is the discussion, submission of conclusions and recommendations.

UAPF JSC has been operating for the ninth year, i.e., founded in August 2013. The indicators' changes can be monitored by analyzing the secondary data for the studied period. The variables are given in Table 1.

Table 1. Description of variables

No.	Variable	Coding	Measurement
Dependent variable			
1	Pension savings	Pens_Sav	KZT
Independent variables			
2	Inflation rate	Inflation_	in percentage
3	Number of contributors	Numb_contributors	People
4	Pension contribution	Pens_Contr	KZT
5	Investment Income	Invest_Income	KZT
6	Average wage	Aver_Wage	KZT

Note: Compiled by the authors.

The correlation-regression analysis of indicators is carried out to determine their relationships. The methodological framework of the current study is based on the conducted literature review, which revealed that depending on the context of pension saving system development and functioning, different variables were selected in the studies.

Therefore, the methodology was divided into two stages: variables identification and statistical techniques employment (descriptive statistics, Correlation analysis, Variance Inflation Factor (VIF) test, and Analysis of Variance (ANOVA)).

Investment income refers to net investment income (NII). NII is the investment income credited to the individual pension accounts of contributors minus the commission fee from the UAPF pen-

sion assets and the commission fee of the National Bank of the Republic of Kazakhstan or the investment portfolio manager from the accrued investment income:

Investment factors (pension contribution and investment income) have a significant positive impact on pension savings.

Model 1. The impact of two variables, pension contribution and investment income are grouped into one group as they are investment indicators. Pension saving funds are also regarded as long-term investors, and therefore the size of pension contributions predicts the market capital and consequently affects investment income.

The model for this group of indicators is as follows:

$$Pens_sav = \alpha_0 + \beta_1 Pens_Contr_i + \beta_2 Invest_Income_i + \epsilon, \quad (1)$$

where $Pens_sav$ – pension savings, $Pens_Contr$ – pension contributions, $Invest_Income$ – Investment income, $\alpha_0, \beta_1, \beta_2$ – coefficients, ϵ – balances, i – years, from 2014 to 2022, 9 years.

Social factors (inflation rate, number of contributors and average) have a significant positive impact on pension savings.

Model 2. The literature review revealed that individuals' decision to save for retirement is conditioned to various external factors, for instance, economic crisis, social and cultural habits. However, the current study is employing secondary data. Due to this, the set of interrelated factors include inflation rate, number of contributors and average wage. The number of pension contributors or investors is highly affected by the economic situation including the inflation rate.

The model for this group of indicators is as follows:

$$Pens_sav = \sigma_0 - \varphi_1 Inflation_i + \varphi_2 Numb_contributors_i + \varphi_3 Aver_Wage_i + \Theta, \quad (2)$$

where $Pens_sav$ – pension savings, $Inflation$ – inflation, $Numb_contributors$ – number of

contributors, $Aver_Wage$ – average wage, $\sigma_0, \varphi_1, \varphi_2, \varphi_3$ – coefficients, Θ – remainders, i – years, from 2014 to 2022.

Fisher's F-test, Student's t-test and VIF tested the hypotheses' confidence level.

Multicollinearity can lead to instability in estimates and imprecise deviations, which affects the accuracy of confidence intervals and the results of hypothesis testing. If there are multiple predictors with a VIF above 10, this may indicate a collinearity problem between those predictors. Therefore, the results cannot be reliable and additional collinearity diagnostics will be carried out.

This study has the following limitations: a small number of observations takes more than twenty-five years to get reliable results. Another significant limitation is the number of contributors since not all contributors make regular contributions to their retirement accounts. However, the data shows that the number of contributors is growing, which may not explain the growth in pension savings because they may not make pension contributions.

3. RESULTS

3.1. Analysis of Kazakhstan's pension system components

Since the study is conducted on the example of Kazakhstan, it is essential to consider the features of the pension system in Kazakhstan.

The pension in Kazakhstan consists of three components: basic, mandatory, and funded. The state pays the primary and mandatory parts of the budget, and the Unified Accumulative Pension Fund (UAPF) is responsible for forming the funded component. The structure of pension system in Kazakhstan is presented in Figure 1.

The state provides fundamental pension provisions as a basic and solidarity pension financed from tax revenues to the budget. The second level includes mandatory 10% employee contributions and mandatory occupational pension contributions from employers in 5% of the income of em-

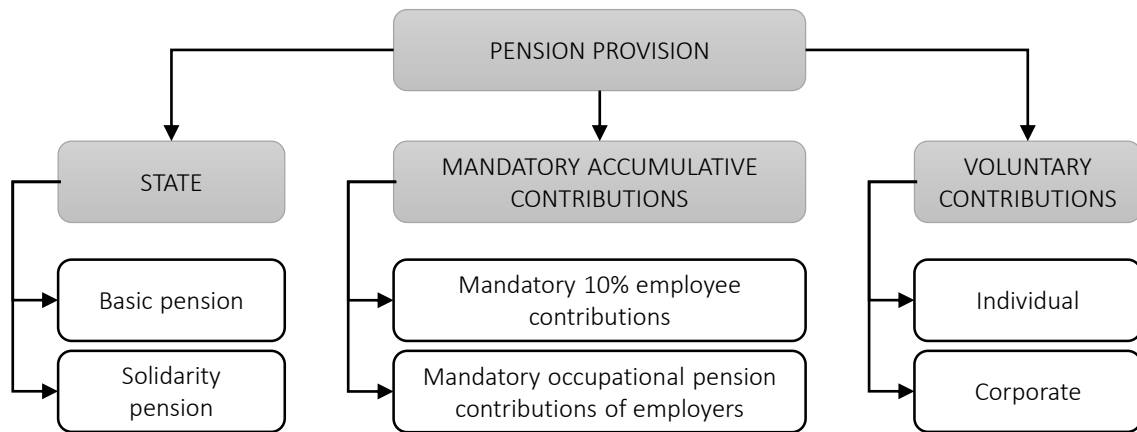


Figure 1. Levels of the pension system in Kazakhstan

employees working in hazardous working conditions. Furthermore, the third pillar consists of individual and corporate voluntary pension contributions. The last two levels are formed in the accumulative pension fund, the only one in Kazakhstan since 2014 – JSC Unified Accumulative Pension Fund. The amount of the monthly pension payment from the UAPF should not be lower than 70% of the subsistence level.

The pension in Kazakhstan consists of three components: basic, mandatory, and funded. The state pays the basic and mandatory parts of the budget, and the Unified Accumulative Pension Fund (UAPF) is responsible for forming the funded component. Each component of pensions is calculated individually and depends on various factors (Table 2).

The retirement age for women is fixed at 61 until 2028, while men retire at 63. The basic pension was introduced in Kazakhstan in 2005 to prevent poverty in old age. It is received by absolutely all Kazakhstanis who have reached retirement age. Until 2018, the basic pension was provided to all persons, pensioners by age, in the same amount. Since July 2018, the basic pension amount has been determined individually, depending on the participation period in the

pension system and the living wage. The minimum amount of the state basic pension payment is 60% of the value of LW.

Unlike the basic pension, only those citizens who have at least six months of work experience as of January 1, 1998 receive a solidarity pension. The amount of the solidarity pension depends on the length of service available on the above date, as well as on 60% of the average monthly income for any three consecutive years, regardless of interruptions in work since January 1, 1998. At the same time, the average monthly income should not exceed 46 Monthly Calculation Index for the pension year.

In addition, the solidarity pension is paid in full if the length of service as of January 1, 1998 is at least 25 years for men and at least 20 years for women. If the length of service is less, then a reduction factor adjustment is applied. If the length of service is longer, then for each year, 1% is added to the size of the solidarity pension. However, its value cannot exceed 75% of the income considered for calculating this pension payment. In the absence of the income required by law, the complete solidarity pension calculation is carried out based on the minimum pension.

Table 2. Peculiarities of pension components

Pension type	Financing	Recipients	Factor
Basic	State	Everyone who has reached retirement age	Work experience; wage
Solidarity	State	Who has an experience of at least six months before 01/01/1998	Work experience; accumulation amount from January 1, 1998
Cumulative	UAPF	Who pays mandatory pension contributions	Official income

Table 3. Statistical data on indicators from 2014 to 2022

Source: Authors based on the sources QAZSTAT (2014–2020); UAPF (2014–2022).

Year	Pension savings, in mln. KZT	Investment income, in mln. KZT	Number of contributors	Pension contribution, in mln. KZT	Inflation rate, %	Average wage, KZT
2014	4411,09	138,19	9364383	501,95	7,5	120455
2015	5643,35	632,33	9675408	590,12	14	126021
2016	6536,72	484,34	9626385	595,40	8,5	142898
2017	7525,01	495,49	9641661	646,68	7,1	150827
2018	8939,07	746,85	9844125	723,29	5,3	162673
2019	10432,66	600,53	10070672	843,94	5,4	186815
2020	12408,33	1131,50	10984130	916,27	7,5	213003
2021	13005,31	1341,31	10868712	1136,25	8,4	250311
2022	13963,87	777,13	10923675	1466,25	20,3	308985
Growth, in times	3,17	5,62	1,17	2,92	2,71	2,57

3.2. Descriptive analysis of results

It is necessary to provide a descriptive analysis of the data to understand the current situation in the pension market to overview pension savings' present reality.

In this study, only mandatory pension savings are considered. Table 3 provides analysis of the indicators from 2014 to 2022.

The studied indicators for the study period have increased. The dependent measure of retirement savings grew 3.17 times from 2014 to 2022. This is explained by the fact that the average salary in the country has also increased since mandatory pension contributions make up 10% of wages and other official income, which also increased by 257%. Moreover, pension contributions increased almost three times (2.92). The number of contributors who make mandatory pension contributions in-

creased by 17%. However, despite the high growth of indicators, they are depreciating since inflation also rose by 12.8%, from 7.5 to 20.3%.

In general, all indicators show growth dynamics. Investment income does not have growth dynamics because it depends on many factors. Nevertheless, rising inflation is not a positive indicator, and it has a negative impact on many indicators.

3.3. Correlation and regression analysis results

The research methodology includes the analysis of two models based on developed hypotheses. The first model refers to Hypothesis 1, the impact of two independent variables (Pens_Contr, Invest_Income) on pension savings (Pens_Sav). The second model refers to Hypothesis 2, the impact of three variables (Inflation_%, Numb_Contr, Aver_

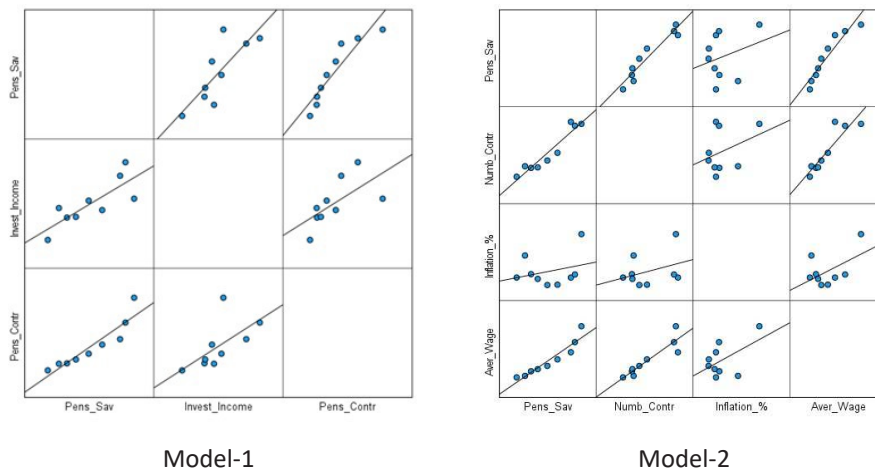


Figure 2. Independent variables normality distribution (Model 1, Model 2)

Wage) on pension savings (Pens_Sav). First, to examine the strength of the relationship between dependent and independent variables there is conducted correlation analysis and the scatterplots for both models which are presented in Figure 2.

The scatter plot for the Model 1 indicates a positive strong linear relationship between Pens_Sav and Pens_Contr and moderate linear relationship between Invest_Income and Pens_sav. There is a moderate linear relationship between Pens_Contr and Invest_Income as well. This supports that pension savings are highly dependent on pension contributions rather than investment income.

The scatter plot for the Model 2 indicates that Pens_Sav has a positive strong linear relationship with Aver_Wage and Numb_Contr. This supports that the pension savings are mostly dependent on average income and number of contributors. Thus, as the average wage and number of contributors increase pension savings increase in line. On the contrary, inflation has a weak correlation with all predictors.

To examine the relationship between indicators there was run Spearman's rank-order correlations. Table 4 presents the results for Model 1 and Model 2.

The results for the first model showed that there is a strong positive significant relationship between Pens_Sav and Invest_Income ($r_s = 82, n=9, p>,001$). There is a perfect linear correlation between Pens_Sav and Numb_Contr. The higher the investment income, the more significant the pension savings since a high investment income provides more re-

irement savings funds. There is a perfect linear correlation between pension savings and the number of contributions. Thus, the number of contributions is directly related to the amount of pension savings. The more pension contributions, the more pension savings. These results confirm the importance of investments and regular contributions for building sufficient retirement capital. The more people invest and contribute more often, the more they save for future retirement, which is essential for financial stability in old age.

The results for the second model include dependent (Pens_Sav) and three independent predictors (Inflation_%, Numb_Contr, Aver_Wage). The results showed that there is a strong positive significant relationship between Pens_Sav and Numb_Contr ($r_s = 90, n=9, p = 001$), Aver_Wage and Numb_Contr ($r_s = 90, n=9, p = 001$). Moreover, there is a perfect linear correlation between Aver_Wage and Pens_Sav. The results for inflation_% showed that there is an insignificant correlation with Pens_Sav, implying that there is no statistically significant relationship between these two variables. The greater the pension contributions and the average wage, the greater the pension savings proving that regular contributions and high salaries contribute to increasing pension savings. The average salary is directly related to the amount of pension savings. The higher the salary, the greater the pension savings. However, inflation does not have a statistically significant effect on pension savings, indicating that inflation is not the main factor affecting the pension savings level. These results highlight the importance of regular contributions and high salaries for building suf-

Table 4. Spearman's correlation

Model 1			
Indicator	Pens_Sav	Invest_Income	Numb_Contr
Pens_Sav	1		
Invest_Income	,817**	1	
Numb_Contr	1,000**	,817**	1

Model 2				
Indicator	Pens_Sav	Numb_Contr	Aver_Wage	Inflation_%
Pens_Sav	.1			
Numb_Contr	,900**	1		
Aver_Wage	1,000**	,900**	.1	
Inflation_%	.	.	.	1

Note: ** $p >,001$.

Table 5. ANOVA: F-test

Model	R	R-sqrd	Adj. R-sqrd	Std. err. estim.	F	Sig.
Hypothesis 1	,964 ^a	,930	,906	1053424867	39,596	,001 ^b
Hypothesis 2	,989 ^a	,977	,964	653892643,015	72,034	,000 ^b

Note: a. Dependent variable: Pens_Sav., b. Independent variables, Pens_Contr, Invest_Income, c. Independent variables, Inflation_%, Numb_Contr, Aver_Wage.

Table 6. Coefficients: t-test, VIF

Model	Stand. Coeff. Beta	t	Sig.	Collinearity Statistics Toler.	Collinearity Statistics VIF	
1	Predictors	,411	,695			
	Invest_Income	,364	2,594	,041	,595	1,680
	Pens_Contr	,691	4,918	,003	,595	1,680
2	Predictors	-2,279	,072			
	Numb_Contr	,392	2,298	,070	,155	6,435
	Inflation_%	-,233	-2,738	,041	,624	1,601
	Aver_Wage	,710	3,767	,013	,127	7,851

Note: a. Dependent variable: Pens_Sav.

ficient retirement capital and that inflation is not the main factor influencing the level of pension savings. These results can help manage pension savings policy and strategy.

To assess the fitness of the models, regression analysis was conducted. Table 5 is provided with a model summary of two models based on two hypotheses.

The dependent indicator Pens_Sav was regressed on predictors: (Model 1) Pens_Contr and Invest_Income; (Model 2) Inflation_%, Numb_Contr and Aver_Wage. The R-sqrd for both models indicates that the strength of the relationship of the dependent variable Pens_Sav with the first and the second groups of variables is 93% and 97,7%. Thus, this shows that both models fit well.

In Model 1, the selected independent variables explain significant changes in the dependent variable, $F(2,6) = 39,596$, $p = ,001$; in Model 2, selected independent variables explain significant changes in the dependent variable, $F(3,5) = 72,034$, $p < ,001$. Therefore, the significance value for both models is ,001, that is the p-value $< \alpha$ level (,05). Thus, there is a significant impact of both groups of indicators on the dependent variable. The results of the F-test showed that the models are significant. Both models (Model 1 and Model 2) fit the data well, as the coefficient of determination (R-squared) shows that the selected explanatory variables in each model explain 93% and 97,7%

of the variation in the dependent variable. This suggests that the models fit the data well and have high explanatory power. In both models, the selected independent variables significantly affect pension savings. This is confirmed by the results of the F-test, where the p-value for both models is less than the α significance level (0.05). This means that both groups of variables have a statistically significant effect on pension savings. These results may help understand the factors that influence the pension savings level and in developing strategies and policies in pension management. Table 6 provides results for coefficients.

The significance level for all variables Invest_Income (,041) and Pens_Contr (,003) in Model 1, Aver_Wage (,013) and Inflation_% (0,41) in Model 2 is less than α level (,05) and have a significant impact on the dependent variable Pens_Sav. Moreover, Aver_Wage (,013) and Pens_Contr (,003) show a highly significant impact on Pens_Sav.

t-test and collinearity statistics were conducted including VIF and tolerance level. The results for collinearity statistics show that the tolerance level for all variables is higher than 0,1 and the VIF is less than 10 for all variables. This supports that the multicollinearity assumption is not violated. The results of the t-test showed that the impact of the predictor Numb_Contr on the dependent variable is insignificant. The rest indicators' results showed that they significantly affect the dependent variable.

Table 7. Hypothesis testing results

Hypotheses	Regression weights	Variables	t	p-value	R-sqrd	Results
H1	Group1 – significantly positive impact – Pens_Sav	Invest_Income	2,594	,041	,930	Supported
		Pens_Contr	4,918	,003		
H2	Group 2 – significantly positive impact – Pens_Sav	Inflation_%	-2,738	,041	,930	Supported
		Aver_Wage	3,767	,013		
		Numb_Contr	2,298	,070		

Table 7 summarizes the results of hypothesis testing.

Both models showed a significant impact on pension savings. The results of the regression analysis showed that both models have a significant impact on pension savings. In Model 1, Pens_Contr and in Model 2 Aver-Wage showed a highly significant impact on pension savings as the p-values for both variables are ,003 and ,013, respectively.

To summarize, statistical studies were conducted, including tests, t-tests, and collinearity analysis, using indicators such as VIF and tolerance level. The results of the collinearity analysis show that all variables have a tolerance level above 0.1 and VIF below ten and that there is no multicollinearity. The F-test results confirm that the models are statistically significant.

The conducted study allows concluding that both models have a significant impact on pension savings.

4. DISCUSSION

The results of this study supported the hypotheses. The conducted literature review showed that many existing studies focus on identifying factors that affect pension savings. This paper employed two sets of variables in complex models to identify the relationship between pension savings and selected factors.

The results for Model 1 showed that the combination of the number of pension contributions and pension savings investment income has a significant impact on pension savings. Nevertheless, the amount of pension contributions has a highly significant impact on pension savings compared to pension savings investment income.

The results for Model 2 show a significant impact of the combination of the factors on pen-

sion savings. Inflation and average wage have significant impacts on pension savings. The impact of the average wage is highly prominent in pension systems, where individuals contribute a fixed amount of their income. The outcome for average wage and pension contributions impact on pension savings confirmed existing studies. As pension assets consist of pension contributions and investment income, which are gained through pension systems management. Additionally, reviewed literature showed that the level of income of individuals influences the decision to participate in pension plans and the amount of money invested in these financial products. For example, the acquisition of property does not significantly affect savings for retirement, depending on the income level. However, the impact of mortgages on savings can be overestimated for high-income people. Differences in the influence of various factors can be noticeable depending on income level. Moreover, people with below-average income levels during crisis periods are less concerned about retirement well-being. They are strongly interested in covering current needs. Existing studies suggest that this can be regulated through state social payments management systems (Grishchenko, 2016; Etgeton, 2018; Horneff et al., 2018; Vivel-Búa et al., 2019).

At the same time, due to inflation and the fact that the management of pension systems is unchanged, needs and costs increase, and the pension system remains fixed (Chen et al., 2020). This indirectly affects pension savings and hits the quality of life. Consequently, people are less concerned about retirement well-being. Existing papers on pension contribution discuss the impact on pension savings in the combination of income size and the impact of external factors. The impact of inflation on pension savings is considered in the context of optimal management of the accumulated capital of the pension

scheme. Where is the optimal investment of the accumulated funds of the pension fund in the financial market includes risky assets, assets associated with inflation dynamics, and a simple bank account. However, existing research focuses on the link between the number of contributors and inflation's impact on pension savings (Baltas et al., 2022). Moreover, the results confirmed that the participant's savings also depend on the investment performance of the fund's portfolio. Thus, the optimal management of pension savings is associated with choosing the optimal investment portfolio from the available financial assets. Inflation plays an essential role in maintaining the purchasing power of savings, and the impact of the death of members of the pension fund is also considered since, in the event of the death of a member, its beneficiaries are compensated with a certain amount proportional to the current level of savings. This supports the results of the current study that in the comprehensive approach, inflation, average wage, and number of contributors have a significant impact on pension savings. On the other hand, individually observed indicators have different levels of impact on pension savings.

The results for the number of pension contributors have an insignificant impact on pension savings as an individual factor. Existing studies discussed the factors that had an impact on the decision of individuals to save for retirement. The results showed that people with low income are more concerned about their retirement, and they are more focused on pension savings. First, due to the incentives they get as bank loans, commercial credits etc. (Agarwal et al., 2019; Lusardi, 2019). Secondly, they are concerned about their retirement as the current quality of life does not allow to save or invest due to external factors such as inflation or job loss. However, they did not focus their attention on the link between the size of the pension contribution and the number of pension contributors. According to this study, the number of pension contributors have an insignificant impact on pension savings, as based on existing literature the pension contribution is more commonly provided by low-income population.

However, existing literature does not consider the complex effect of current variables or more indicators.

CONCLUSION

The study aims to explore the impact of investments (investment income, pension contribution) and social factors (inflation rate, number of contributors, and average wage) on pension savings using Kazakhstan as a case study.

Based on the results, the following conclusions are developed. First, pension savings depend highly on pension contributions in Model 1 and the average wage of individuals in Model 2. The size of the income of individuals affects the number of contributors and pension contributions and consequently affects pension savings. Secondly, investment income and inflation rates independently affect pension savings. Thus, they are a moderate correlation with the rest predictors.

The findings are supported by existing studies and show that economic instability strongly affects pension savings. The indicators, such as inflation rate and investment income, are less regulated by governments and are more dependent on market development. The result showed a strong interdependence between indicators, making them more manageable compared to the inflation rate or investment income.

Therefore, governments should focus on improving pension savings by employing manageable indicators through improving the pension system and conditions for improving pension contributions. In addition, it is necessary to improve the financial well-being of the population by raising the minimum indicators of social security, such as the minimum wage and the living wage, which must comply with international standards.

In the future, it is recommended to research voluntary pension savings to increase the share of this component since this component will be an additional factor in improving the population's well-being at retirement age.

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