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SOCIAL RISK MANAGEMENT AND FINANCIAL- STATISTICAL ANALYSIS OF COSTS

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Abstract

Evidence from industrialised nations indicates that governmental investments in social risk management substantially influence residents' quality of life. This study examines the segment of state spending allocated for social risk management. Social dangers emerge from the influence on metrics that define the level of living. To attain a favourable outcome in risk management, it is essential to identify risks, ascertain which indicators were not met, analyse the causes that triggered risk-generating factors, evaluate the degree of risk, and identify potential minimisation tools and management entities: the state or individuals. The objective of the study is to elucidate the relationship between the state's social policy expenditures and the quality of life of its residents through financial and statistical analysis. Data from the state budget regarding resources designated for social program financing, along with essential indices of living standards, like average wages, employment rates, and access to social services, are utilised.

The findings indicate that significant government expenditure on social risk management is directly correlated with enhancements in quality of life.

Augmented expenditure, particularly in social assistance, healthcare, and education, is favourably correlated with socio-economic variables, resulting in heightened income levels, job creation, and enhanced health quality.

Keywords: *Existence, financial and statistical analysis, Government expenditure, societal hazards*

1. Introduction

A significant difficulty confronting contemporary states is the assurance of social security for the populace. Social dangers, including poverty, unemployment, inadequate pension pro-

vision, health issues, and housing shortages, consistently impact people' quality of life and the sustainability of governmental institutions. Under these circumstances, the state's proactive involvement in social policy becomes criti-

cally significant. In the context of globalisation, demographic shifts, and economic instability, addressing societal risks cannot be achieved solely at the individual level. Consequently, it is imperative to develop a state strategy that guarantees the detection, prevention, and mitigation of risks. Efficient management of social hazards establishes the foundation for sustainable growth, social equity, and civil stability.

The matter of social risk management is very pertinent in Georgia. Economic challenges, geographical inequalities, and demographic changes necessitate robust and efficient governmental involvement. It is essential to evaluate current procedures, exchange international experiences, and identify future development potential for the system.

This study aims to deliver a theoretical and practical examination of social risk management in Georgia. The essay examines the nature of social risks, the state's role in their management, and the existing political and institutional frameworks. Social hazards are defined as occurrences or circumstances that adversely affect the social conditions of an individual or group, necessitating a governmental reaction. Social risks may manifest as either individual or systemic phenomena. Personal risks encompass unemployment or health issues, whereas systemic risks may arise from an economic downturn, pandemic, or demographic shifts.

Social hazards possess not just an economic dimension but also impact human dignity and social integration, serving as a pivotal element in the state's social risk management framework. The existence and efficacy of the social security system are intrinsically linked to the state's capacity to redistribute resources, establish mechanisms of subsidy and solidarity, and guarantee equitable access for citizens to fundamental social services.

2. Literature review

The influence of governmental expenditure on social risk management on living standards is assessed through economic, social, and health-related expenses. Researchers examining social risk management establish a correlation between public expenditure on management and quality of life. Enhancing quality of life necessitates investment in education and

healthcare, both of which are intrinsically connected to work. Investment in education and health increases individual and societal output, resulting in enhanced living standards over time (Becker, 1993). This perspective contends that mitigating societal hazards cannot solely rely on interventionist measures; rather, it necessitates preventive public expenditure focused on augmenting human potential.

We conduct a review of theoretical principles from complex science and dynamic systems, and we formulate generalisations of existing frameworks for policy analysis and evaluation of the outcomes of proposed policy solutions to more effectively identify and contextualise instances of transformative change. The term "risk-opportunity analysis" refers to a broad methodology of which traditional economic cost-benefit analysis is a specific instance, as noted by Jean-Francois Mercure et al. (2021). This methodology is warranted in nations with a risk management ethos and facilitates an examination of the opportunities that emerge from risk events.

In contemporary economies, a substantial share of systemic risk is indirectly shouldered by taxpayers via the government, which is accountable for the liabilities. The risk associated with these liabilities fluctuates systematically with macroeconomic conditions (Samuel G. Hanson et al., 2018).

Theory of the welfare state posits that welfare programs enhance economic stability and social equality, consequently improving living standards. Esping-Andersen (1990) posits that social policy functions not merely as a tool for income redistribution, but also establishes social security, mitigates inequality, and guarantees economic stability. In this framework, social expenditure is regarded not as a fiscal burden, but as an investment in social capital. The allocation and organisation of state expenditures must be customised to societal requirements; only then can the state's social policy be regarded as a vehicle for fostering well-being. Buchanan and Tullock (1962) asserted that inefficient social programs may exacerbate budget deficits and diminish the tangible advantages of social policies. Multiple studies indicate that the expenses borne by the state for social risk management necessitate empirical calculations to achieve the anticipated outcomes.

Marmot et al. (2008) demonstrate that nations that significantly engage in social programs exhibit reduced income disparity, along with elevated living standards. Wagstaff (2002) demonstrated a robust association between public health expenditure and enhanced health outcomes, which directly influence individuals' quality of life. Social risks and quality of life are interrelated and exhibit multicollinearity with work. For example, OECD, 2015 Evidence indicates that governmental investment in training and job services diminishes unemployment and enhances economic production. Numerous studies highlight a favourable correlation between government expenditure and living standards; nonetheless, Tullock (1965) contends that not all government spending yields equivalent efficacy. He contends that suboptimal resource allocation can diminish potential advantages. We concur with the perspectives of scientists and assert that neither stringent nor lenient policies in developing nations will assist society.

Glonti V. et al. (2023) assert that an excessively centralised social policy approach, which assigns complete responsibility to the state, diminishes individual and private sector engagement, hence constraining the policy's efficacy. This trend is similarly evident in Georgia, where social risk management tends to be reactive rather than grounded on long-term forecasts. The efficacy of the state is assessed by its promptness and competence in identifying and addressing social risks. Effective social policy fosters a sustainable public environment, mitigates social disparity, and enhances citizens' trust in governmental institutions. A review of the literature indicates that the efficient management of social risks relies not only on the magnitude of expenditures but also on their composition and targeting. Investments in education, healthcare, and social protection provide varying socio-economic impacts, which are particularly significant when evaluating the level of life. Consequently, contemporary research extensively employs financial-statistical and econometric methodologies, enabling quantitative evaluation of the influence of public expenditure on quality of life metrics.

The current literature affirms that public expenditure on social risk management

is a crucial instrument for enhancing living standards, albeit its efficacy is contingent upon the institutional framework, expenditure composition, and economic conditions. The previously indicated theoretical and empirical methodologies underpin the current study, which evaluates the effect of social expenditure on living standards through financial-statistical analysis.

3. Methodology and Data

The current literature affirms that public expenditure on social risk management is a crucial instrument for enhancing living standards, albeit its efficacy is contingent upon the institutional framework, expenditure composition, and economic conditions. The previously indicated theoretical and empirical methodologies underpin the current study, which evaluates the effect of social expenditure on living standards through financial-statistical analysis.

There exists a state pension for the elderly, as well as non-state pension systems established by insurance firms and various organisations. A paid pension system has been established from 2019, designed to enhance the financial well-being of citizens in their later years. The funded pension system has been in operation for six years; nonetheless, it continues to face several obstacles regarding its efficiency, transparency, and the establishment of an inclusive culture.

A universal health care scheme has been operational since 2013, providing the people with access to essential medical services. The program has enhanced healthcare accessibility; nonetheless, issues about treatment quality, regional inequities, and financial challenges in managing chronic or complex conditions persist.

As of 2023, the outcomes of Georgia's social policy indicated that pension financing constituted almost 24.5% of the budget. The average pension amount rose, however the real increase relative to inflation was minimal. Targeted social support encompassed nearly 600,000 beneficiaries, including children and individuals with impairments.

Social expenditure constituted roughly 7–9% of GDP. The assessment involved a comparison with the index in OECD countries, where it averages 20–23% (Table 1).

Table 1. Social expenditure aggregates (as a percentage of GDP)

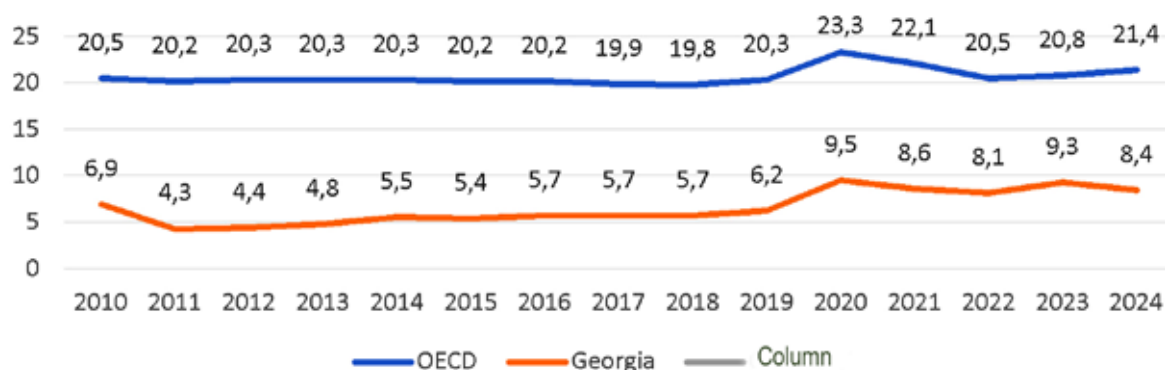
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
OECD	20.5	20.2	20.3	20.3	20.3	20.2	20.2	19.9	19.8	20.3	23.3	22.1	20.5	20.8	21.2
Georgia	6.9	4.3	4.4	4.8	5.5	5.4	5.7	5.7	5.7	6.2	9.5	8.6	8.1	9.3	8.4

Source: OECD Statistics; Geostat.ge; System of National Accounts (SNA)

Data indicate that Georgia’s social spending rate is progressive, however it constitutes approximately 30% of the rate observed

in wealthy nations. The disparity is vividly shown in Figure 1.

Figure 1. Share of Social Expenditure in GDP (%): OECD and Georgia



Source: Built by the author, OECD Statistics; Geostat.ge; System of National Accounts (SNA)

The escalation of public expenditures in social sectors by various states, including Georgia, during 2019–2020 is attributable to the Covid epidemic. Therefore, the rise is not regarded to maintain living standards. Consequently, social expenditure in Georgia does not enhance social welfare; instead, it perpetuates the existing conditions. The diagram illustrates that social policy was sustainable for nearly eight years, and since 2020, the rise in national expenditure, coupled with the pandemic, correlates with the implementation of a funded pension system, wherein the state augmented pension contributions of employed citizens by an additional 2%. Universal medical insurance, funded by the state’s social expenditure, aims to achieve a short-term systematic impact. Contributions to the funded pension system will enhance long-term quality of life. This effect will come approximately after 20–25 years. The objective of the contributions should be to enhance the standard of living.

The standard of life denotes the economic, social, and physical conditions of the populace. The subsequent indicators are frequently utilised in Georgia:

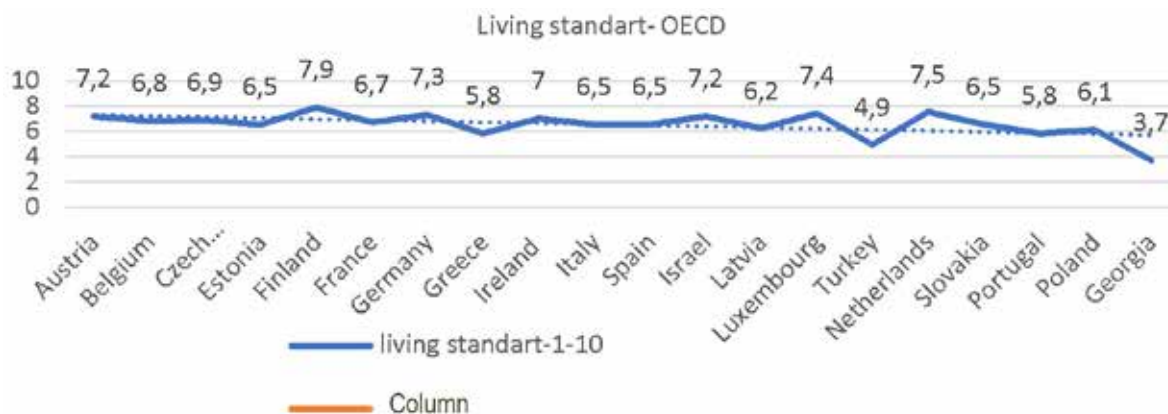
In 2023, the average monthly income per capita was roughly 450 GEL for individuals below the poverty line and above 1,500 GEL on average.

- Approximately 17% of the overall population resides below the poverty line, as shown by the banking poverty metric, which suggests a figure of 21%;
- The official unemployment rate is roughly 17%, while the actual amount is higher due to unregistered work;
- Life expectancy averages 74 years, though it differs by area;
- Educational attainment and healthcare accessibility have markedly improved with the initiation of the universal healthcare program.

Georgia is classified as a middle-income country. Social data suggest it is better positioned than several post-Soviet nations (Armenia, Azerbaijan), however it remains inferior to EU member states and OECD countries.

The poverty rate in Georgia is 17%, double the EU average of 8%; Georgia frequently occupies a median position in global quality of life rankings, as per data from Numbeo, the World Bank, and UNDP.

Figure 2. Standard of Living: Foreign Countries and Georgia



Source: Built by the author, Life Satisfaction, <https://www.oecdbetterlifeindex.org/topics/life-satisfaction>

Georgia is classified as a middle-income country. Social data suggest it is in a more favourable situation than several post-Soviet nations (Armenia, Azerbaijan), however it remains below EU member states and OECD countries.

The poverty rate in Georgia is 17%, double the EU average of 8%; Georgia frequently occupies a median position in global quality of life rankings, as per data from Numbeo, the World Bank, and UNDP.

To attain the objective, a financial-statistical examination of indicators influencing the level of living is essential. Assessing the standard of life cannot be accomplished through a singular quantitative measure, as it is influenced by numerous aspects, including income, expenditures, educational attainment, and health quality. The authors employed GDP per capita in their analysis to evaluate the standard of living. This indicator represents the allocation of state

expenditures among the populace to enhance living circumstances. The impact relies on the appropriate allocation of income by individuals aimed at enhancing living conditions, hence directly facilitating the mitigation of social hazards at the individual level.

A potential endogeneity issue arises because government social expenditures are a component of national accounts and therefore may be mechanically related to GDP per capita. To mitigate this problem, the analysis should be interpreted as examining the statistical association between public expenditure and living standards rather than establishing strict causal relationships. The results therefore reflect correlations within the macroeconomic structure rather than direct welfare causality.

Consequently, the standard of living, regarded as a dependent variable in the financial-statistical study, was assessed based on GDP per capita (Table 2).

Table 2. Statistical Data, 2008–2024

Year	GDP per capita (USD)	Social Protection (USD million)	Health (USD million)	Housing and communal services (USD million)
	<i>y</i>	<i>X1</i>	<i>X2</i>	<i>X3</i>
2002	393.31	136.41	27.21	25.85

Year	GDP per capita (USD)	Social Protection (USD million)	Health (USD million)	Housing and communal services (USD million)
	<i>y</i>	<i>X1</i>	<i>X2</i>	<i>X3</i>
2003	486.74	165.06	14.21	28.91
2004	715.06	261.86	52.27	77.09
2005	916.48	350.06	113.91	146.55
2006	1 164.86	402.74	131.77	261.74
2007	1 655.56	402.23	198.43	312.45
2008	3326.16	737.60	189.20	31.40
2009	3326.16	735.10	195.00	1.35
2010	3073.00	710.10	230.50	13.10
2011	3843.67	851.70	213.20	20.80
2012	4249.77	926.70	219.80	30.80
2013	4341.40	1068.70	283.10	22.20
2014	4438.29	1208.20	362.70	30.20
2015	3754.92	964.10	371.70	21.00
2016	3857.25	823.80	372.10	19.40
2017	4046.81	856.20	411.60	8.91
2018	4345.52	1010.80	427.50	9.50
2019	4763.50	1045.30	416.80	32.80
2020	4274.60	1362.80	551.90	35.10
2021	5015.30	1436.40	817.60	86.20
2022	6731.20	1715.30	754.70	126.40
2023	8284.00	2139.90	638.00	126.70
2024	9141.40	2342.20	644.00	164.80

Source: National Statistics Office of Georgia (Geostat), Geostat.ge.

4. Results and Discussion

Financial-statistical analysis.

The dependent variable is the standard of life, represented as GDP per capita (Y).

The independent factors influencing the level of life are:

1. *X1* – social security expenditure;
2. *X2* – health care expenditure;
3. *X3* – housing and municipal services.

The graphs created to assess the stationarity of the time series indicated a lack of pronounced stationarity. The stationarity of *X2*-health care expenditure is quite high, whereas housing and communal services expenditure is markedly non-stationary. This is comprehensible, as expenditure is not contingent upon a set timeframe.

The series of the Y-dependent variable and *X1*-social security spending, maintains stationarity partially, since they are not characterized by a trend and seasonality (Fig. 1, 2, 3, 4).

Logarithmic transformation was applied to stabilise the variance of the variables and reduce heteroskedasticity in the time series. However, stationarity of the series was tested separately using the Augmented Dickey–Fuller (ADF) test. Logarithmic transformation itself does not guarantee stationarity; therefore, differencing procedures were applied when necessary to achieve stationary series. This technique generates fresh time series data, with each indication represented as the logarithm of its value.

Figure 1.

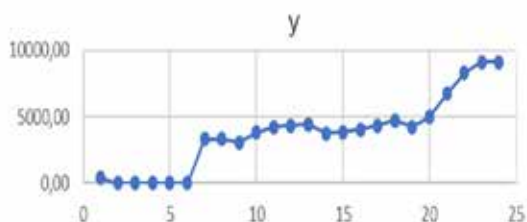


Figure 2.

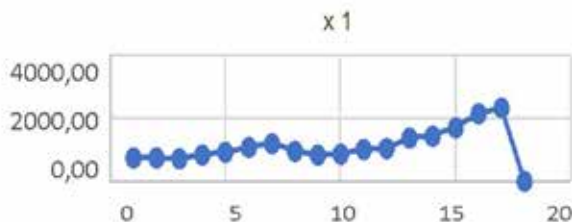


Figure 3.

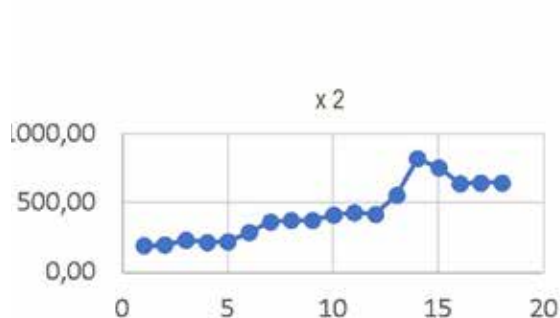


Figure 4.

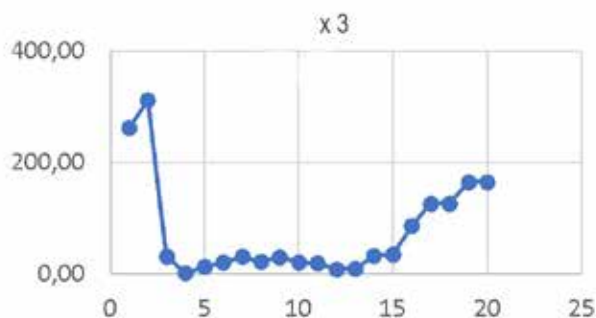


Table 3. Data Transformation into Logarithmic Values

Year	GDP per capita (USD)	Social Protection (USD million)	Health (USD million)	Housing and communal services (USD million)
	<i>y</i>	<i>X1</i>	<i>X2</i>	<i>X3</i>
2002	2.594735	2.134846	1.436322	1.412293
2003	2.687297	2.217642	1.152594	1.461048
2004	2.854342	2.418069	1.718253	1.886998
2005	2.962123	2.544142	2.056562	2.165986
2006	3.066274	2.605025	2.119817	2.41787
2007	3.218945	2.604474	2.297607	2.494781
2008	3.521943	2.867821	2.276921	1.49693
2009	3.521943	2.866346	2.290035	0.130334
2010	3.487563	2.85132	2.362671	1.117271
2011	3.584746	2.930287	2.328787	1.318063
2012	3.628365	2.966939	2.342028	1.488551
2013	3.63763	3.028856	2.45194	1.346353
2014	3.647216	3.082139	2.559548	1.480007
2015	3.574601	2.984122	2.570193	1.322219
2016	3.586278	2.915822	2.57066	1.287802
2017	3.607113	2.932575	2.614475	0.949878
2018	3.638042	3.004665	2.630936	0.977724
2019	3.677926	3.019241	2.619928	1.515874
2020	3.630895	3.134432	2.74186	1.545307
2021	3.700297	3.157275	2.912541	1.935507

Year	GDP per capita (USD)	Social Protection (USD million)	Health (USD million)	Housing and communal services (USD million)
	<i>y</i>	<i>X1</i>	<i>X2</i>	<i>X3</i>
2022	3.828092	3.23434	2.877774	2.101747
2023	3.918245	3.330393	2.804821	2.102777
2024	3.961013	3.369624	2.808886	2.216957

To ensure the study’s validity, time series were analysed utilising descriptive statistics utilising the Eviews software.

Table 4. Descriptive Statistics

	<i>Y</i>	<i>X1</i>	<i>X2</i>	<i>X3</i>
Mean	3.458071	2.878278	2.371529	1.572708
Median	3.586278	2.932575	2.451940	1.488551
Maximum	3.961013	3.369624	2.912541	2.494781
Minimum	2.594735	2.134846	1.152594	0.130334
Std. Dev.	0.375729	0.323718	0.444547	0.542561
Skewness	-1.033056	-0.768993	-1.260676	-0.402240
Kurtosis	3.024308	3.003421	4.169830	3.498180
Jarque-Bera	4.091515	2.266852	7.403812	0.858063
Probability	0.129282	0.321928	0.024676	0.651139
Sum	79.53562	66.20040	54.54516	36.17228
Sum Sq. Dev.	3.105797	2.305451	4.347681	6.476196
Observations	23	23	23	23

The standard deviation is a crucial measure of data variability. The low standard deviations of the specified variables suggest minimal variation among the data points and the mean value.

The Kurtosis value exceeds 3 for all variables, except for health care expenses (4.169830), indicating that the distribution of health care expenses in the Georgian economy deviates from normal distribution and suggests issues in safeguarding the population against social risks. The Jarque-Bera test data corroborate this issue, indicating that the distribution of health care expenses deviates from normality. The Jarque-Bera test results for the other variables indicate a normal distribution.

To assess the validity of the data concerning the selected characteristics and their influence on the population’s level of living, the following assumptions were established:

H0: Social security expenditure has no impact on the standard of living;

H0: Healthcare expenditure does not influence the level of living;

H0: Housing and communal expenditures do not influence the standard of living;

A regression model was constructed to derive the study’s results:

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

The regression results indicate that social protection expenditure (X_1) has a statistically significant positive relationship with GDP per capita. Health expenditure (X_2) does not appear to be statistically significant, while housing expenditure (X_3) shows a negative coefficient. These findings should be interpreted cautiously due to possible structural relationships between fiscal expenditure and macroeconomic aggregates.

The subsequent results were derived from the assessment of stationarity utilising the Dickey-Fuller test:

Table 5. *Aygmented Dickey-Fuller test statistic*

Aygmented Dickey-Fuller test statistic – 5% level						
variables	t staistic	t critical	Prob.	Schvarz crit.	Durbin-Watso crit.	F statistic
Y(2)	3.0914	-3.0123	0.0428	-1.9819	1.9000	9.5570
X(1,2)	4.0296	-3.0123	0.0059	-1.9567	1.8939	16,2383
X(2,(-1),2)	4.8202	-3.0206	0.0011	-2.0085	2.3642	14.7511
X (3,2)	3.9901	-3.0123	0.0064	1.6588	1.9246	15.92.15

The coefficient data indicates that the t statistic for all variables exceeds the t critical value, while simultaneously demonstrating Prob. < 0.05 at the 5% significance level, so affirming the stationarity of the series. Fur-

thermore, the F statistic significantly exceeds the crucial value of 2.71, providing additional grounds for rejecting the null hypothesis (H0).

Table 6.

Dependent Variable: Y Method: Least Squares Date: 07/1 5/25 Time: 16:55 Sam pie: 2002 2024 Included observations: 23				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	1.036062	0.121777	8.507833	0.0000
X2	0.080923	0.088783	0.911471	0.3735
X3	-0.075133	0.023942	-3.138127	0.0054
C	0.402244	0.174678	2.302778	0.0328
R-squared	0.977750	Mean dependent var		3.458071
Adjusted R-squared	0.974237	S.D. dependent var		0.375729
S.E. of regression	0.060308	Akaike info criterion		-2.621 923
Sum squared resid	0.069105	Schwarz criterion		-2.424446
Log likelihood	34.1 5211	Hannan-Quinin criter.		-2.572258
F-statistic	278.3077	Durbin-Watson stat		1.507602
Prob (F-statistic)	0.000000			

The parameters derived from the regression model assessment via the least squares approach indicate that two independent coefficients (X_1, X_2), pertaining to social and health care expenses, positively influence the standard of living and achieve a statistical significance of 97%. What accounts for the negative correlation between expenditure on housing and communal services?

Expenditures on housing and communal services by the state can adversely affect the

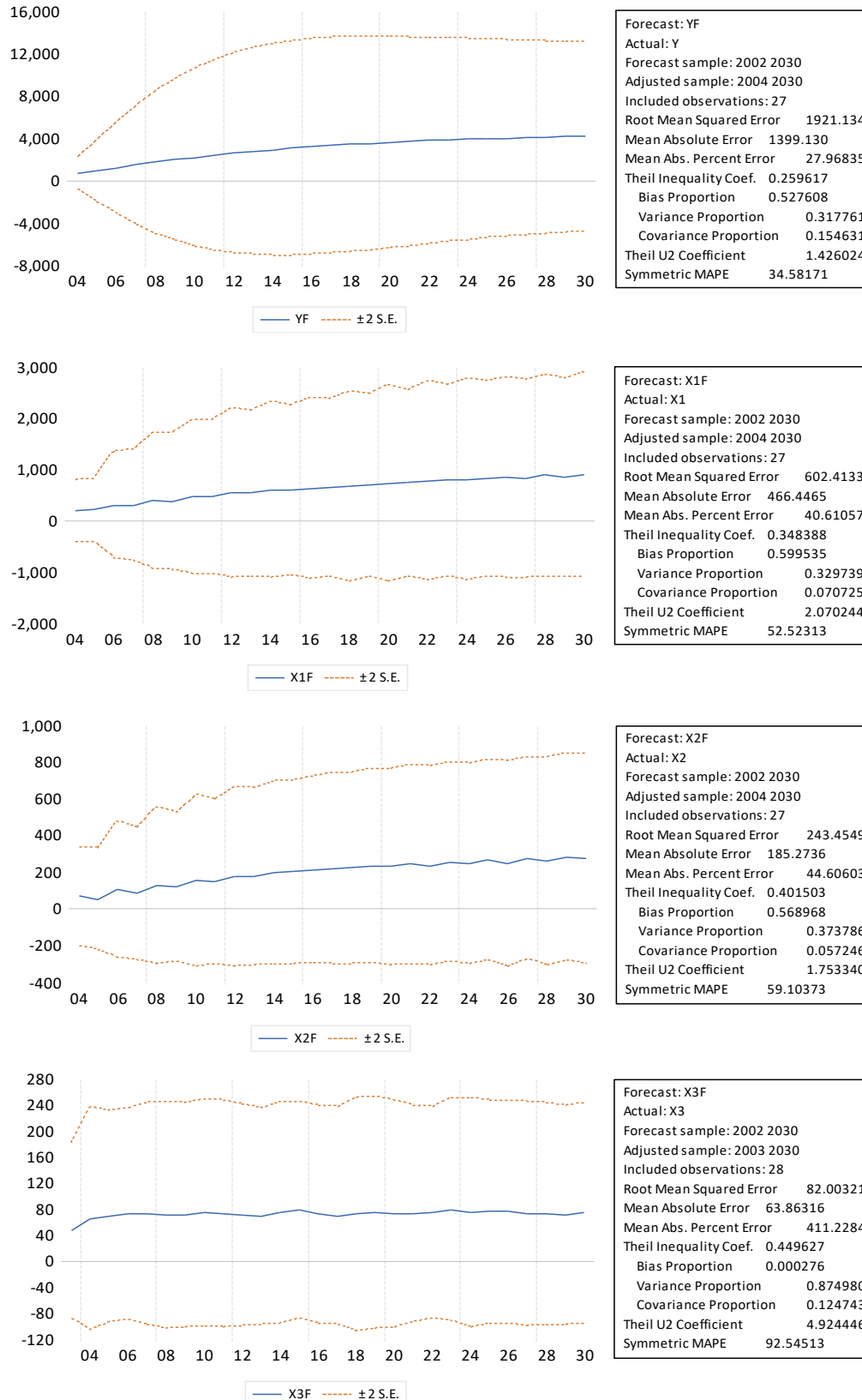
level of living by elevating primary prices, exerting strain on the budget, contributing to excessive inflation, and hindering the enhancement and utilisation of services. Together, these factors foster an atmosphere that diminishes poverty and enhances the population’s quality of life. The regression analysis data indicates that the equation is structured as follows:

$$Y = \beta_0 + 1.036062X_1 + 0.080923X_2 - 0.075133X_3 + \varepsilon$$

χ_1 (coefficient = 1.036, $p < 0.001$)
 Highly consequential. When χ_1 grows by one unit, Y increases by around ~1.04 units

on average. This is the most significant explanatory variable in the model;
 χ_2 (coefficient = 0.081, $p = 0.3735$)

Figure 4.



Statistically insignificant ($p > 0.05$). The influence of X_2 on Y falls within the realm of randomness and cannot be deemed dependable;

X_3 (coefficient = -0.075 , $p = 0.0054$)

Statistically significant and negatively related. When X_3 increases by one, Y decreases by ~ 0.075 units on average.

The forecasting procedure was conducted using the Box–Jenkins methodology. The model selection process included identification, estimation and diagnostic stages. Autocorrelation (ACF) and partial autocorrelation (PACF) functions were analysed to determine the appropriate autoregressive and moving average structure. Based on these diagnostics, the ARIMA(1,1,0) specification was selected as the most parsimonious model. Residual diagnostics confirmed the absence of significant autocorrelation, indicating that the model adequately captured the dynamics of the series. Forecast intervals were also calculated to account for uncertainty in future projections.

One limitation of the study is the relatively small number of observations available for time-series estimation. The ARIMA model was estimated using annual data, which restricts the statistical power of the results. Therefore, the forecasts should be interpreted with caution and primarily as indicative trends rather than precise predictions.

The trend indicates stable growth, although the forecast depends on economic dynamics and changes in social policy. It is recommended to review the structure of social spending to increase efficiency.

5. Discussion and Conclusion

The empirical results highlight the importance of social protection expenditure in improving living standards. The positive association between social protection spending and GDP per capita supports the argument that targeted social policies can contribute to economic welfare.

At the same time, the results suggest that the effectiveness of different types of social spending varies significantly. Healthcare and housing expenditures may produce long-term benefits that are not fully captured by short-term macroeconomic indicators.

Another important consideration is the structural relationship between government spending and national income. Since government expenditures are part of GDP calculations, some correlation between these variables is unavoidable. Future research may address this issue by using alternative welfare indicators such as poverty rates, inequality indices or household income.

The financial-statistical analysis conducted in this study suggests that public social expenditure is statistically associated with the dynamics of living standards in Georgia.

The empirical results indicate that social protection expenditure demonstrates the strongest positive relationship with GDP per capita. Healthcare expenditure does not appear statistically significant in the regression model, while housing expenditure shows a negative association.

Time-series forecasting using the ARIMA model suggests a moderate increase in social expenditure in the coming years. However, the reliability of the forecast is limited by the relatively small number of observations available for estimation.

Overall, the findings highlight the importance of effective allocation of social spending in improving living standards. Policymakers should therefore focus not only on increasing the volume of social expenditure but also on improving its efficiency and targeting.

Future research may extend the analysis by incorporating additional social indicators and applying more advanced econometric techniques to address potential endogeneity issues.

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